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BUILDING TYPES STUDY: SCHOOLS  
ARCHITECTURAL ENGINEERING: SKYLIGHTS FOR AMBIENCE AND UTILITY  
SEMI-ANNUAL INDEX ON PAGES 219-222 AND FULL CONTENTS ON PAGES 10 AND 11

# ARCHITECTURAL RECORD

JUNE 1979

6

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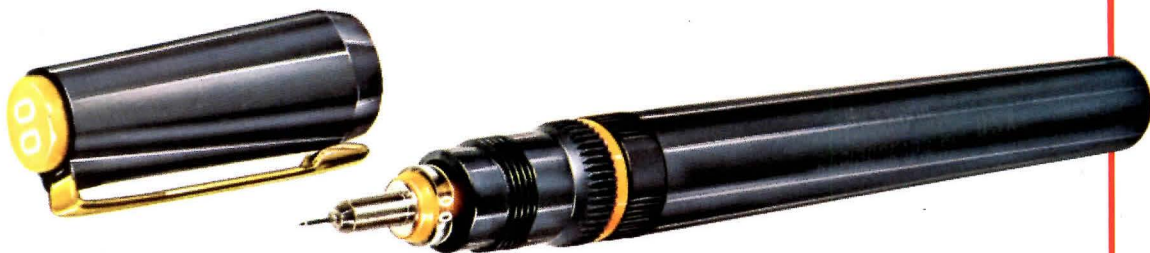
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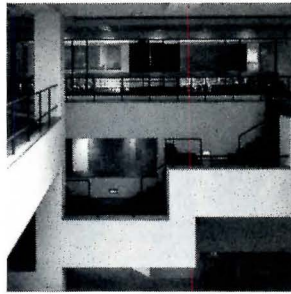
Your March 1979 issue was, as usual,

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JUNE

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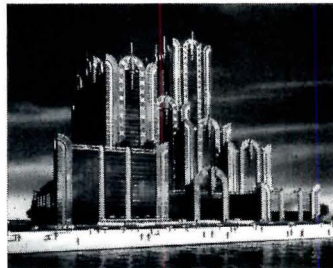
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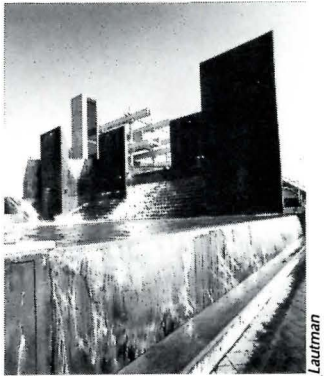
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Lautman

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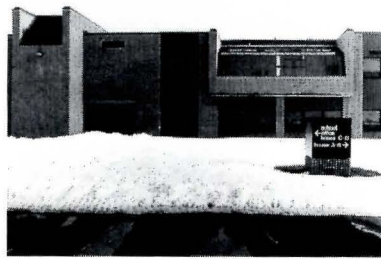
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In spite of continuing reports that the student population is declining, schools still represent a lively segment of the construction industry today, having increased in dollar value in 1978 and promising to increase further in 1979, giving form to current ideas about educational theory. Refinement, rather than revolution, seems to be the key to these ideas, resulting in buildings that are solid but up-to-date, workable but also innovative.

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**NEXT MONTH IN RECORD**

**Building Types Study:  
Transportation facilities**

In July, RECORD will focus on the key issue of mass transportation in the U.S. More than any of the active design and construction areas today, transit facilities as a building type has been lumbering along at its own pace, often under-rated in importance, with great fanfare only at the completion of a single station. There is, however, some kind of transit work going on in almost every major city and in many smaller ones, each with architect involvement. As to be expected, there is a tremendous variety of work—from train stations to subway stations to transit malls to maintenance buildings to bus systems—predominantly funded by the Urban Mass Transit Association. The newest concepts in transit design will be explored and each area of work will be represented.



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## Now is a good time for all good architects to submit your work for any of three upcoming issues of RECORD

There are days when all of us around RECORD's offices would give a lot if only the mail would stop. We have a plane to catch tomorrow at eight, or an article that's turning out to be especially hard to write, or a calendar full of appointments—and then find the incoming mail box stacked two feet high. We know that many of these envelopes contain news releases of events really outside our scope of interest, and at least one from a graduate student who wants us to do his research for him. But we plunge into the pile nonetheless—because like diamond miners we are always hoping that the next envelope will contain a manuscript like Fritz Gutheim's "Livable Winter City" (RECORD, February 1979, pages 111-116) or a project that is both beautifully designed and socially important (such as Lou Sauer's extraordinary urban park shown on page 107 of this issue) or strong signs of a whole new thought-provoking direction for an established firm (like the material you'll see in next month's issue from the long-established C. F. Murphy firm in Chicago)—or best yet, a strikingly handsome design from a young new firm that we've not heard of before.

While the editors of RECORD traveled, collectively, the better part of a quarter of a million miles last year in search of material to present to you, we do count on material being submitted to us. Submissions of any kind are always welcome—we study them, argue over them, and, often, we publish them. We sometimes hang on to them too long—in hopes of finding a spot in our pages; but eventually we do return material we can't use. But beyond this. . .

There are always two issues for which we actively solicit submissions: and please consider this editorial a special invitation:

### **The editors now invite submissions for Record Interiors and Record Houses 1980. . .**

. . .the best architect-designed interiors of the year, and the 20 best architect-designed houses (plus low-rise multi-family housing) as chosen by the editors of RECORD. Both award programs are, to be official about it, "open to any architect registered in the U.S. or Canada, and submissions of unpublished work will be welcome for RECORD INTERIORS (which will be published in January 1980) until September 15th, 1979 and for RECORD HOUSES AND APARTMENTS (mid-May 1980) until October 15th, 1979. No formal presentation requirements are made, though materials submitted should

include plan(s), photographs, and a general description of the project. Submissions will be returned, but not before date of publication. We especially solicit and welcome the work of young and/or previously unpublished architects for these two prestigious award programs." Submissions should be mailed to (and any questions addressed to) Charles K. Hoyt (212/997-6319) for Record Interiors, and Barclay F. Gordon (212/997-2334) for Record Houses. The address for Architectural Record is 1221 Avenue of the Americas, New York, N.Y. 10020.

### **This year we are also inviting submissions of work by young architects or architectural graduates for our December issue on the ideas and ideals that will shape the 1980s.**

We are searching—for publication in a major article on "The Young Architects: What They Are Doing, What They Are Thinking, and What They Are Hoping For"—for examples of work by architects or intern architects who are 30 or younger "which expresses your attitudes towards design in the 1980s." The work can be built or in project form; we are in hope of finding a fresh and diverse body of work from young architects which will cause the whole profession to explore its attitudes and thinking. Submissions may be in any medium (though we expect mostly photographs, drawings, sketches)—but must be no larger than 8½ by 11-inch sheets. A brief statement of the problem and program will be needed; and we would welcome a brief statement of your design thinking as reflected in the submission. Please include the name of your school and date of graduation, tell us whether or not you are registered now, and the name and address of your current place of work. The deadline: August 1st, though the earlier the better. Please address your submission to "Young Architects Program."

And a final thought: if you'd care to, we'd welcome your thinking on architecture and the profession in the 1980s. We've been thinking about: What are the most important things that are going on? What will the 1980s be like for architecture and the profession? What should architects be doing differently? What should we be building? What are the threats? What are the great hopes? If you've sat around the office, as we have, talking about these things we'd welcome your thoughts in a letter—whether they reinforce our ideas or get us to re-thinking. Address them to me. —Walter F. Wagner, Jr.

The future  
just  
arrived.







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Autumn Cider (960)

Fog (961)

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## What's Next!

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# **PPG GLASS, ITALIAN GRANITE AND HISTORIC BOSTON. A FITTING COMBINATION THAT SAVES ENERGY.**

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Forbes, Boston. Architects: Skidmore,  
Owings and Merrill, Chicago.



**March contracts for nonresidential building, totaling \$4.2 million, rose 25 per cent above the March 1978 figure,** with gains distributed evenly among commercial and industrial buildings (23 per cent) and institutional and other nonresidential buildings (29 per cent), according to the F. W. Dodge Division of McGraw-Hill Systems Information Company. Commenting on the first quarter's 26 per cent increase in nonresidential and heavy construction, Dodge chief economist George A. Christie observed that they "will be a source of support to the economy over the balance of the year, when some other sectors are expected to weaken." The residential market, gaining 8 per cent on last March, reflected continued strength in multifamily housing and a partial recovery in one-family starts.

**And the report on 1978 housing construction is in: an increase of 6 per cent over 1977,** according to Dodge, which also remarks that this was the fourth consecutive annual advance for housing. Economist Christie attributed the durability of the market to "unprecedented increases in the prime-age home-buying population." Though he expects high interest rates to reduce the volume of homebuilding this year, Mr. Christie foresees "a relatively mild decline of 15 per cent" and "a faster recovery of homebuilding once interest rates begin to recede."

**The 1979 Royal Gold Medal for Architecture has been awarded to the Office of Charles and Ray Eames,** the design firm established in 1941 by the late Charles Eames and his wife Ray. The citation accompanying the medal singles out for particular commendation the Eameses' own house in Santa Monica, California, and their furniture design, and holds that the office's "vocabulary has proved rich enough to enable a new generation of designers to develop in their own right." The Royal Institute of British Architects confers the honor annually.

**The London architectural firm Foster Associates will receive the 1979 R. S. Reynolds Memorial Prize** for Sainsbury Center, a school of fine arts and art gallery at the University of East Anglia in England. Having also received the Reynolds Prize in 1976, Foster's becomes the first firm ever to take the award twice. Details on page 35.

**New Federal policy leans toward increased use of private design firms and other contractors** for goods and services, a change that would reduce reliance on government service departments. Details on page 34.

**The Agency for International Development will finance feasibility studies performed for overseas projects** by American A-E firms to offset government-subsidized advantages enjoyed by foreign firms. Details on page 34.

**The Aga Khan will grant Harvard and MIT \$11.5 million to support teaching and research in Islamic architecture.** The Aga Khan, who is also sponsoring an international competition for architecture and planning in Islamic countries, has expressed distress at the demolition of historic Muslim design and its replacement with often inappropriate Western design. The endowment will finance four professorial positions, create a fellowship for Ph.D. candidates, and enlarge and develop collections at Harvard's Fogg Museum Library and MIT's Rotch Library.

**The Award for Excellence in Architectural Education was presented to G. Holmes Perkins, FAIA,** at the annual meeting of the Association of Collegiate Schools of Architecture in April. Presently Professor of Architecture and Urbanism at the University of Pennsylvania, Mr. Perkins served as dean of the university's Graduate School of Fine Arts from 1951 to 1971, during which time he greatly expanded the architectural curriculum to embrace city planning, urban design and landscape architecture. The award is sponsored by the ACSA and the AIA.

**In celebration of architecture, the AIA planned to assemble its living Gold Medalists at its convention** in Kansas City this month: Philip Johnson, Pietro Belluschi and Wallace Harrison, as well as Mrs. Louis Kahn and Mrs. Richard Neutra—and of course I. M. Pei, this year's Gold Medal winner. At press time, AIA still awaited Kenzo Tange's acceptance, but Buckminster Fuller pleaded a prior engagement, and Marcel Breuer pleaded ill health.

**Four major exhibitions demonstrating Federal contributions to the art of architecture will be shown concurrently** in Washington next spring, and will include original drawings from collections owned by the government. Former GSA Administrator Jay Solomon will head the 16-member organizing committee, and Bates Lowry, former director of the Museum of Modern Art and editor of a history of buildings in Washington, D.C., will direct the showings.

**Peter Blake will head the Department of Architecture and Planning at the Catholic University of America** in Washington, D.C. The former editor-in-chief of *Architectural Forum* and *Architecture Plus*, Mr. Blake is presently chairman of the School of Architecture at the Boston Architectural Center.

**The American Institute of Architects has issued "Energy Planning for Buildings,"** a 156-page publication that outlines energy planning for new and old buildings and describes a manual technique for calculating energy use. The authors are architects Michael Sizemore and Henry O. Clarke and engineer William D. Ostrander. For information: AIA Publications Marketing, 1735 New York Avenue, N.W., Washington, D.C. 20006.

## New Federal policy may promote use of private A-E firms

The tendency of Federal agencies to perform as much design work as possible with their own employees and to contract as little as possible to private firms may be changed.

New rules have been written by the Administration's Office of Federal Procurement Policy telling Federal officials how to decide whether to obtain needed goods and services from private firms and companies or from their own staffs.

The rules cover some \$40 billion in Federal procurement, ranging from typewriters to courthouse designs. Presently about two thirds of this business go to private firms, and Federal workers handle the rest.

No one is sure whether this ratio will be changed, but the rules do establish easy-to-follow guidelines intended to bring consistency to the process so that designers and other business people will have more confidence that they are getting their proper share of the Federal procurement dollar.

The rules say that every agency

must examine each procurement act individually over the next three years and then award private contracts if doing so will result in a saving of 10 per cent or more.

Along with the new rules, the Office of Federal Procurement Policy has issued a handbook intended to help in making the calculations. It points out that a comparison of the contract amount versus the cost of government performance is not alone sufficient to determine which approach is the most economical because such a comparison does not account for the costs of fringe benefits to Federal workers.

The fringe-benefit figure, and specifically the cost of Federal retirement, caused the most trouble for drafters of the policy. Private groups urged a retirement cost figure in the range of 25 per cent of salary, while unions representing Federal employees sought a much lower amount. The rules as written settled on 20.4 per cent. —William Hickman, *World News, Washington*.

## AID will fund feasibility studies for overseas development

An edge enjoyed by architect-engineer teams from other advanced countries—funding by their governments to cover feasibility studies for projects in developing countries—is now available to U.S. design teams and construction firms.

The Agency for International Development is setting up a procedure under which friendly developing countries may request a grant to pay for such studies. This will ease the burden on U.S. design teams, which previously had to absorb such costs themselves or convince host governments to do so.

AID has only \$3 million in this year's budget for such studies. But there is a move afoot to increase the amount greatly.

AID says it has authority for the program in Section 661 of the Foreign Assistance Act, which is intended to promote reimbursable overseas development that results in the purchase of goods or services from private U.S. companies and firms.

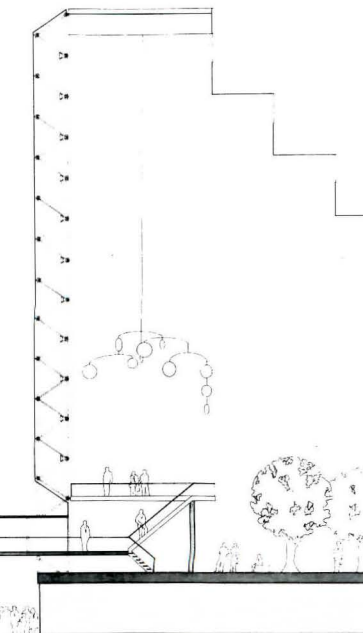
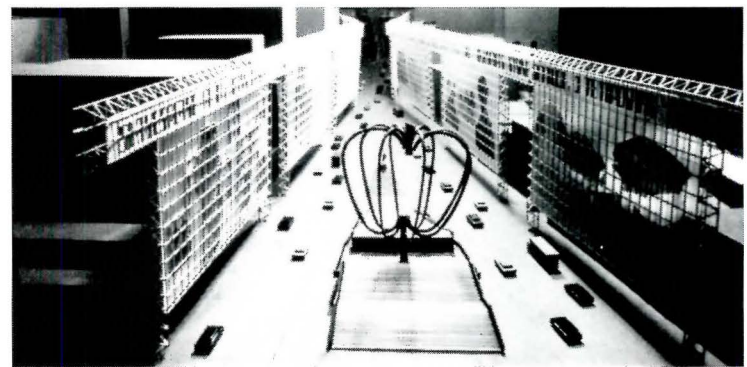
Such funding was previously

available for project preparation studies that were intended to stimulate reimbursable activities when there was some U.S. government involvement. But the new program permits such funding even in the absence of other U.S. participation in the project implementation phase.

Specifically, the grants can be requested for project preparation studies and surveys, including feasibility studies, which could lead to projects that are financed with host-country funds.

One possible problem with the program is that it will be ruled by U.S. government organizational conflict-of-interest guidelines, which place restrictions on a firm that both conducts feasibility studies and later performs actual design work or development. The affected agency can grant waivers to this rule, however, and AID officials have told construction industry interests that it will be relatively generous in doing so. —William Hickman, *World News, Washington*.

## Two architectural approaches to advertising—anti-sign on a Virginia highway, signs as outdoor room on Times Square



Architects, to judge from two recent projects, tend to think ve-e-ry big when they confront the design of display advertising.

The New York City architectural firm SITE, Inc., is widely known for its inventive, to say the least, alloy of sculpture, graphics, building and "the environmental arts," many examples of it executed for the catalog-sales chain Best Products (see RECORD, March 1977, pages 124-127).

For the Best showroom on U.S. 1 near Richmond, Virginia, SITE has designed a titanic logotype that the firm calls an anti-sign, since for much of its length it will be illegible. The 36-ft-high "transparent" letters B, E, S and T, baked in gray on white porcelain enamel, overlap and "metamorphosize" with increasing rapidity to the eyes of passing motorists until, above the main entrance, they coalesce as a black, gray and white

abstraction. As the word turns the corner of the building, legibility returns.

For Manhattan, New York City architect Jack L. Gordon, AIA, has an even more Brobdingnagian vision: a lighted kinetic billboard 120-ft high enveloping Times Square from the south side of 42nd Street to the north side of 48th Street and bordering the outsides of Broadway and Seventh Avenue.

The billboard, a light-weight self-supporting space frame, could shield a system of walkways and second-floor entrances, accessible by escalators and staircases, as well as electronic equipment to operate lasers, rear-screen projectors and computerized signs. The comparatively puny news banner that now circles the old Times Tower would be replaced by a 14-block-long headline streaming around the entire square.

Mr. Gordon had no client for the design—he and other firm members work on the large model as time and funds allow—and planners, entrepreneurs and critics who have seen the design view it, the architect admits, with a mixture of admiration and skepticism.

Nonetheless, he feels, the concept is commercially and esthetically practical. At an estimated initial cost of \$6 million, with revenue coming in from advertisers, the project would be a quick and relatively inexpensive way to clean up Times Square. The screen-billboard, Mr. Gordon thinks, would unify the collection of disparate buildings around the square and transform the space into a vast outdoor room. At the same time, the variety of signs would forestall visual homogenization. And flamboyance has always been, after all, the very stuff of Times Square.

## DOE rule allows architects to perform energy audits

Although the Energy Department really prefers that architect-engineer firms conduct energy audits under its energy-conservation grants program, it will permit states to employ firms comprising architects alone.

The rules covering energy auditors are included in regulations published by the Department to implement a 1976 Federal law. The outcome of the audits affect some \$900 million in retrofit grants for schools, hospitals, local-government and public-care facilities.

In an early draft of the regulations, DOE specified that the audits be performed by analysts who have energy conservation experience and are registered as professional engineers or A-E teams. Architects protested, and the regulations writers backed down part-way.

The final regulations say that the technical analyst "should be a registered professional engineer or, ideally, an architect and engineer working as a team." But the states, at their option, may establish an alternative standard requiring that the analyst have "sufficient experience and training to perform all the minimum requirements of a technical assistance program."

The American Institute of Architects is still unhappy. It believes the regulations should specify that the auditors be registered as either architects or engineers. —William Hickman, *World News, Washington*.

## Pulitzer-winner Paul Gapp discusses critical values

When Paul J. Gapp, the Chicago architectural critic who earlier this year won the Pulitzer Prize for criticism, talks about his values in architecture, his speech abounds with phrases like "how a building fits into the city fabric," "human scale," and "social significance."

That is because, in his seven years of writing architectural criticism for *The Chicago Tribune*, Mr. Gapp says, he has tried to do two things: relate the architect's problems and solutions to the public, and criticize architecture in a context larger than just a building's exterior appearance.

"I spend a lot of time finding out what the architect's problems were, and gaining understanding of his siting, cost, technical and client problems, if any," he says. "For example, when Montgomery Ward decided to stick with its old location in Chicago, near low-rent housing, I wasn't too fond of Yamasaki's building, but there was a lot of social significance in the company's staying, not running away from the blacks."

A former executive director of the Chicago chapter of the American Institute of Architects, Mr. Gapp has no formal training in architecture. He says he's taught himself, by reading

and by listening to architects.

Mr. Gapp says he most likes Art-Deco buildings of the '20s and '30s, with New York City's Chrysler Building at the head of the list. He dislikes "slavishly Miesian, cookie-cutter boxes that look as if they were extruded out of a machine."

Indeed, biting critical columns were among those submitted by the *Tribune* to the Pulitzer jury. One called Chicago's new Marriott Hotel "a failure of depressing magnitude." Mr. Gapp wrote that, in the Marriott, architect Harry Weese gave North Michigan Avenue "two hulking concrete boxes totally bereft of character." It should be noted that Mr. Weese himself is not fond of the building, and says Marriott restricted him in its design.

Mr. Gapp hopes that his success as an architectural critic for a daily newspaper—a rather rare occupation—will induce more newspapers to start architectural criticism columns. "I've tried to bring architectural criticism out of the ivory tower and down to the level of public comprehension, to answer the questions Joe Average wants answered." —Dan Brown, *World News, Chicago*.

## Guidelines cover energy use in all government buildings

Federal officials are beginning to implement a plan aimed at saving 20 per cent of the energy used in all existing government buildings and to cut consumption by 45 per cent in new government buildings.

The first step is the development of proposed guidelines for conducting preliminary energy audits of existing government buildings to examine their energy consumption characteristics. These will provide the basis for retrofitting audited buildings with more efficient energy systems.

Also included in the preliminary phase are guidelines for Federal agencies to follow as they draw up 10-year plans for reducing consumption of energy from nonrenewable sources such as oil, gas and coal for space heating and cooling, ventilation, hot water and lighting.

Designers of all new buildings will have to consider alternative energy-saving measures and the use of renewable energy sources such as sun, wind, geothermal heat, biomass or solid waste.

The new evaluation procedures are an outgrowth of two Federal laws and a Presidential Executive Order. At the center of the evolving regulations is a requirement that DOE-established life-cycle costing methods be used to determine that all new Federal buildings are cost-effective. This requires agencies to use life-cycle cost rather than initial cost in evaluating new building designs.

Hearings on the proposal were held in three cities in May. —Herbert Cheshire, *World News, Washington*.



Ken Kirkwood photos

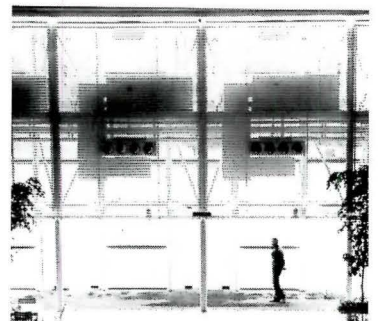
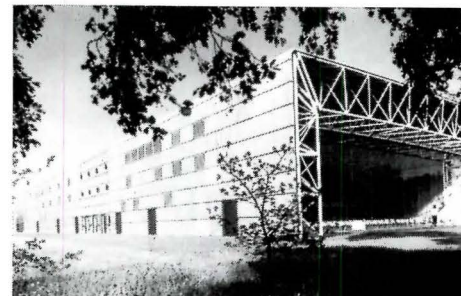
## High-tech English art gallery takes the Reynolds award

Foster Associates of London will receive this year's R. S. Reynolds Memorial Award for the Sainsbury Center for the Visual Arts at the University of East Anglia, Norwich, England.

This is the first occasion in its 23-year history that the prize has had a repeat winner: Foster took the Reynolds award in 1976 for the Willis Faber & Dumas office building in Ipswich, Suffolk.

Sainsbury Center, donated to the university by Sir Robert and Lady Sainsbury to receive an art collection that they have also given to the university, houses a school of fine arts and a 300-seat public restaurant as well as extensive gallery space.

An apotheosis of high-tech design, the center was virtually factory-built, field work involving only the assembly of parts. For the enclosure—walls and roof—Foster designed a system of 4- by 6-ft interchangeable aluminum panels, solid, glazed or gridded. The inner wall and ceiling lining are a "tunable" system of perforated aluminum louvers allowing adjustment of natural light.



Members of the jury were chairman Elmer Botsai, FAIA, immediate past president of the AIA; Philip Johnson, FAIA, winner of the 1978 award; and Willi Walter, winner of the 1972 award.

Foster Associates will receive a \$25,000 honorarium and a sculpture commissioned from Herbert Ferber.

## IIA plans awards for housing in developing nations

The recently established International Institute for Architecture plans an "Honor Awards Program for Housing and Community Development Projects: Demonstrating Successful Approaches to Improving Living Conditions for the Poor in Developing Countries."

The awards program aims "to identify, analyze and report on the finest recent achievements in the field of housing and community development for the poor—and to recognize and reward those responsible." To

select the best recent projects, IIA will appoint an international advisory committee, which will follow criteria established by professional advisors Gutheim/Seelig/Erickson.

In addition to medals, award winners will receive cash prizes to be presented to the communities involved for health and educational purposes. Blake Hughes, president of IIA, says that the Institute is presently engaged in soliciting grants to raise \$175,000 for the establishment of the Honor Awards Program.

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**New U.S. stamp issue commemorates architecture**

The U.S. Postal Service will initiate a series of stamps commemorating American architecture with an issue of four new stamps this month.

The block will carry engravings of four Classical Revival buildings constructed during the first 50 years of the republic, all of them architecturally influential, all still standing—Thomas Jefferson's Rotunda at the University of Virginia, Benjamin Latrobe's Roman Catholic Cathedral of Baltimore, William Strickland's Merchants Exchange in Philadelphia, and Charles Bulfinch's Massachusetts State House in Boston.

The stamps, designed by painter and printmaker Walter D. Richards, will be printed in black and brick red, and will carry the architects' names and the buildings' identifications.

"The choice of these four historic buildings for the commemorative stamps is most appropriate for our Celebration of Architecture," observed Ehrman B. Mitchell, Jr., president of the American Institute of Architects. "They represent monumental works of architecture important to the history of a young country as symbols of future greatness. Their human scale and efficiency have allowed them to remain in productive use since the time they were constructed."

Other stamps in the American Architecture Series, which will trace the development of building design in the country during the past two centuries, will be issued over the next four years.

For this group, the first day of issue was scheduled to coincide with the opening of the AIA's national convention in Kansas City on June 4, and first-day covers will be cancelled at the convention's temporary post office. The stamps go on general sale June 5.

Philatelists may order first-day covers through June 19, whether they affix the stamps to their own envelopes or ask the Postal Service to affix them. Orders should be sent to First Day Cancellation, Postmaster, Kansas City, Missouri 64108, or, if the Postal Service is to affix stamps, to American Architecture Stamps at the same address. (First-time or special-occasion collectors should consult their local postmasters for proper procedures.)

**Nigeria builds Abuja in the shadow of Aso Hill**

Abuja, the new federal capital of Nigeria, will occupy a crescent on the Gwagwa Plains in the country's Federal Capital Territory (see RECORD, May 1979, page 37). Its form taken from an encircling ring of low mountains, the city will develop along the crescent's cusps from a central core that roughly bisects it. (The government has reserved the land bounded by the cusps as parkland to deter in-fill along the route to the airport.)

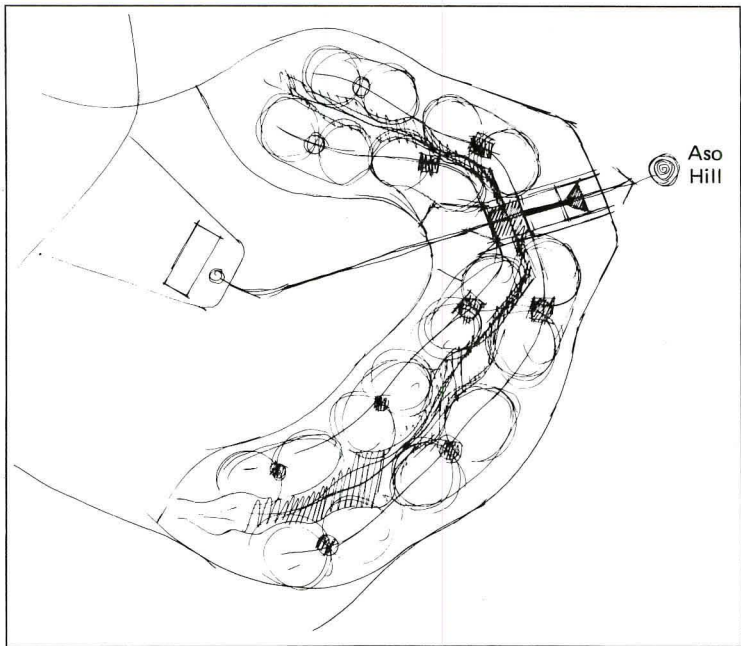
The planners regard transportation as the service that will guide and control the direction of development. Vehicular expressways define the outside edges of the crescent; inside and parallel with the outer roads, a pair of public transit spines are projected. The planners recommend that these be closed to all vehicles except buses in order to avoid discouraging riders with slow stop-and-start mixed traffic.

The transit corridors will straddle a long, green spine that will run the length of the city and that will preserve a stream valley both for esthetic reasons and for drainage.

At right angles to these spines, transverse roads will allow lateral movement and will also divide the city into development sectors. Each of these "growth modules" is expected to become a mini-city with a population of 100,000 to 250,000.

Transportation nodes, strung along the transit spine, will divide each sector into four major areas for residences and local commerce. The planners expect density in the development sectors to be greatest, not surprisingly, around the transit nodes. Each of the sectors will also contain a varying number of subcores to accommodate "modern" employment and traditional marketplaces with the informal activities that tend to cluster around them.

Permanent residential sectors will be developed early in the course of construction: the government plans no "temporary" workers' camps.



The location and planning of Abuja's central area, which will house both government and business, took special study to define symbolic and functional requirements.

One of the planners' primary considerations was the government's desire that Aso Hill, the commanding granite inselberg that overlooks the Gwagwa Plains, dominate the city visually and symbolically. The axis of the central area (below), focused directly on Aso Hill, determined the location of all other sectors.

The positioning of major symbolic buildings housing the "Seat of Government," moreover, had both to reinforce the political hopes expressed in the new constitution and to reflect the traditional political values of the Nigerian city-states. In many old Nigerian capitals, the seat of government is placed at the edge of the city center. None of the major buildings at Abuja, therefore, will occupy the center of the city at the junction of the longitudinal green spine and the Aso Hill axis.

In addition, the separation of legislative and executive functions is less absolute than Americans are

accustomed to. The National Assembly building, however, will take pride of place near the top of a hill looking across the triangular National Arboretum toward Aso Hill. Both executive and legislative offices will surround the assembly building.

The Presidential Palace, in its own large park farther down the axial mall, will face the Supreme Court across National Square.

Assorted administrative offices will line the mall, and the central business district will lie farther still toward the end of the central area, which will be anchored at its south-western end by the large National Sports Center. (Nigerians are passionate soccer fans.)

Planning consultant to the Federal Capital Development Authority is the joint-venture firm International Planning Associates, comprising Archisystems International of Van Nuys, California, Planning Research Corporation of McLean, Virginia, and Wallace, McHarg, Robert and Todd of Philadelphia. The FCDA is led by Commissioner/Chairman Mobolaji Ajose-Adeogun and Executive Secretary Abubakar Koko.





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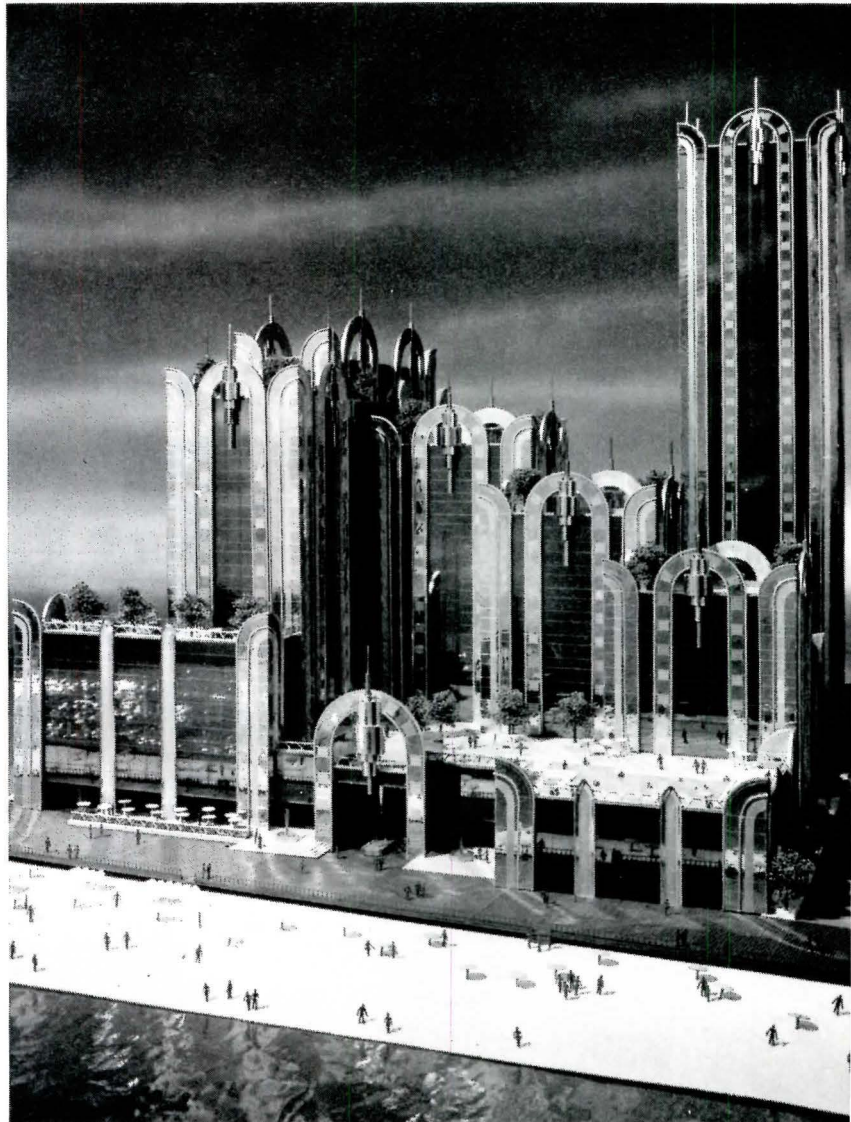


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**Cincinnati builds a complex in Fountain Square**

At the south end of Fountain Square, the large open plaza at the center of Cincinnati's downtown, the Cincinnati Redevelopment Corporation presently has under construction a multi-use complex comprising a 28-story office building, a 17-story hotel, a three-story retail atrium and two levels of underground parking. Designed by Abramovitz-Harris-Kingsland, Fountain Square South will form a wall at one

end of the plaza. The architects massed the towers at the back of the complex, framing the atrium, so as not to impede the entrance of sunlight into the square and to give the light low-rise atrium chief visual importance for the square's numerous pedestrians. The buildings, faced with pinkish-gray granite, will tie into other downtown buildings by an existing system of second-floor walkways.



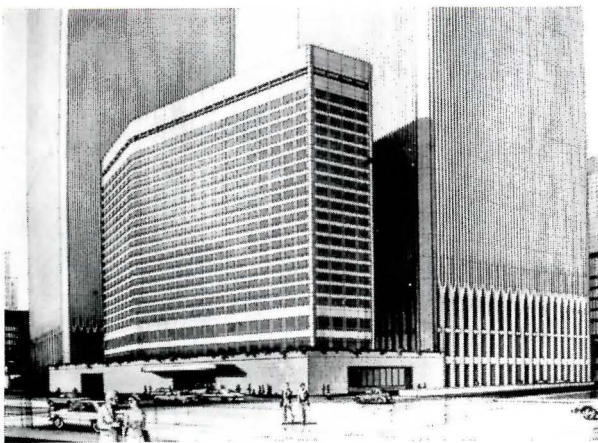
**A shimmering Ritz hotel rises in Atlantic City**

The new Ritz hotel and casino, scheduled to open around the end of next year, promises a shimmering mass of towers and arches for the Boardwalk in Atlantic City. Built on the site of the former Ritz-Carlton and using much of the old building, the new Ritz will be built in two phases. The first calls for wrapping the existing hotel in reflective glass—silver arches, gold lights and spandrels, with pink and blue accents—and for the addition of three towers of diminishing heights, a monumental entrance on the Boardwalk, and a large multi-colored outdoor chandelier at the "keystone" of each arch. Phase two, which the devel-

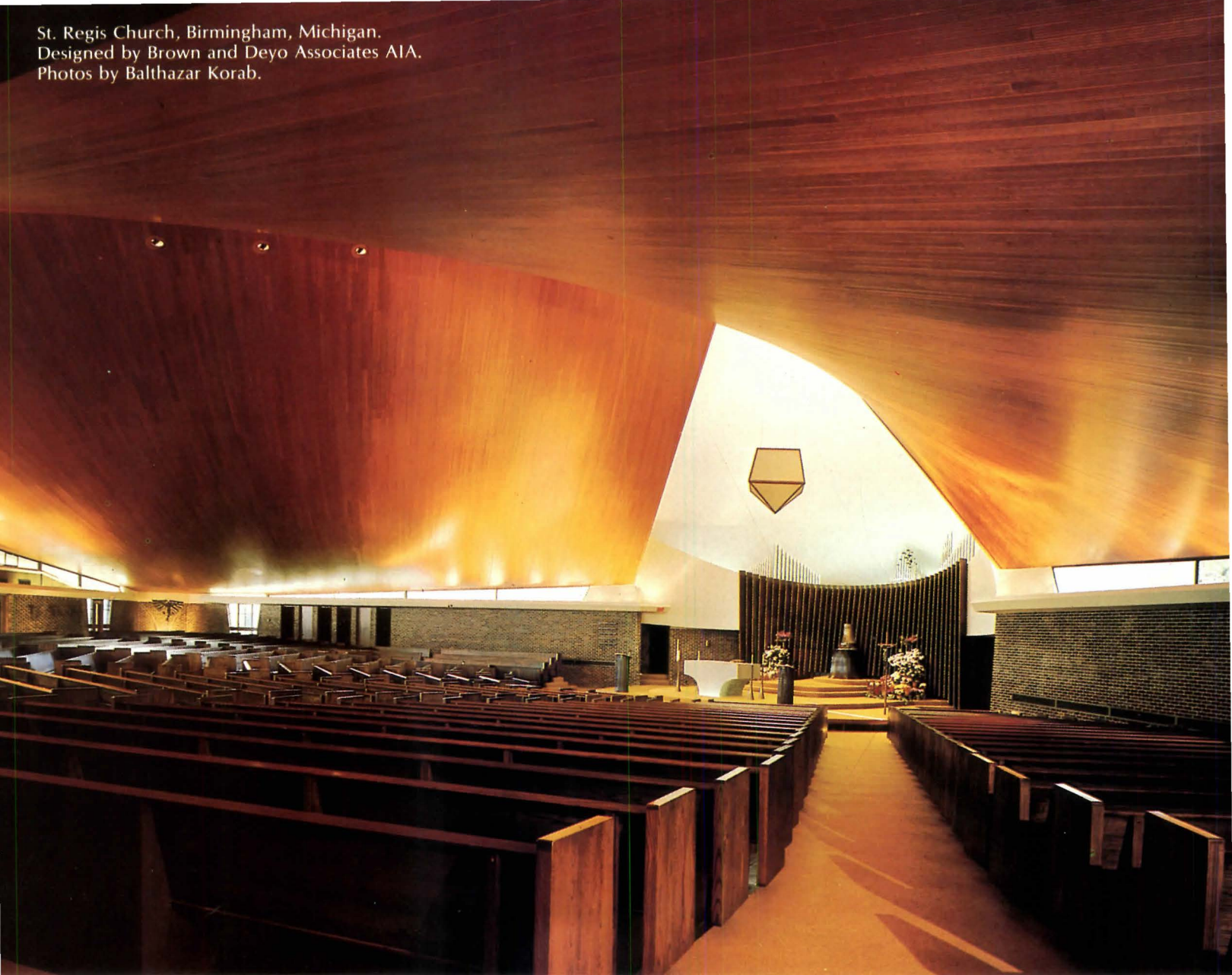
opers hope to start in 1981, calls for a 30-story tower. Since casino gambling was legalized in Atlantic City, the state of New Jersey has placed controls on development along the Boardwalk. All casinos must be located in legitimate hotels. Moreover, the hotels must be new buildings because the state feared that tacky renovations might emphasize the saltwater-taffy aspects of the seaside resort. The Ritz was designed, in what all members of the team describe as exceptionally close collaboration, by the New York office of Welton Becket Associates and designer/restaurateur Warner LeRoy.

**OM designs first hotel for lower Manhattan in 150 years**

For an important site in downtown Manhattan—an in-fill site linking the World Trade Center's two off-set towers—Skidmore, Owings & Merrill have designed a 22-story hotel for Hilton International. When it opens about a year from now, Vista International will be the first new hotel in lower Manhattan in nearly 150 years. The aluminum- and glass-clad deluxe hotel, which will serve business travelers, will have floor-to-ceiling windows commanding views of the Hudson River and the harbor.



St. Regis Church, Birmingham, Michigan.  
Designed by Brown and Deyo Associates AIA.  
Photos by Balthazar Korab.



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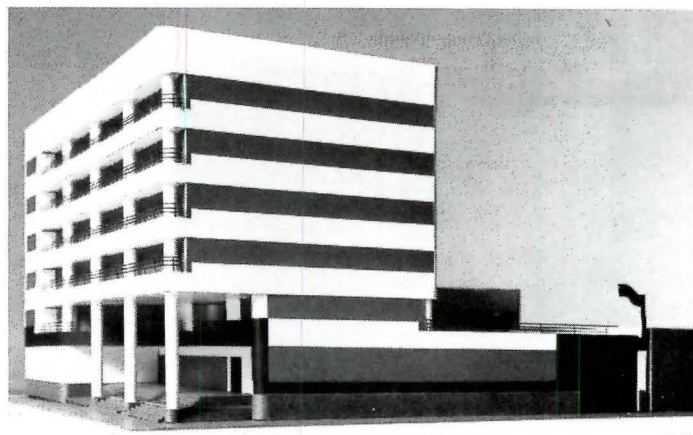
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**Five buildings receive SARA's Gold Ribbon for design excellence**

In its annual National Design Competition, the Society of American Registered Architects this year gave 17 awards, including five Gold Ribbon Awards of Excellence. "The competition was divided into construction cost categories," said John Pankovich, National Design Awards Chairman. "This allows small structures and firms to compete on an equal footing with large ones." Among the five categories were one for projects costing more than \$5 million, another for those costing between \$1 million and \$5 million, and another for those costing less than \$1 million. There were in addition a category for interiors costing less than \$1 million and another for designs not yet constructed. Benham-Blair Affiliates of Oklahoma City took first honors in two categories—once for a teaching hospital costing \$21.6 million, again for a small institutional building costing scarcely a hundredth the amount (\$235,000). The firm of E. Jerome Tamen & Associates also took two Gold Ribbons, one for interiors—for the design of their own offices in Los Angeles (1), designed by Stephen W. McCarthy under the design direction of Mark Bielski—and the other for the design of an office condominium in Santa Monica, California (2), designed by Hatty Hatch. The Presbyterian Medical Center in Oklahoma City (3), designed by Benham-Blair, took the Gold Ribbon for buildings costing more than \$5 million. The Gold Ribbon for buildings costing \$1-5 million went to the Shadow Bend Town Houses in Wheeling, Illinois (4), designed by the Balsamo/Olson Group, Inc., of Oak Brook, Illinois, and the Gold Ribbon for buildings costing less than \$1 million was awarded to the National Art Educational Association Headquarters at Reston, Virginia (5), designed by Benham-Blair. Blue Ribbons, in the same sequence of categories, went to Eugene J. Sawka, Philadelphia; William Dorsky Associates, Beachwood, Ohio; again to Dorsky Associates; Ebbe Videriksen, AIA, Architects & Associates, Sherman Oaks, California; and Meyer, Kasindorf & Mancino, Great Neck, New York.





# White collar employment: impetus behind the office building boom

Few construction markets have changed so dramatically in the past several years as office building. Since its abysmal slump in 1975-76, new construction has almost doubled, surpassing even the boom years of the late 1960s and early 1970s. Last year marked the largest single yearly gain in office building construction on record, as square footage soared from 137 million in 1977 to nearly 207 million in 1978 and contract value advanced from just over \$5 billion in 1977 to a phenomenal \$9 billion last year. The resurgence in office building construction can be attributed to a blend of cyclical and structural economic forces affecting employment and demographics.

While growth in total employment has been dramatic, it has been exceeded by growth among white collar employees, the principal occupants of office buildings. Reflecting the combination of increased participation among women in the labor force and the structural transformation of the economy from predominantly manufacturing to service and information industries, white collar employment has grown as a percentage of total employment from 17.5 per cent in 1900 to more than 50 per cent in 1978 (chart 1).

The combination of vibrant economic growth in the past two years and the enormous number of newly employable persons coming of age has set the stage for the turnaround in office building. With unemployment hovering at just below 6 per cent, the economy has absorbed huge numbers of new workers—with more than half of them in occupations classified as "white collar." From an average annual increase of 700,000 new white collar workers per year between 1950 and 1965, and nearly 1.3 million per year during the second half of the 1960s, white collar employment in 1976 and 1977 rose by 1.5 million per year and last year soared to over 2 million per year.

The relationship between white collar employment and the demand for office building is direct, but not static. By testing various equations to determine this relationship, a formula based on a ratio of 142 gross square feet per new white collar employee was found to best explain the movement between forces of supply and demand in office building (see chart 2). The Dodge Indicator of Office Building Demand is derived from the application of this ratio to yearly increases in white collar employment. Because shortages and surpluses of office space often persist for several years, however, it is necessary to analyze differences in supply and demand over time. By subtracting demand from supply on an annual basis and carrying forward the cumulative total (positive or negative), the capacity of the market

to absorb new construction at a given time can be determined.

Significantly, average annual office building occupancy rates, lagged about six months, mirror the movement in cumulative supply minus demand (see chart 3). This relationship implies an equilibrium occupancy rate of about 91 per cent, and illustrates the ability of the cumulative measure of surplus/deficit to anticipate conditions of excess supply or demand in advance of weakening occupancy rates and rentals. This indicator accurately foretold the buildup of excess demand in the late 1960s, flagged the REIT-inspired oversupply in the mid-1970s, and, as early as 1976, pointed to the current resurgence in office building construction.

### Continued strength. . . but only in the short run

Despite the exceptional year in office building in 1978, new construction failed to keep pace with demand (see chart 2). As a result, occupancy rates should approach 96 per cent this year, the highest level ever. As this excess demand is worked off, the potential for new construction over the next few years is exceptional—in the range of 200 to 250 million square feet per year.

The only note of caution in the short-term outlook is the much-discussed economic slowdown, variously scheduled for 1979 or early 1980. As the years 1971 and 1975 attest (see chart 2), anything that much exceeds the Administration's goal of a "soft-landing" could send employment plummeting.

With little vulnerability in the immediate future, the longer run outlook is less sanguine. The same demographics that propelled growth in white collar employment to its record high of two-plus million in 1978 portend a rate of growth only half as large by the mid-1980s. This implies a market capable of sustaining only about 150 million square feet of new construction per year.

*Thomas E. Kavet, economist  
 McGraw-Hill Information Systems Company*

Chart 1

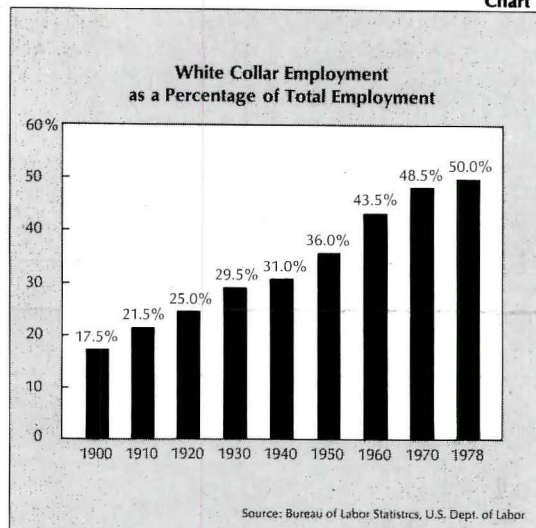


Chart 2

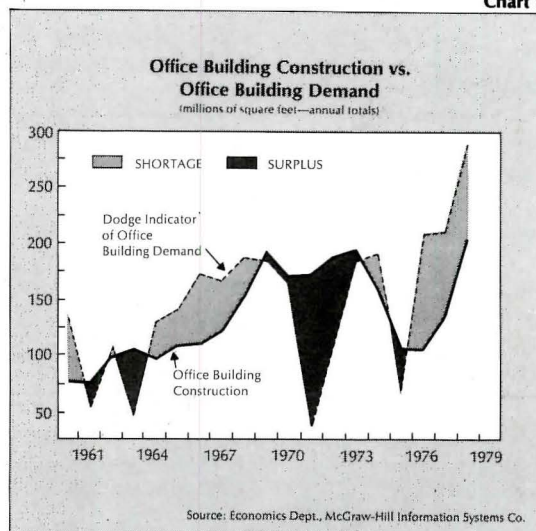
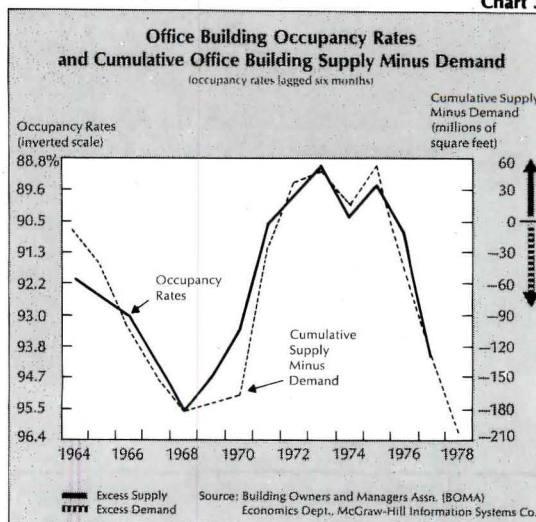


Chart 3



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## Architectural licensing laws can impact design/build projects

An extensive array of legal concerns can influence how architects and non-architects engage in design/build projects. Among these are the licensing laws enacted by each state to regulate the practice of architecture. When the method of project delivery varies from the traditional approach to architecture upon which many licensing laws were based, the participants in the project must try to determine in advance how a state's licensing law may affect their contract and its legality. The law is unclear from state to state whether anyone but a licensed architect can enter into a contract for architectural services. If a contract both to design and to build a project is entered into by a person or entity not licensed to practice architecture, a court may declare the contract illegal and deny recovery of fees. Some recent cases clearly illustrate the consequences of non-architects contracting with clients for professional services.

by Arthur T. Kornblut, Esq.

From a purely legal standpoint, only persons or entities licensed as architects in accordance with state statutes are considered eligible to perform architectural services as defined in the law, or to use the appellation "architect." Mere involvement by a licensed architect in a project often is insufficient to satisfy the requirement that a licensed professional be legally responsible for the services called for in the contract. The courts, however, have been far from unanimous in determining the legality and enforceability of contracts for architectural services when the contracting party has not been a licensed architect. In some states carefully prepared contract provisions have avoided otherwise technical violations of the law. In others, the courts have looked to the strict letter of the law and the status of the contracting parties to vitiate such contracts.

There are relatively few cases analyzing the enforceability of architectural contracts by persons who are not licensed in a given jurisdiction. With widespread practice in the corporate form being a modern development, and with emerging forms of practice such as design/build, only a handful of cases have dealt with the issue of whether corporations, whether organized to practice architecture or otherwise, can legally contract for architectural services.

### A Texas court upheld a design/build contract for "furnishing" design . . .

In a very recent Texas case (*Seaview Hospital, Inc. v. Medicenters of America, Inc.*) the validity of a design/build contract was evaluated

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

"Legal Perspectives" is published with the understanding that the publisher is not rendering legal service. If legal advice is required, the services of a competent professional should be sought.

in light of the Texas architectural licensing law. A licensed general contractor had entered into a contract with a hospital to design and build a hospital project. The contractor specialized in hospital projects, but it did not perform architectural or engineering services itself. Instead, the contractor subcontracted with licensed professionals for these services and included their fees as part of the "turnkey" price to design and construct the project.

In this case, the contract between the contractor and the hospital called for the performance of services in three phases involving the preparation of a feasibility study, preliminary design documents and final construction documents. The total amount for the architectural and engineering services in the three phases was stated in the contract to be \$80,268. The parties did not enter into an actual construction contract, but they agreed to proceed with the professional services.

The hospital paid for the services contemplated by Phases 1 and 2, but it refused to pay for the Phase 3 services. The hospital then directed the contractor not to perform any further design or construction activities. With the project appearing to have been abandoned, the contractor sued the hospital to recover the amount still owed for the professional services. In its defense, the hospital alleged that the contract was illegal because the contractor was not licensed to practice architecture or engineering in Texas, and it filed a cross action to recover the \$58,000 already paid for Phases 1 and 2.

An appellate court in Texas, affirming a trial court judgment in favor of the contractor, analyzed both the Texas licensing statute and the contract between the parties. The licensing statute clearly regulated the practice of architecture in Texas and prohibited practice by any person not duly licensed. The

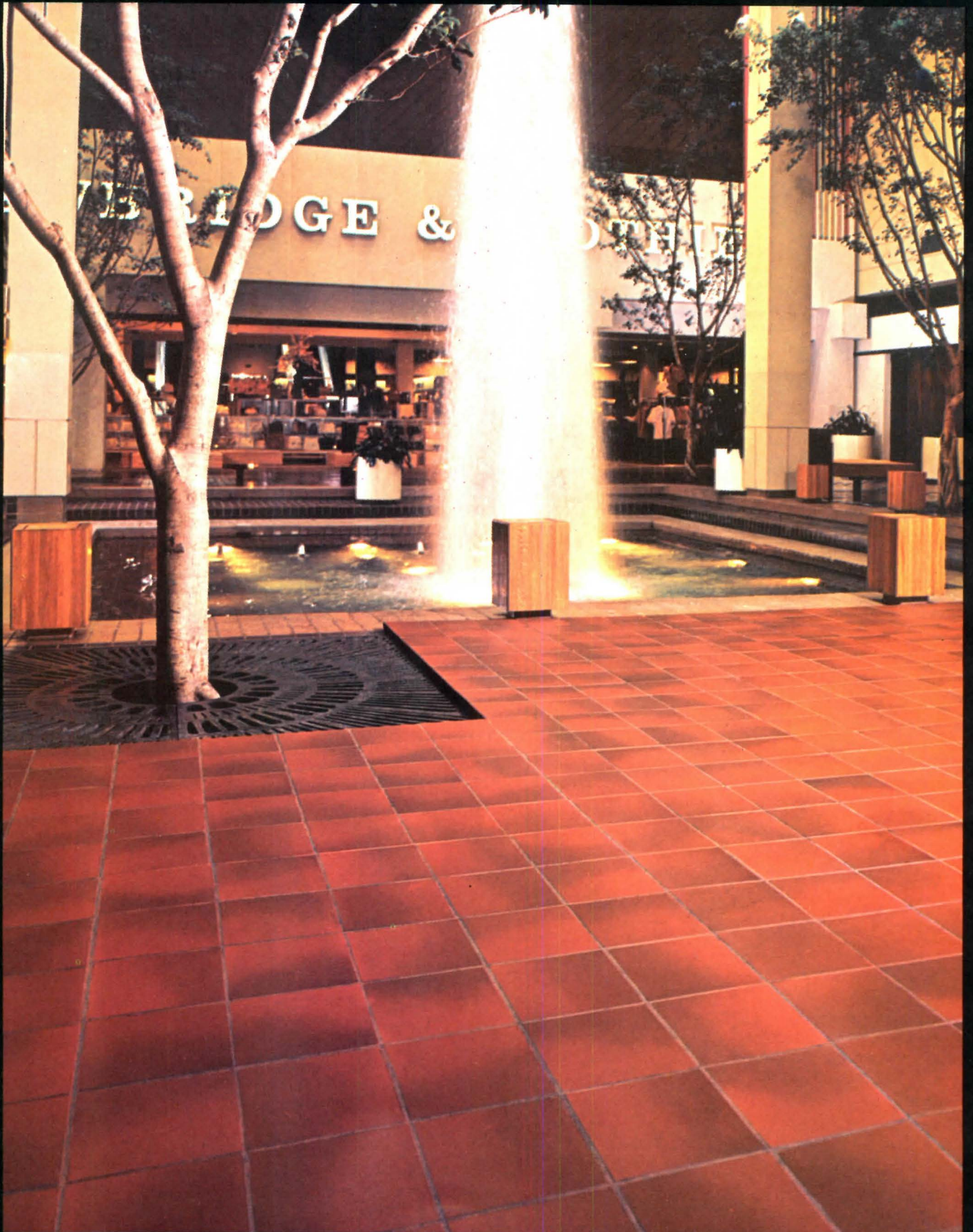
court, however, was persuaded by the contractor's argument that its contract did not require it to practice architecture or engineering but rather to arrange for the performance of those services by persons who were properly licensed. Because the services, in fact, were performed under a subcontract with the contractor by professionals licensed in Texas, the controlling question thus became whether the contractor was obligated to *perform* architectural and engineering services or whether the contractor was to *furnish* those services.

In permitting the contractor to collect his fees, the court noted that there is "a vast difference between a contract to 'furnish' services and a contract to 'perform' the same services" and the contractor's obligation to furnish the services by hiring duly licensed architects and engineers fulfilled the objectives of the licensing statutes.

### . . . but a similar contract for "performing" design was voided in Louisiana.

Contrary to the result reached in Texas, the Louisiana Supreme Court recently ruled that a contract between a school board and a corporation for architectural services on a new high school project was void because the corporation was not licensed to practice architecture in Louisiana (*West Baton Rouge Parish School Board v. T. R. Ray, Inc.*). The contract required the corporation "to perform 'professional services' as an architect including the preparation of drawings and specifications . . ." and it intended to rely on an employee licensed as an architect in Louisiana to be in charge of the project. The employee resigned before the project was finished, at which point the school board decided to terminate the contract. Ignoring the participation by the employed architect, the court, as did the court in the Texas case, focused on the contract language related to the professional services. The contract was illegal, declared the court, because the corporation was not, and could not be, licensed as an architect to perform the services.

Although these cases relate to problems stemming from non-compliance with architectural licensing laws, architects considering embarking on design/build projects as principals may be affected by similar laws licensing or regulating general contracting services. The basic nature of the services and specific contract language must be weighed against statutory requirements.



*Ember Flash—Plate No. 689*

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## A partial guide to painless CM projects: Part II

Concluding their two-part article, which began last month (page 65), San Francisco architects Herbert McLaughlin and Cynthia Ripley take up the architect-CM working relationship. Definition of roles, fees, contractual responsibilities, contingencies, liability issues, and value engineering are several key areas that must be considered prior to entering into a working relationship of this type.

by Herbert McLaughlin and Cynthia Ripley

This article tends to concentrate on potential pitfalls so that all can avoid them. This can seem to cast a negative tone; however, we are enthusiastic about the CM process—properly and carefully used.

It should be made very clear that this article is written with the complex, technical building such as a hospital or laboratory, in the forefront of our consciousness. We believe that our comments apply to simpler projects such as office buildings or apartment houses, but clearly problems of cost estimating, control and construction, and therefore architect/owner/CM relationships, are much simpler in repetitive buildings without complex mechanical systems.

Further, last month we stated that we felt that the fast-tracking of complex buildings was inappropriate. This statement was made with reference to the ability of fast-track to save money in a period of normal cost escalation (7 to 10 per cent per year). We do feel that in a complex building, problems of functional compromise, coordination of systems, added fees and change orders usually exceed savings. However, in periods of unusual price escalation (10 to 18 per cent per year), fast-tracking may save marginal amounts. More to the point, we believe, is the faster delivery that fast-track can provide.

Conflicts arising in the working relationship often fall into the following areas:

- Operational problems and techniques.
- Extent of liability for decisions.
- Fees to cover the working process.
- Misunderstandings about roles.

Of these, the most critical usually are operational problems, particularly regarding estimating and value engineering.

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Ms. Ripley is a project architect in the firm, and is a lecturer at the University of California, Berkeley.

### The CM contract should require the CM to provide frequent cost estimates

During the pre-design, design and design-development phases of a project, the CM provides initial cost information which shapes the project in explicit ways. It often determines the scope, the building configuration, and the materials used. Cost information is provided in two formats: a formal cost estimate at selected intervals, and value engineering proposals to bring the project into line with the owner's budget if estimates indicate that costs exceed it.

Too often the estimate is not thorough enough to really fine-tune the building to the level of detail the architect needs. For example, the CM will advise building a stucco rather than steel panel exterior wall but will be unwilling to advise on the relative economy of alternative stucco wall sections. The architect may need more frequent cost evaluations as the design develops than at the formal completion of phases. The CM contract must spell out the frequency and level of completeness with which estimates are to be made. In a CM project of any complexity, it is advisable, for the architect's protection, to have budget estimates and approvals at 50 per cent of schematics and 50 per cent of design development as well as at the end of the phases. This forces the CM to keep his cost estimates current, and to effect changes in a prompt manner. It is also a substantial protection in terms of revisions to drawings for value engineering alternatives or changes.

The accuracy of estimates depends on the CM's familiarity with work in progress in the architect's office. Both architects and CMs need to devote more attention to improving their communication tools. Careful and time-consuming discussions need to occur with enough frequency that both groups are familiar with one another's work and ideas about the project. The CM's common excuse for a bad estimate is that the

architect did not inform him of a system—or that changes were made without the CM's knowledge. It is the CM's job to be fully informed about all development in the architect's office. If he has to place a man in the office—so be it. The excuse that "It wasn't on the drawings" is invalid. If a system or part of a system is missing, the CM should know enough about the building type to know it.

A frequent source of conflict between CM and architect is the CM's charge that the architect has "changed" drawings. Therefore, the CM states that he was unaware that some building system was modified or included at all. The architect may very well have done this—except that he refers to it as "developing." It is useful for architects and CMs to meet weekly to review drawings and to issue a joint memo that itemizes changes or developments and their impact on budgets or delivery times.

A significant problem, particularly in a fast-track situation, is that of lagging cost estimates. The CM has been hired to expedite the work in most instances, so the architect will be expected to compress his schedule to the absolute minimum. However, the CM will normally require three to four weeks to the end of each formal architectural submission to refine this cost estimate. Ideally the project would stop during these estimating periods to incorporate cost information into the design. Since it usually is not practical, it is imperative that the architect be compensated for redrawing that inevitably results as estimates are refined and value engineering suggestions approved.

Since the CM estimates so explicitly affect the architectural product, it is in the owner's and architect's interest to retain an independent estimator for a "second opinion." It is useful to verify that the CM is neither overestimating or underestimating the work involved. The method of estimating, the format of estimates and the timing of estimates should be carefully spelled out in the owner/CM contract. This is particularly important if the owner is to retain an independent cost estimator to verify the CM prices. The cost estimate should then be in a format that is acceptable to the cost estimator and which parallels standard architectural specifications and practices. It is also important that the CM make available to the owner, at the time of cost estimates, detailed

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work sheets indicating quantities and unit prices that have been utilized to establish the cost estimate. This will enable the architect, the owner and any cost consultants to review these estimates in detail.

### **Value engineering is best accomplished with additive and deductive alternates**

It is imperative that value engineering be introduced at the beginning of a project for the CM/architect relationship to be a smooth one. Value engineering proposals are the tools that the CM has for controlling and reducing costs on a project. If the proposals come too late in the process, they represent a change in program, a redrawing problem for the architect and an extra fee, and schedule delay problems for the owner. One man's value engineering can frequently be the architect's "changes to approved drawings." Architectural contracts need to explicitly refer to redrawing required by late value engineering proposals.

The least painful method of value engineering is to establish a set of additive and deductive alternates to the project in the initial phases. A skilled construction manager can provide alternative concepts and associated prices for every system in the building from total wall sections to height variations of the tile wainscoting in bathrooms at the time of schematics. At the earliest possible date, ideally during programming, an outline specification should be prepared by the CM and architect together to document the budgetary ground rules for the project. This includes reports on cost and operating cost aspects of various structural, mechanical and finish systems. To deal with the problem of "what does it look like?", the architect should establish files in which drawings and photographs of buildings are correlated with costs so that owners can get an impression of the type of building finishes and appearances their budgets will buy.

Often owners have unreal expectations concerning the accuracy of estimates and the ability of the CM and architect to anticipate construction costs during design. The accuracy of an estimate is related to the completeness of the documents. The tool for anticipating estimating inaccuracies is an adequate contingency budget.

We recommend that contingencies be broken down into categories so that they can be most clearly understood and adjusted as the project moves forward.

1) A design contingency to allow the development of changes in systems; to accommodate unforeseen complexities in

systems; to allow for changes in scope and area. We, for instance, find that the area of a project sometimes grows as drawings progress from schematics to design development. Expansion joints, added mechanical rooms, duct requirements, all increase square footage. This growth is unfortunate but better at least in our view, than the phenomenon of oversizing all spaces during schematics to accommodate growth in a few spaces.

This contingency usually reduces from 15 per cent to 2 per cent in a complex project as we go from 50 per cent schematics to working drawings and achieve better definitions.

2) An escalation contingency. Since inflation is changing rates so rapidly, it is best to identify this as an entirely separate item.

3) A construction contingency to cover changes during construction due to errors or omissions in the plans or changes or added features on the part of the owner—normally 1.5 per cent, or 3 to 5 per cent in a fast-track job.

4) Post-occupancy contingency. Whether or not a CM is utilized, it is advantageous for the client to have budgeted some money for changes to the project immediately after it is occupied. It is inevitable in a modern building, which may have taken five years to plan and build, that there will be systems or aspects of systems in the occupied building that do not meet the needs of the users.

### **Liability for shared decisions requires considerable contractual refinement**

Architectural contracts nearly always include a redraw clause as a device for keeping the building design within the owners budget. The CM is normally responsible for cost estimating and control. Clearly, he should therefore be made responsible for paying the architect for redrawing if the bids come in high or for belated value engineering. He should also share liability for the performance of systems he recommends. The extent of liability for shared decisions is an area that requires considerable contractual refinement if the present trend of CM participation continues.

If the CM proposes or approves a system or a set of details that later prove faulty, he should share in the liability for repair. It is, we believe, unrealistic at this point in the evolution of the CM's role to make him share responsibility for errors and omissions in the details and coordination of the architect's plans, except in design/build, although we believe that a strong case can be made for this.

What about sharing cost savings? This is seldom done and when done, usually after bidding. Almost all CMs argue, and it makes sense, that it is one of their primary jobs to control costs during design and to promote highly competitive bidding. Thus their fee should be adequate compensation.

This is most certainly true. However, it is often useful to provide a powerful incentive for savings after bidding. Such savings often occur in any event through change orders suggested by subs (who certainly retain at least 20 per cent of the savings in this instance). If after bids within the budget have been received, the CM (and why not the architect) can initiate a change in materials or can successfully negotiate a sub-bidder down due to a material price change or a simplification of procedures, why not provide a reward for this work? Strictly speaking, it is not above and beyond the scope of services of the normal contract, but it *is* more work.

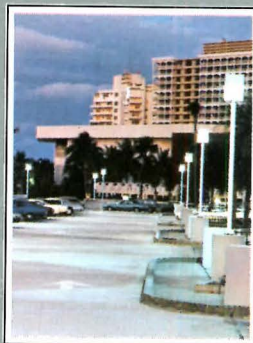
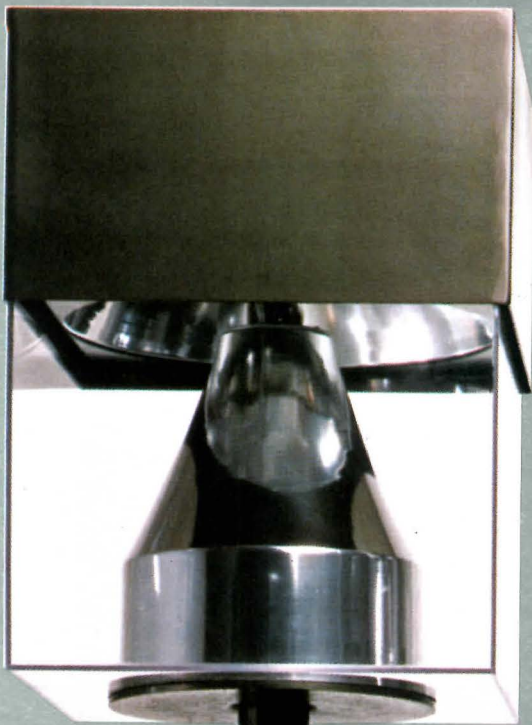
In the CM structure, the architect must share basic decisions about the functionality and appearance of the building with the CM. The CM may reveal carefully guarded estimating secrets that are often the substance of his firms' expertise. The CM, the architect and the owner have to learn to participate in an ongoing process that is sometimes laden with anxiety and even controversy.

Our experience has been that both architect and CM try to serve the client's best interest, however their emphasis often differs. The architect is directed to push for the highest quality building product consistently trying to nudge his design to the limits of the budget; the CM's charge is to control and even to reduce costs. This tension between cooperative and experienced participants can be very fruitful.

Some owners, however, will want to emphasize an adversary relationship believing that this approach allows all options to surface effectively. This seldom works well for anyone, particularly if there is a lack of clarity about cost estimating/redraw responsibility. Then both architect and CM will be endeavoring to protect their interests.

Surmounting the controversy to deliver a good project requires a strong commitment to the CM process. This kind of commitment is possible if the project in question is an appropriate one for CM participation, if the CM qualifications have been reviewed, and if the working relationship between CM, architect and owner has been spelled out in enough detail so that their roles are clear and project fees cover the amount of work required.

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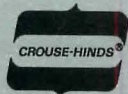
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## Establishing an expatriate policy for overseas employees

During the last five years, the shift of worldwide economic forces has resulted in the emergence of overseas work, particularly in the Middle East, as a most viable market for professional services. With the increasing emphasis on international operations, more architects and engineers are assuming another title—expatriate. And, as the number of expatriates grows, so grows the need for expatriate policies. Firms without such policies are experiencing the problems and costs resulting from this lack. Like the need for developing personnel policies, the fundamental reasons for formulating an expatriate policy are to save time, save money and maintain employee motivation.

by Scott W. Braley

By stating an expatriate policy, a firm makes decisions regarding overseas employee transfers only once rather than "reinventing the wheel" each time a new assignment is considered. By clearly describing the terms of an expatriate transfer, the costs associated with an overseas assignment can be quantitatively analyzed. Furthermore, when they are identified in advance of contract negotiations, many, if not all of the increased personnel expense costs can be reimbursed by, or passed on to, the client. Finally, by developing an equitable expatriate policy and administering it uniformly, all employees know they are getting a fair shake when asked to accept an overseas transfer.

Regardless of the size or type of firm, the nature of the proposed assignment, or the duration of the overseas transfer, various circumstances of the expatriate experience are common and must be considered as the basis for developing an expatriate policy. Expatriate transfers in professional service firms are generally sporadic and temporary rather than permanent assignments, and usually only one or a limited number of employees is involved. Moreover, because only a significantly important client or large project can merit the commitment of an expatriate assignment, employees selected for transfer are usually middle- to senior-level professional staff. Another common factor is that professional service firms are characteristically regional in their operations. That is, employees are not asked to make numerous intercity transfers. Consequently, considering an expatriate assignment is indeed new and uncharted ground for most employees.

In addition to these common characteristics, expatriates evidence generally common attitudes and experiences. For some, an expatriate assignment is seen as an exciting chal-

lenge and opportunity to test both personal and professional capabilities in a foreign environment. In this regard, the overseas transfer is approached as a learning and growing experience.

While the glamour and charm of international travel and foreign living are attractive inducements, they alone will not satisfy the employee's professional or personal needs. In addition, the company considers an individual for international assignments not on the basis of his desire to travel; rather, consideration is based on the need for an individual to perform a specific function and/or the potential for the company to successfully operate in a foreign country. In this regard, consideration must be given to the effect of overseas assignment on not only the individual and his (or her) dependents, but also on the company. Inevitably, the "ambience" of the foreign country wears off after the first few months of residence. It is at this point that the individual and the family become increasingly more aware of standard of living, ability to travel, job satisfaction and personal adjustment with foreign nationals. The terms of the expatriation employment agreement must assure the individual that the company is genuinely concerned with his professional and personal situation. The expatriate must feel that he can trust the company.

### **Expatriate policies fundamentally address financial implications of the move**

Professional service firms can learn timely and very beneficial lessons regarding the expatriate and expatriate policies from product-oriented, multi-national companies doing business overseas. An expatriate policy should be comprehensive in scope, addressing all topics associated with expatriate transfers. Fundamentally, the company's philosophy should be that "an employee worth sending abroad is an employee worth taking care of." Similarly, the expatriate must be equally willing to evidence his confidence in,

and loyalty to, the company. Fundamentally, it is important that the company policy address and control the implications, principally financial, of assigning employees to foreign countries. In this regard, the company's "ability to pay" must, and will eventually, be the principal determinant of an expatriate policy. Equality and unanimity are considerations which may create the most significant problems. Attempting to establish an expatriate policy which considers all overseas transfers in a uniformly equitable manner is a most challenging and complicated task.

### **Salary adjustment, housing, transportation and taxes are part of any policy**

A professional service firm's expatriate policy must be individually tailored to meet its unique needs and situations. Nonetheless, any expatriate policy will address certain basic considerations. These are:

**Salary adjustments:** Virtually all companies, clients and employees agree that there should be additional compensation for overseas duty. One method of approaching the salary question is to establish a base salary and make subsequent adjustments for foreign assignment. This technique has proven to be easily understood by employees, quantitative, and therefore manageable by the company. In particular, a base salary is established for the position to be filled and equated to a U.S. salary. That base salary may then be adjusted for cost of living, differential overseas incentive/premium and domicile hardship. For example, a project architect relocating to Saudi Arabia may receive a base salary of \$25,000 per annum adjusted upward by 25 per cent cost of living, 15 per cent overseas incentive and 30 per cent domicile hardship factor. Thus, the total salary would be \$42,500 per annum. By establishing a base salary equivalent to U.S. pay status, both the company and the expatriate clearly understand that the adjustments are made for overseas living. Upon return to the U.S. the adjustments may be discontinued without the inevitable feelings of disappointment when lump sum salaries are lowered. One aspect which cannot be overlooked is that adjustments for "overseas incentive" and "domicile hardship" are subjective and are therefore one of the first targets of critics. Finally, and perhaps most importantly, the policy should state the interval, place and currency in which salary will be paid.

*continued on page 74*

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**Housing:** In some cases, the company may provide a house or apartment for the expatriate. Similarly, the company may reimburse an expatriate in full or in part for rent/mortgage payments in the foreign country. Regardless of the method chosen, the expatriate policy must address related considerations. Is all, or part, of the housing allowance to be considered taxable income? Who is responsible for the disposition of the expatriate's U.S. residence? Does the overseas housing allowance include utilities and/or domestic staff? How often and on what basis is the housing allowance paid? To what extent are temporary living "per diem" expenses covered before permanent housing is arranged? Companies should keep in mind that because the assignment is usually temporary and because the employee has limited knowledge of the local economic situations, the expatriate may be generally reluctant to invest in foreign real estate.

**Transportation:** Not unlike "housing," a means of transportation for the expatriate is an important consideration. Is an automobile provided or must the expatriate seek his own form of transportation? Again, the policy must consider what is to be included in an allowance, tax implications and disposition of the expatriate's personal property.

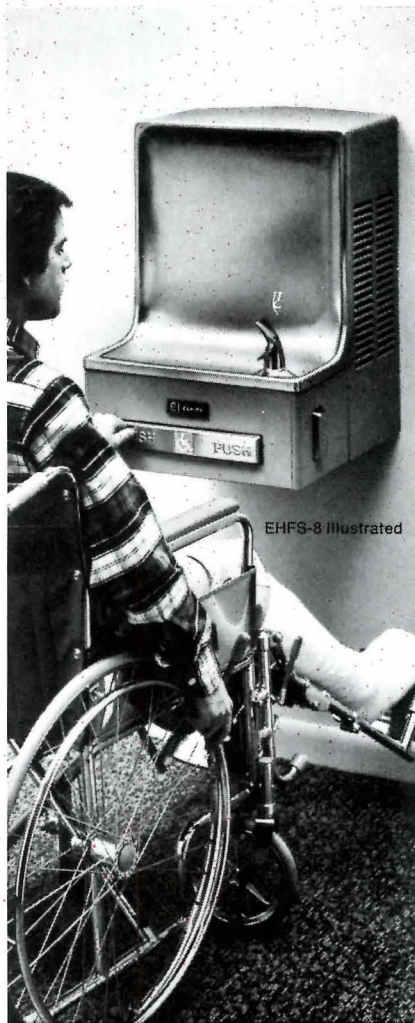
**Shipment/storage of personal belongings:** Most companies reimburse the expatriate for the cost of shipping required household goods, furnishings, and personal effects to the foreign country. Similarly, storage of goods left in the U.S. is generally provided. It is important that the expatriate policy consider: limits for shipment and storage; costs included or excluded from reimbursement (e.g., packing, insurance, customs duties, etc.); and excess baggage allowances.

**Travel expenses:** The expatriate policy should stipulate acceptable modes of transportation (e.g., first class vs. tourist air fare). It should also describe the limits established for both the dollar amount and length of time during which out-of-pocket travel expenses will be reimbursed.

**Family status:** The expatriate's family status is a most important consideration. If married, may the expatriate's immediate family transfer to the foreign country? On the other hand, if the expatriate is not married, must accommodations be shared?

**Fringe benefits:** When transferred overseas, one of the expatriate's principal concerns is whether or not domestic fringe benefits will be continued. Specifically, the company must verify and state in its expatriate policy if, and to what extent, life and health insurance will be provided during the overseas assignment. Similarly, will additional vacation and sick leave benefits be granted? Will private "American" school tuition expenses be reimbursed for dependents' education? Will the expatriate and family be granted paid "home leave" for an annual return to the U.S., beyond vacation.

**Tax equalization:** Perhaps one of the most complicated expatriate policy considerations is that of income taxation. Primarily,



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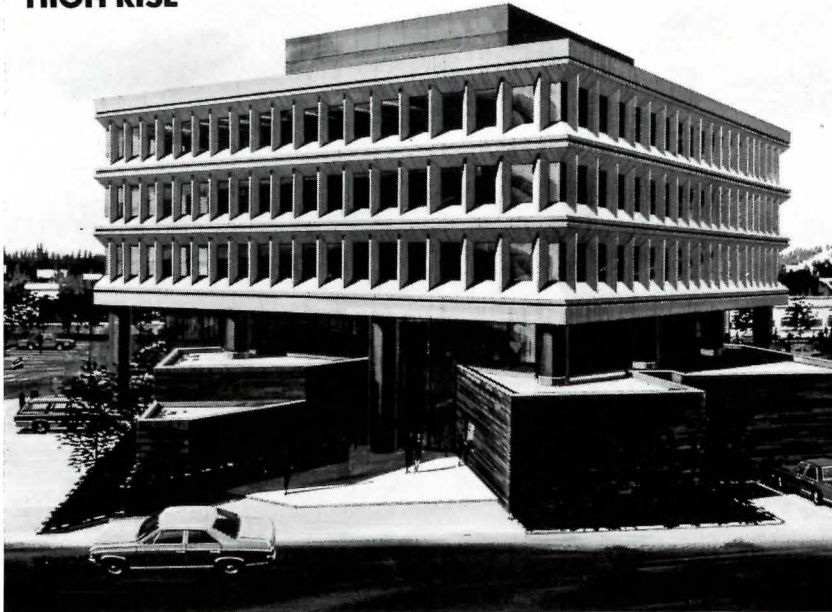
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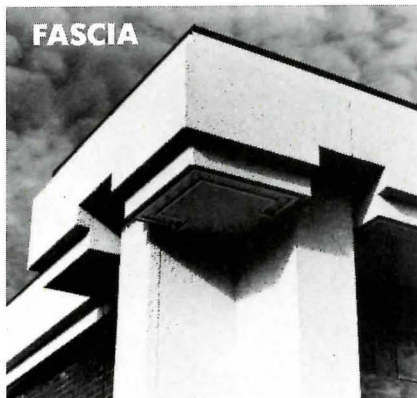
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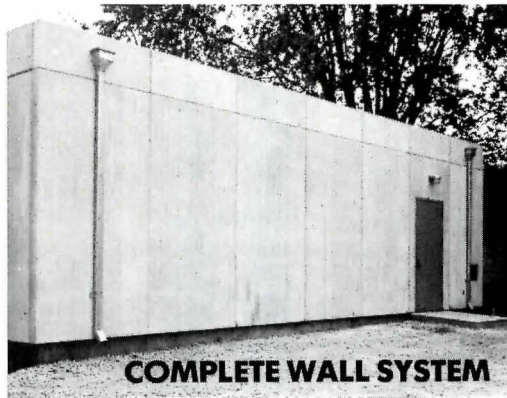
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because of recent and pending changes in IRS regulations, it is most difficult to determine which benefits will be classified as "taxable income" by the U.S. government. Moreover, foreign governments may also impose income tax on the expatriate. Fundamentally, the company must decide whether the expatriate or the company will assume the responsibility for increased taxation which may result for the overseas transfer.

Many companies subscribe to a "balance sheet" approach with regard to expatriate compensation: that is, an expatriate's total income tax liability—Federal and state—which would have been incurred had the expatriate remained in the U.S. Furthermore, because an expatriate will, in most cases, be liable for a foreign-country income tax, the company will reimburse the expatriate for all required foreign tax payments. To ensure that the expatriate's total tax liability is neither greater than nor less than that incurred had he/she not transferred overseas, a part of the tax procedure for expatriates is to prepare a hypothetical tax return. The return is prepared using the U.S. base salary. Given the computed tax burden, the expatriate is responsible for the hypothetical tax burden and the company pays, or reimburses, the difference. While the logic may be straightforward, the mechanics and legal implications of tax equalization may be devastating. Therefore, it is absolutely imperative that a company considering this technique seek the input of both legal counsel and accounting/financial advisors.

### Consultants are available to help establish expatriate policies

Given these background considerations and general policy topics, what is the first step for a professional services firm that is considering the development of an expatriate policy? First, the management of the company must affirm its commitment to and belief in the value of a stated expatriate policy. Second, the firm must candidly and honestly assess the cost/benefit of its overseas ventures. Third, an individual who has had expatriate experience, or at least someone who has "transferred" for the firm, should be designated to assist in establishing the policies. Finally, to the benefit of all practitioners, several international relocation consultants specialize in assisting firms in developing and implementing expatriate policies. In this regard, guides have been developed to assist the preparation of expatriate policies. One of these such guides has been prepared by International Compensation, Inc., in Boston. It offers both background theory and practical application data. Also, the U.S. Foreign Service, and the U.S. Chamber of Commerce can furnish overseas cost of living indices.

In summary, the implications of an overseas assignment are of significant concern to not only the employee but also the company. Similarly, the *circumstances* of establishing an expatriate policy and subsequently reaching employment agreements that are equitable and acceptable to both the employee and the company merit considerable attention.



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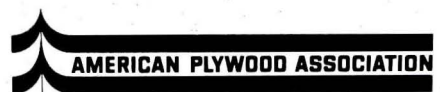
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## A guide to investment tax credit and component depreciation

Expertise in tax law, Internal Revenue Service regulations, and tax court rulings are as important as skill in construction and knowledge of construction costs. McGraw-Hill's Cost Information Systems Division now provides to client corporations and their architects Investment Tax Credit and Component Depreciation Analyses. The programs, initially developed by Wood & Tower, a construction cost management firm recently acquired by McGraw-Hill, can help architects and engineers to design for—and clients obtain—full benefits from the Federal capital development tax credit.

McGraw-Hill Investment Tax Credit specialists constantly study and review all tax legislation that affects construction, in order to advise architects and owners on how recent legislation will affect their building projects. Utilizing a comprehensive data base that incorporates the actual construction figures and quarterly updates of material and labor costs for 485 cities throughout the United States, McGraw-Hill's Cost Information Systems can provide a computer costs analysis during any phase of a construction project, from conceptual budget projections to an itemized analysis of depreciation components. Presently, two widely used applications for this computer analysis are the Investment Tax Credit and Component Depreciation Analyses.

With the McGraw-Hill Investment Tax Credit Service, a detailed review is made of a proposed building's drawings, specifications, and construction documents, and a general meeting is set up to discuss the client's tax considerations. A McGraw-Hill construction cost analyst visits the building or building site to inspect and review the facilities. All construction components are identified, segregated and given a cost valuation. McGraw-Hill then compiles an extensively documented report, giving special tax schedules for claiming estimated tax credits and depreciation.

### How the architect labels plans can affect investment tax credit

Current Federal tax law provides that investment in productive capacity rates a credit equal to 10 per cent of the investment. Generally, this credit is available for production machinery and other equipment and not for the building itself. However, those parts of the building that are in direct support of the equipment are eligible on the same basis as the equipment. Often, the problem is picking out eligible tax deduction items from a long, confusing list of labor and material investments.

In many cases the problem lies in the language. A particular item's Investment Tax Credit eligibility may hinge on how the item is

labeled on drawings. For example, an attached platform which supports equipment will not be eligible for an Investment Tax Credit if the architect labels it a "mezzanine." On the other hand, if the architect calls it an "equipment platform," it may very well be eligible for an Investment Tax Credit. Part of the McGraw-Hill service includes working with an architect to make sure that nomenclature used on the plans is in keeping with the Internal Revenue Service. Basing its analysis on specifications submitted by the client, McGraw-Hill identifies and provides nomenclature for cost items eligible for the Investment Tax Credit. An immediate result of this analysis is a complete list of legal deductions supportable at an IRS audit. In the end, the tangible result can be a sizeable tax savings.

### The Energy Act of 1978 provides tax credit for building energy systems

The recently enacted Energy Act of 1978 offers tax savings of 10 per cent when specific building components are utilized. In drafting plans, an architect could consider alternate energy systems including boilers other than oil or natural gas-fired; equipment that uses coal, geothermal equipment and equipment for producing synthetic liquid, gaseous or solid fuel. In addition, specifically defined energy systems that are specially designed to reduce the amount of energy consumed in any process used at any existing industrial, agricultural or commercial facility are eligible for tax credit savings. Although "passive solar equipment" is ineligible, solar or wind energy equipment which generates electricity both to heat and cool is considered a tax credit saving. Recycling and shale oil equipment also fall into the deductible category. Temperature and humidity control systems which pertain to a specific process are also eligible.

Typically, each Investment Tax Credit determination is accompanied by a Component Depreciation Analysis, although the latter is often performed by itself when an existing, older building has been purchased. The IRS has set guideline life spans for buildings based on their function. While a certain

structure may enjoy an assigned "life" of 40 years, its purchase price may be recovered through depreciation during that time.

With proper documentation, the building can also be depreciated on a component-by-component basis. In determining the useful life expectancy for each functional component of property, consideration is given to such things as the history of lives of similar components; the type, character and reasonable life expectancy under projected operating conditions relative to the designed use; the economic obsolescence resulting from changing economic conditions in relation to the use of facilities; and factors specific to the suitability of the structure—use, location, architectural quality, etc.

Using the computer and a detailed inspection report, the McGraw-Hill service segregates construction costs by component, and assigns each component a useful life. A building that has a projected 40-year lifetime may actually expect only 33 years of service based on the weighted life of the components. While this approach does not increase total depreciation, it speeds it up by allowing more rapid recovery of the investment and re-investment of monies generated.

Many companies lack the expertise to determine accurately the depreciation of individual components of a building. This system brings actual construction experience to bear in determining the average useful lives of different building components. Currently, owners and corporations are taking a harder look at the drawbacks of the do-it-yourself approach. With a computerized Investment Tax Credit system, a tax manager can avoid spending many valuable days researching the tax eligibility of specific construction cost items. Through the combined efforts of McGraw-Hill's Cost Information Systems Division's construction estimating staff, cost accountants, national data base of construction cost items and construction tax consultants, these asset management services can be provided at a reasonable cost within a relatively short period of time. Naturally, complete confidentiality is assured.

Additional details on this tax saving system may be obtained by contacting: Mr. Frank Benz, McGraw-Hill Cost Information Systems, P.O. Box 28, Princeton, New Jersey 08540. (609) 921-6500.

Elizabeth Brager  
McGraw-Hill  
Cost Information Systems Division



# FOUR HEALTHCARE FACILITIES THAT PLANNED FOR FUTURE CHANGE... WITH INTERSTITIAL SPACE DESIGN.

Anyone concerned with the planning and building of healthcare facilities knows that these structures are destined for many changes after completion.

An effective and economical answer to this problem: Interstitial Space Design—a system which incorporates intermediate spaces between working floors.

In these spaces, electrical, mechanical and special service equipment, communications lines and piping and ducts are housed and serviced...allowing the working floors to undergo major changes without interrupting vital services. And maintenance of services need never disrupt normal operation of working floors—a key factor to a hospital which must function around the clock.

## **Steel for Flexibility and Economy.**

Structural steel plays an important part in the concept. Large, column-free, open floor spaces and the long spans necessary to allow major functional changes



Academic Facility for  
Rush University at Rush-  
Presbyterian-St. Luke's  
Medical Center, Chicago, Ill.

**Boyne School of Dental Science,  
Creighton University, Omaha, Nebraska.**



are only possible with steel. An important cost consideration: many of the steel trusses used for interstitial structures are shop-assembled, which can lower construction costs and reduce erection time. The deep trusses in the interstitial spaces provide a strong yet light frame from roof to foundation—which also results in economies.

The new, well-planned healthcare facilities pictured here all used the Interstitial Space Design System. To find out more about them, or for more information regarding the many applications for structural steel, contact a USS Construction Services Representative through your nearest U.S. Steel Sales Office. Or write for the Technical Reports to P.O. Box 86 (C1168), Pittsburgh, Pa. 15230.

**United States Steel**



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TRADEMARK

Hennepin County Medical Center, Minneapolis, Minnesota.  
**ARCHITECT:** Medical Facilities Associates General, Minneapolis, Minnesota. A Joint Venture of Smiley-Glotter Associates and Thorsen & Thorshov Associates.  
**HOSPITAL CONSULTANT:** Booz, Allen, Hamilton, New York, New York.  
**STRUCTURAL ENGINEER:** Bakke Kopp Ballou McFarlin, Minneapolis, Minnesota.  
**STRUCTURAL CONSULTANT:** Le Messurier Associates/SCI, Cambridge, Massachusetts.  
**GENERAL CONTRACTOR:** M. A. Mortenson Company, Minneapolis, Minnesota.  
**STEEL ERECTOR:** N.H. Sandberg Erection Company, St. Paul, Minnesota.

Boyne School of Dental Science, Creighton University, Omaha, Nebraska.  
**ARCHITECT/ENGINEER:** Leo A. Daly, Omaha, Nebraska.  
**GENERAL CONTRACTOR/ERECTOR:** Peter Kiewit Sons' Co., Omaha, Nebraska.  
**STRUCTURAL STEEL FABRICATOR:** Drake-Williams Steel Inc., Omaha, Nebraska.

Academic Facility for Rush University at Rush-Presbyterian-St. Luke's Medical Center, Chicago, Ill.  
**ARCHITECT:** Metz Train Olson & Youngren, Inc., Chicago, Illinois.  
**STRUCTURAL ENGINEER:** C. A. Metz Engineers, Chicago, Illinois.  
**STRUCTURAL CONSULTANT:** LeMessurier Associates/SCI, Cambridge, Massachusetts.  
**GENERAL CONTRACTOR/CONSTRUCTION MANAGER:** Morse/Diesel, Inc. Chicago, Illinois.  
**STRUCTURAL STEEL FABRICATOR/STEEL ERECTORS:** American Bridge Division of U.S. Steel.

Good Samaritan Hospital, Dayton, Ohio.  
**ARCHITECT:** Levin Porter Smith, Inc., Dayton, Ohio.  
**HOSPITAL & HEALTH SERVICES CONSULTANT:** E. D. Rosenfeld Associates, Inc., White Plains, N.Y.  
**STRUCTURAL ENGINEER:** R. S. Fling & Partners, Columbus, Ohio.  
**GENERAL CONTRACTOR:** B. G. Danis Co., Dayton, Ohio.  
**STRUCTURAL FABRICATOR:** (Now known as Berkley Steel Division, Inc.) Camden Steel Corp., Camden, Ohio.  
**STRUCTURAL ERECTOR:** J. O. Berkley Co., Inc. Gettysburg, Ohio.

**Good Samaritan Hospital,  
Dayton, Ohio.**





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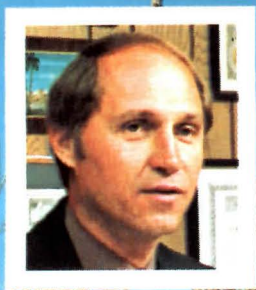
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Brand Urethane Backing



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## **TERNE, FRANÇOIS MANSARD AND THE CONTEMPORARY IDIOM**

Few architectural elements are more traditional than the classic mansard roof. Its current adaptation to highly contemporary design thus provides a dramatic example of "the very old becoming the very new," a phrase which Frank Lloyd Wright once applied to Terne metal itself. And wherever such fascia elements are used, the outstanding functional characteristics of Terne, along with its inherent affinity for both form and color, are available at relatively moderate cost.

### **FOLLANSBEE**

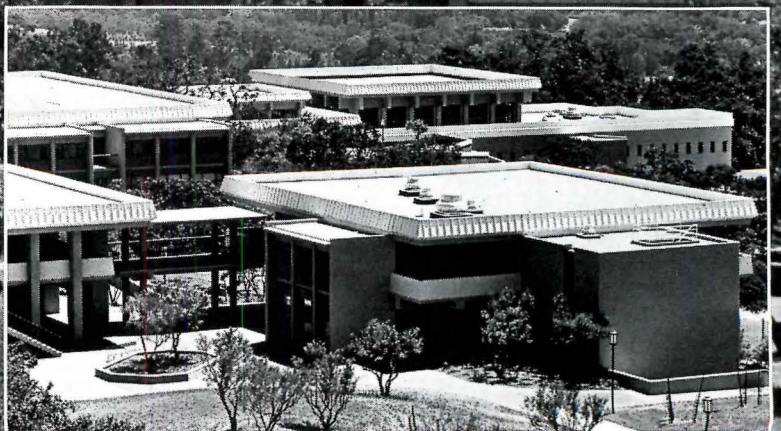
FOLLANSBEE STEEL CORPORATION  
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SAN MATEO COMMUNITY COLLEGE DISTRICT,  
SAN MATEO, CALIFORNIA

ARCHITECTS: CHAN-RADAR & ASSOCIATES, AND  
WELTON BECKET AND ASSOCIATES  
SAN FRANCISCO, CALIFORNIA

ROOFER: MARELICH MANUFACTURING COMPANY  
SAN BRUNO, CALIFORNIA

**Circle 53 on inquiry card**

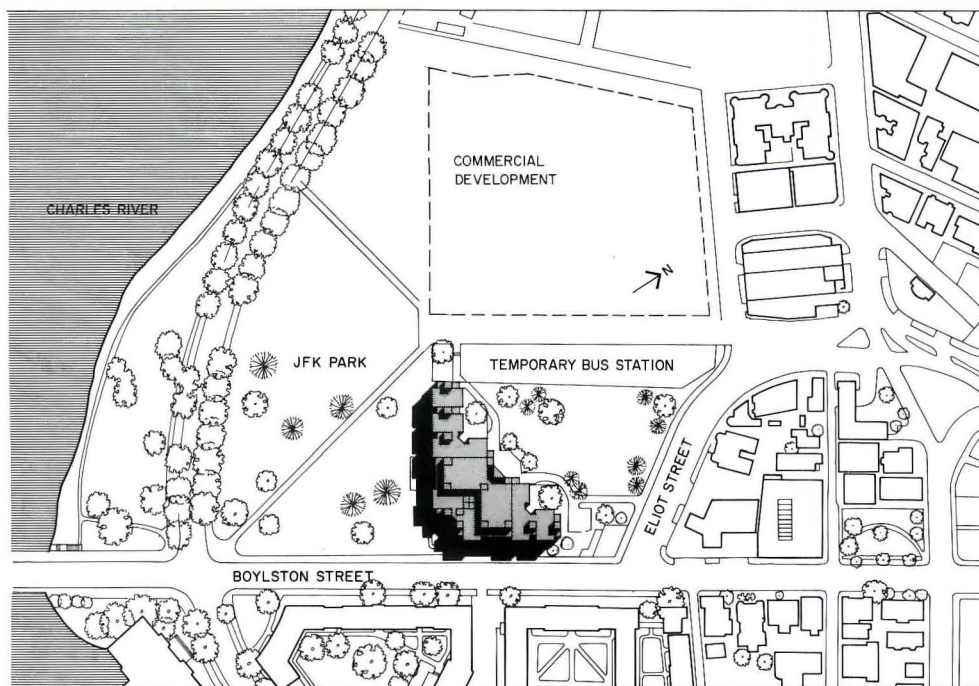


# THE KENNEDY SCHOOL OF GOVERNMENT: A PURPOSEFULLY NON-HEROIC NEW GATEWAY TO HARVARD

Back in 1964, the Kennedy School of Government was to have been a wing attached to the proposed John F. Kennedy Library (an archive and museum) designed by I.M. Pei. Conceived as a splendid monument to the late President, the entire complex was to fill the 169-acre site now so unpretentiously shared by the new School of Government, a memorial park and a proposed commercial center. Two schemes by Pei were abandoned by the Kennedys because an aroused citizenry feared the impact of such a large complex upon the Cambridge environment. The design of the School then went to architects James F. Davies, Joseph Maybank, Robert N. Nizel, Henry S. Reeder, Jr., Colin L.M. Smith and Arthur Cohen of Architectural Resources Cambridge, Inc. Their scheme is quite low key by contrast to its ambitious beginnings. Now that heroic architecture is in eclipse, the new building seems to be just right. —*Mildred F. Schmertz*

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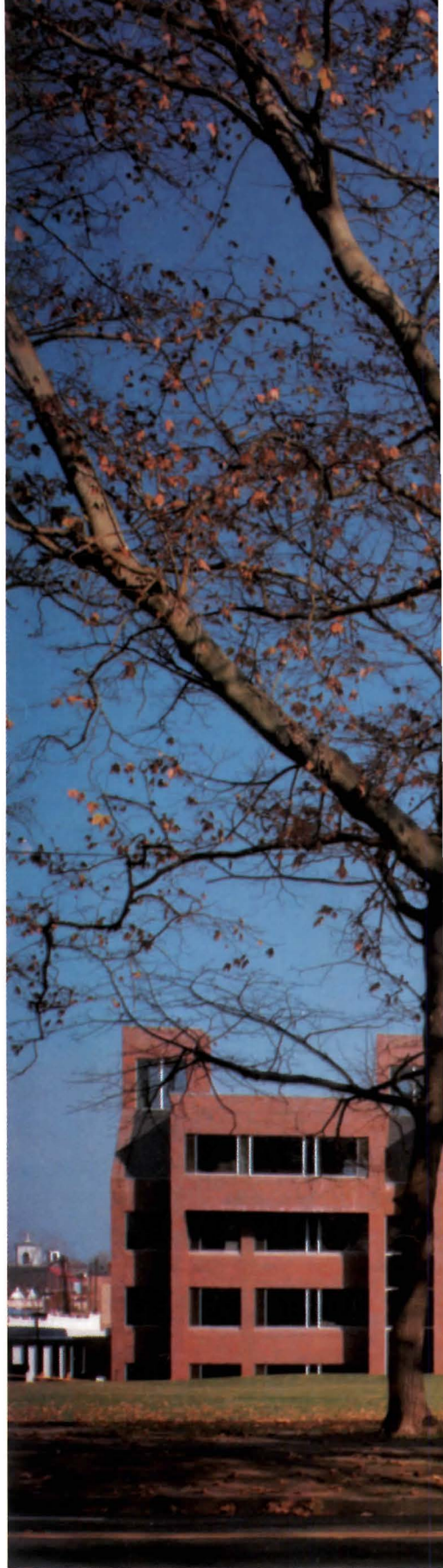
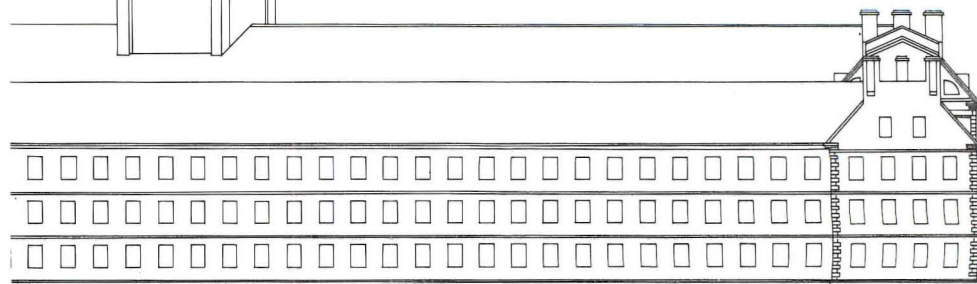
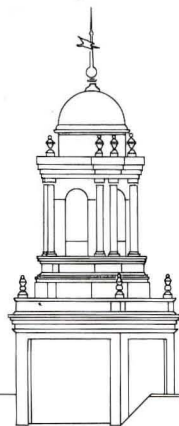
"When Jack was an undergraduate living in Winthrop House and competing in sports against other houses with Yankee names like Eliot, Lowell and Kirkland, he never dreamed that one day there would be a building named Kennedy on this campus."—Senator Edward M. Kennedy at the dedication last October of the new home of the Kennedy School of Government.

The building named Kennedy is not the brilliant memorial the late President's family had hoped for. Acceding to public pressure against the Library, they withdrew it from Harvard and gave it to the University of Massachusetts. A new design by Pei under construction on that university's Harbor Campus at Columbia Point in Dorchester is now three-quarters complete. But the Kennedys got what must have been the most important thing to them—a building named Kennedy at the gateway to Harvard in Cambridge. It faces the Charles River across a commemorative park dedicated to President Kennedy (site plan above and photo right). The park assures that another building won't be built closer to the river, pre-empting the new school's gateway status. The Kennedy School of Government faces Boston across the Lars Anderson Bridge, and Eliot House across Boylston Street. Irish Kennedy and Yankee Eliot form the portal of the University. The Ambassador to the Court of St. James would have been proud.

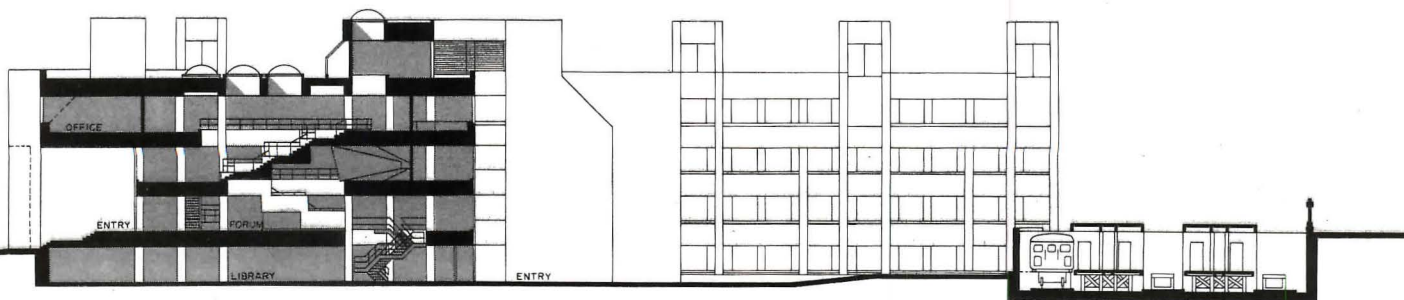
The Yankee half of the gateway demands living up to. Eliot House and its neighbor Kirkland House are vigorous examples of the confident eclecticism that was to end in the early thirties. Their architects used Harvard's little 18th-century Georgian buildings as models for the giant new colleges. The buildings have lovely red brick walls covered with ivy and are richly dormered, corniced, chimneyed, cupolaed and weather vaned.

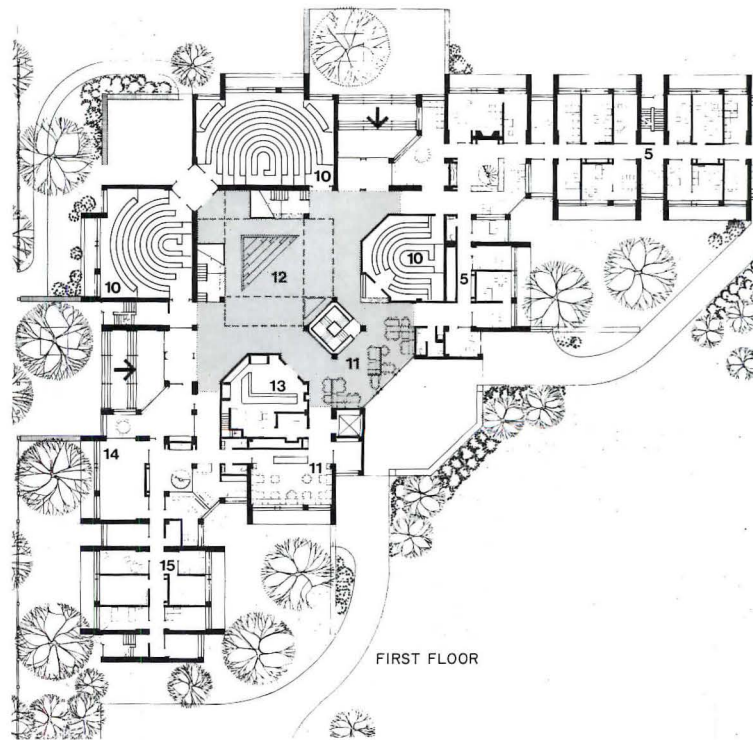
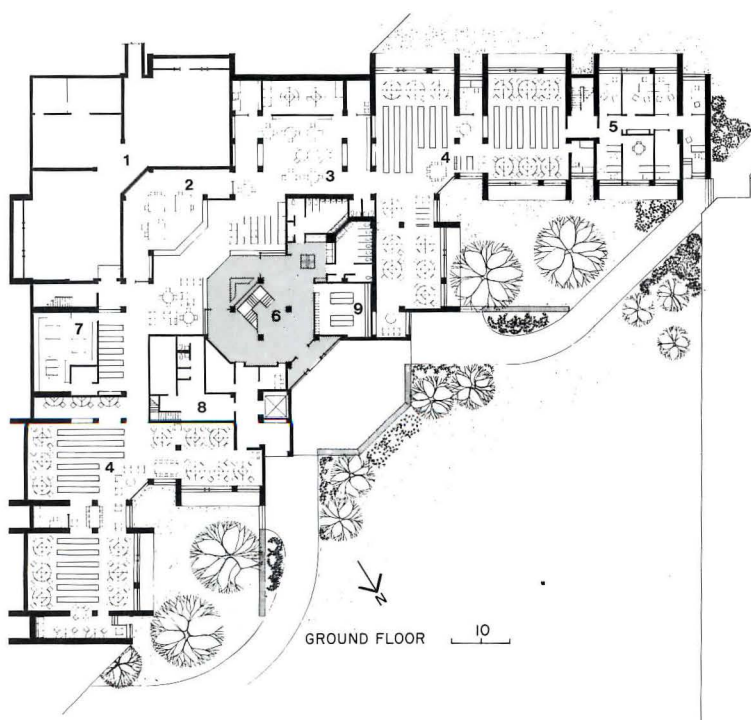
How could the Kennedy half, now bereft of Pei's monument, hold its own? The young men of Architectural Resources Cambridge, Inc. had of course resources. They could have taken their cue from other contemporary Harvard buildings—Le Corbusier's Carpenter Art Center, John Andrew's Gund Hall or Sert's Undergraduate Science Center, thus choosing an esthetic which springs from advanced building technology.

They chose instead to build quietly in traditional Harvard brick, respecting the cornices and banding of Eliot and Kirkland as the elevation indicates. They made the roof silhouettes of their building as interesting as they could by using clerestory monitors which light stairwells and work spaces, but as importantly echo the nice complications of the Eliot and Kirkland chimneys. The roof profiles of the end walls and one-module bays are of pitched slate recalling the sloping roofs which shape the end walls of the thir-











©Steve Rosenthal

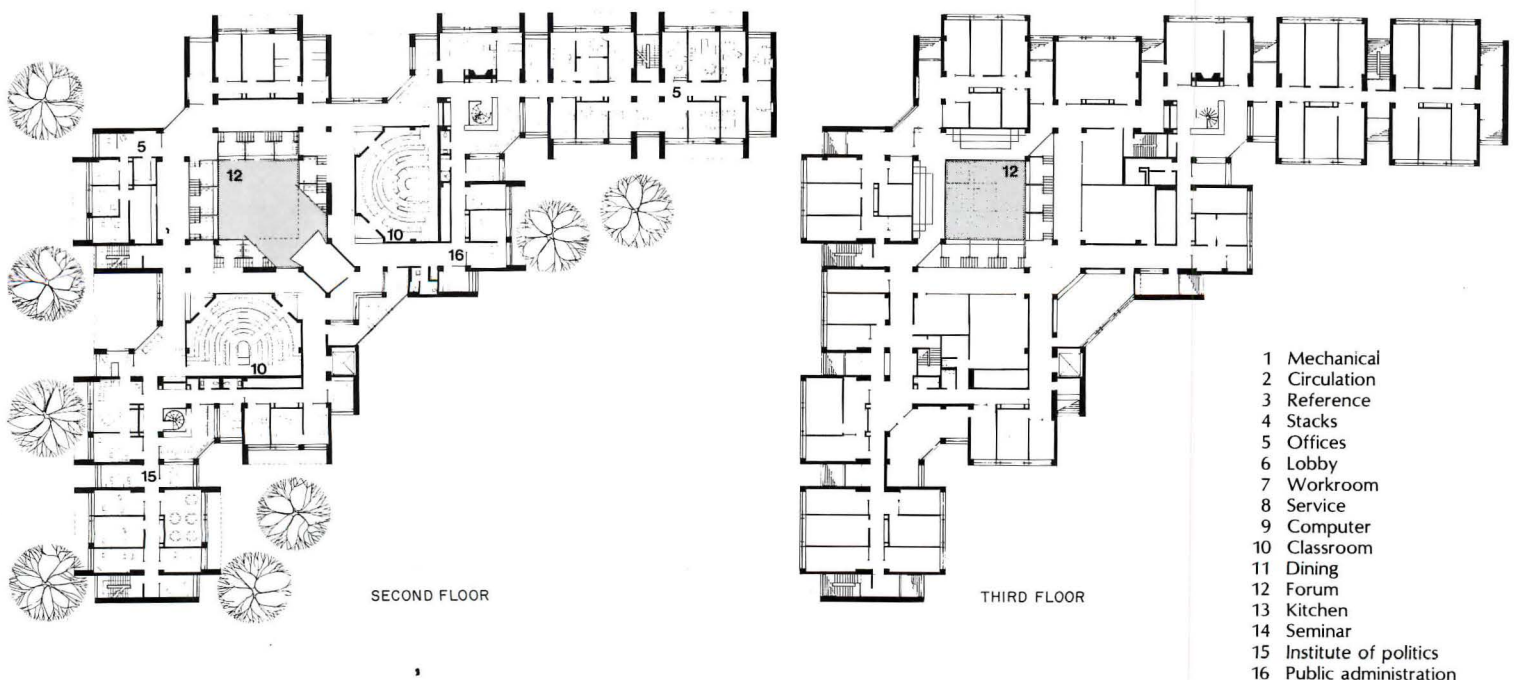
ties colleges. On each facade, three-module bays framed by single spans of structural steel project beyond the one-module bays, catching the sun, casting shadows, keeping the building from appearing monolithic and bringing it to human scale. These means are the contemporary equivalent of the ornament and details of the Neo-Georgian structures.

Harvard also wanted a quiet building which would be in harmony with the Neo-Georgian colleges. The new structure combines the John F. Kennedy School of Government (formerly the Graduate School of Public Administration renamed in 1966) and the Institute of Politics (established the same year with a \$10 million endowment from the Kennedy Library Corporation). The faculty had become accustomed to almost domestic quarters, some located in recycled houses

throughout the University. In this spirit, as the plans below indicate, faculty offices and research areas are clustered in units of six bays each, bisected by a corridor. These clusters are interrelated through the shared use of library/conference areas and kitchenettes connected by circular staircases. Combinations of these clusters correspond to the various disciplines within the school. Thus each discipline has its own "house" offering the sense of intimacy and community the faculty hoped for.

This building is one of the most quickly erected and cost effective in recent Harvard history. The fast-track method brought it to completion in less than two years time and well within the budget. Architectural Resources Cambridge, Inc. commenced design in August 1976. Demolition of the existing

structures began the following January and steel was ordered for the as yet incomplete design. The foundations were begun in June 1977 and steel erection was started the following August. Masonry work commenced that September and by January 1978, the building was enclosed. It was occupied in August 1978 and dedicated the following October. The total cost of the 105,000-square-foot building in 1978 dollars was \$7.25 million or approximately \$69 per square foot, plus \$425,000 for the site. The architects worked in conjunction with Gilbane Construction Company, the Harvard Construction Management Division, and the Kennedy School itself which was represented by former Senior Assistant Dean and Executive Officer Ira Jackson who is now Associate Dean of the School.



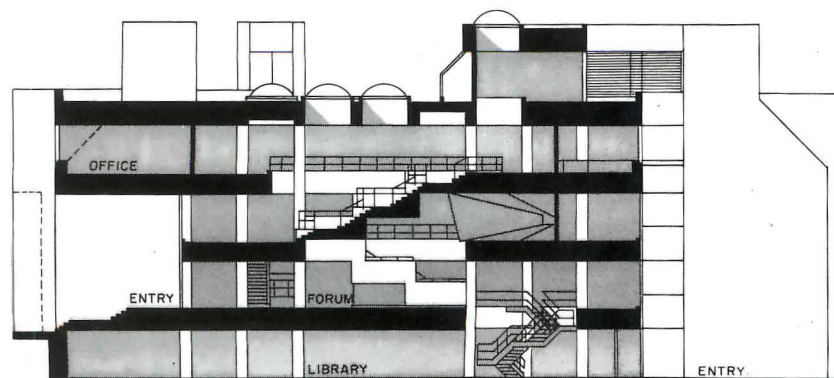
SECOND FLOOR

THIRD FLOOR



The architects sought to give explicit form to the building program's two basic and seemingly contradictory demands—that it be at once an immensely public building and yet a place for quiet individual research. The organization of the private areas into house-like clusters has already been described. The central and defining architectural feature of the new building is the large public forum (cover, above and opposite) which extends upward through the building's five stories. This space was paid for by a \$1,131,280 grant from the Atlantic Richfield Company and is officially known as the ARCO Forum.

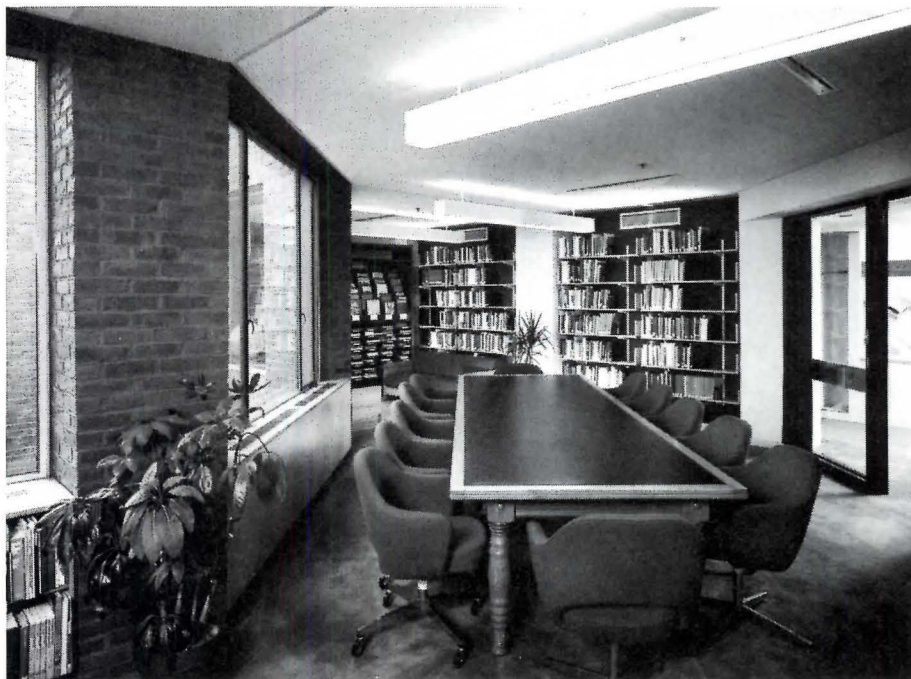
It is a lively place. It provides not only for large-scale public events but also for chance encounters and small group discussions. It is the heart of the building both day and night. During the day it is a crossroads presided over by students and faculty informally talking or studying in the various balcony perches. It is adjacent to a cafe on the ground floor and the other major shared spaces—the library and classrooms. A 63-square-foot television screen elevated in one corner beams news tapes, special programs, movies and debates as well as commercial programming. In the evening the space has functioned like a town meeting hall (movable, storable seats accommodate 500), but has also been a disco and a ballroom. The room has a sophisticated audio-visual system which facilitates video-taping.





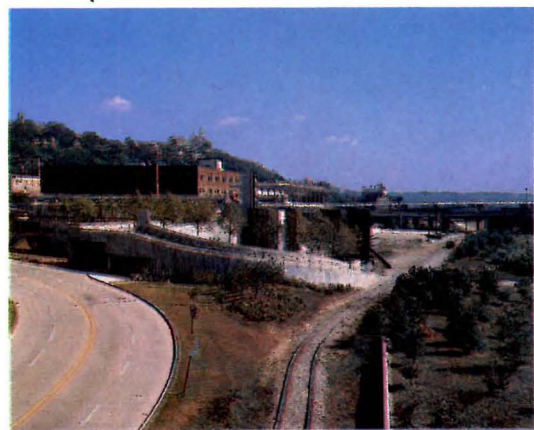
A conference area (right) and a classroom (below) are adjacent to the forum.

KENNEDY SCHOOL OF GOVERNMENT, Harvard University, Cambridge, Massachusetts. Owner: *Harvard University*. Architects: *Architectural Resources Cambridge, Inc.*—principal-in-charge: *Colin L.M. Smith*; project planner: *James F. Davies*; project architect: *Henry S. Reeder*; project designer: *Joseph Maybank*; project team: *Richard Hansen, Russell Mecredy, Vladimir Petrovich, William Powell, Timothy Reny, Wendy Saltonstall, Jayne Smith, Been Zen Wang*. Consultants: *Le Messurier Associates/SCI (structural)*; *Haley and Aldrich, Inc. (foundations)*; *Shooshanian Engineering Associates (mechanical)*; *Thompson Engineering (electrical)*; *L.G. Copley Associates (acoustical)*; *David H. Kaye (audio)*; *Crabtree Associates (kitchen)*; *Moriece and Gary, Inc. (landscape)*; *James E. Gui (specifications)*; *ARC, Inc. (graphics)*; *Joan F. Sprague (interiors for ARC)*; *Olive Holmes (interiors for Harvard)*; *Robert Wood (library)*. General contractor: *Gilbane Building Company*.



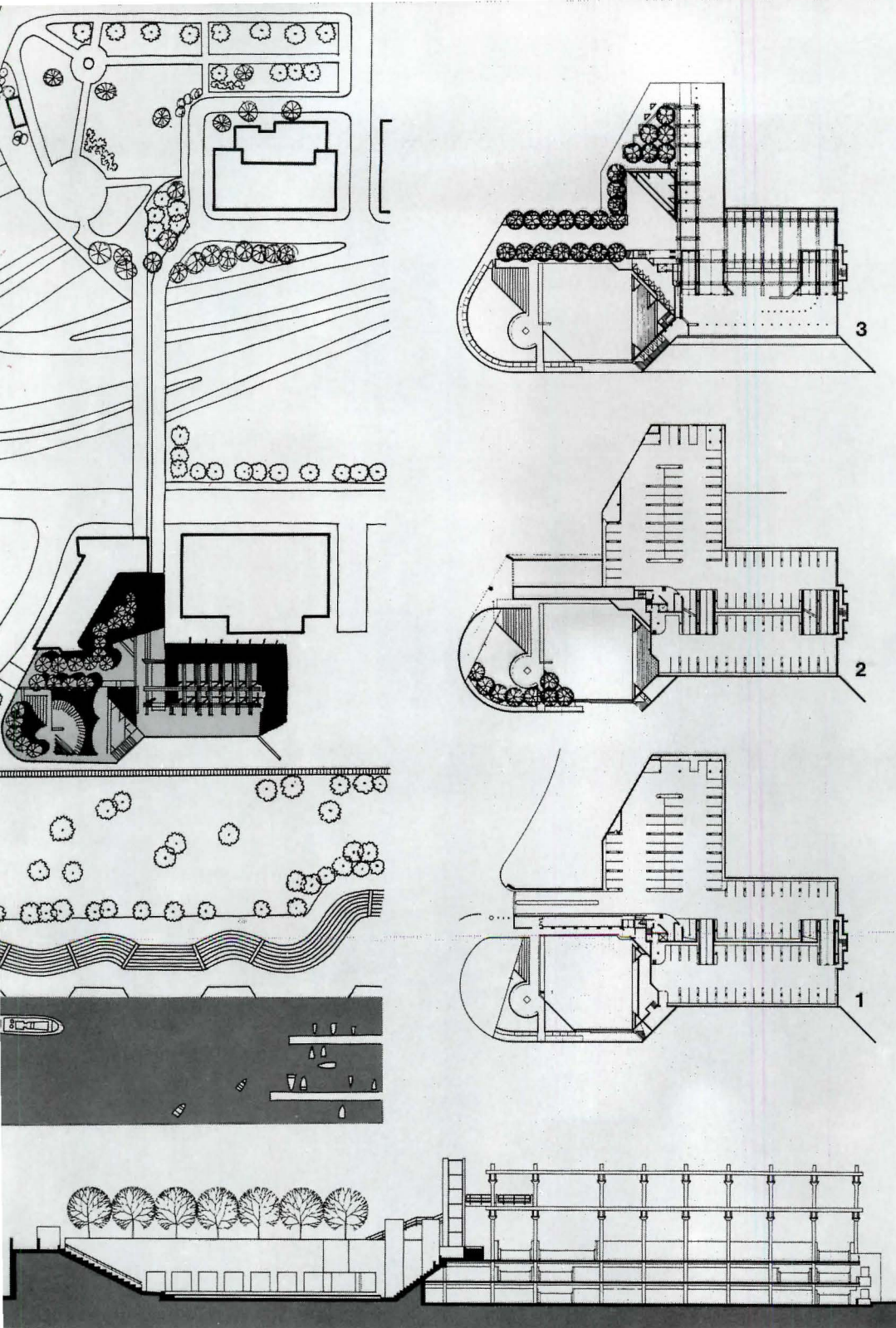


Robert Lautman photos except as noted



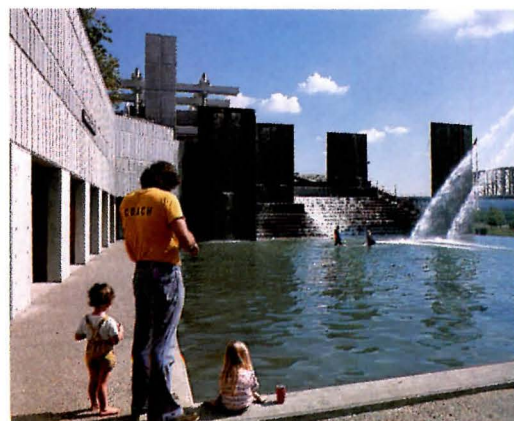
## Cincinnati Concourse and Forum

A delightful urban park by Louis Sauer Associates reunites Cincinnati's central business district with an isolated, under-utilized section of the city's splendid riverfront.



Cut off by a major arterial from the central business district, sections of Cincinnati's riverfront had gradually slipped into the familiar pattern of less and less use until city officials, determined to redeem these potentially valuable properties, embarked on an ambitious program of reclamation. In order to encourage public use of one such area, they commissioned Louis Sauer Associates to design a rather complex amenity: a recreational concourse and plaza that, when complete, will string together a large riverfront complex: shops, restaurants, and a residential tower that is now under construction on the site's northwest corner.

The new park is tied back to the central business district at several points but most importantly by a combined pedestrian and vehicular bridge that spans the expressway. Pedestrians arrive at a broad elevated plaza that overlooks the river while automobiles are collected in a 200-car parking garage under the plaza. From the plaza, pedestrians descend into an enchanting urban garden of trees and shrubs, of sculptured concrete masses, of terraces and stepping stones, of waterworks developed in a variety of ways. These are "people spaces" of a sophisticated character; spaces that almost demand the viewer's active participation; spaces that are







designed to seem incomplete, like an empty stage set, without that participation.

Water, of course, is a remarkably adaptable design medium and Sauer has used it in a range of expressions from static and serene to active—even aggressive. At the lively end of this spectrum is a huge water cannon (photo above) that fires volleys of spray in changing patterns through an adjustable cluster of nozzles.

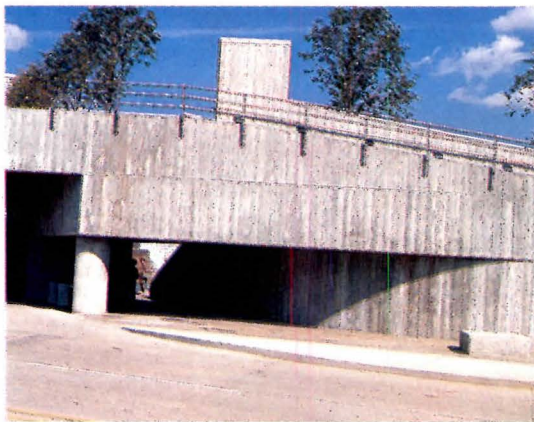
Water is also a powerful recruiter. In warm weather, citizens—some who might otherwise be opening hydrants—stream to the site, shedding their shoes to wade, to refresh their faces, and a few to test the force

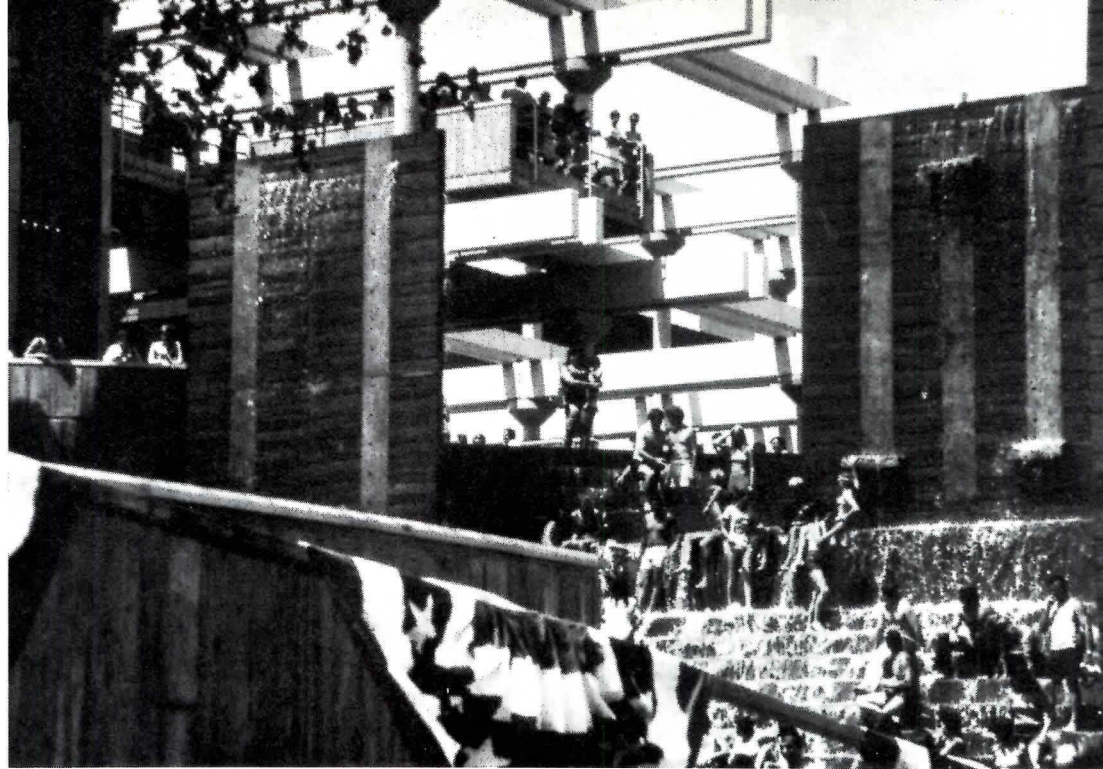


of the water cannon itself. The stepped cascade, which carries water from the four concrete towers down to the lower level pool, is designed quite specifically for use by bathers (photo upper right). On more than one occasion, the park has been so popular that health officials have been forced to close it down temporarily to thin out huge crowds.

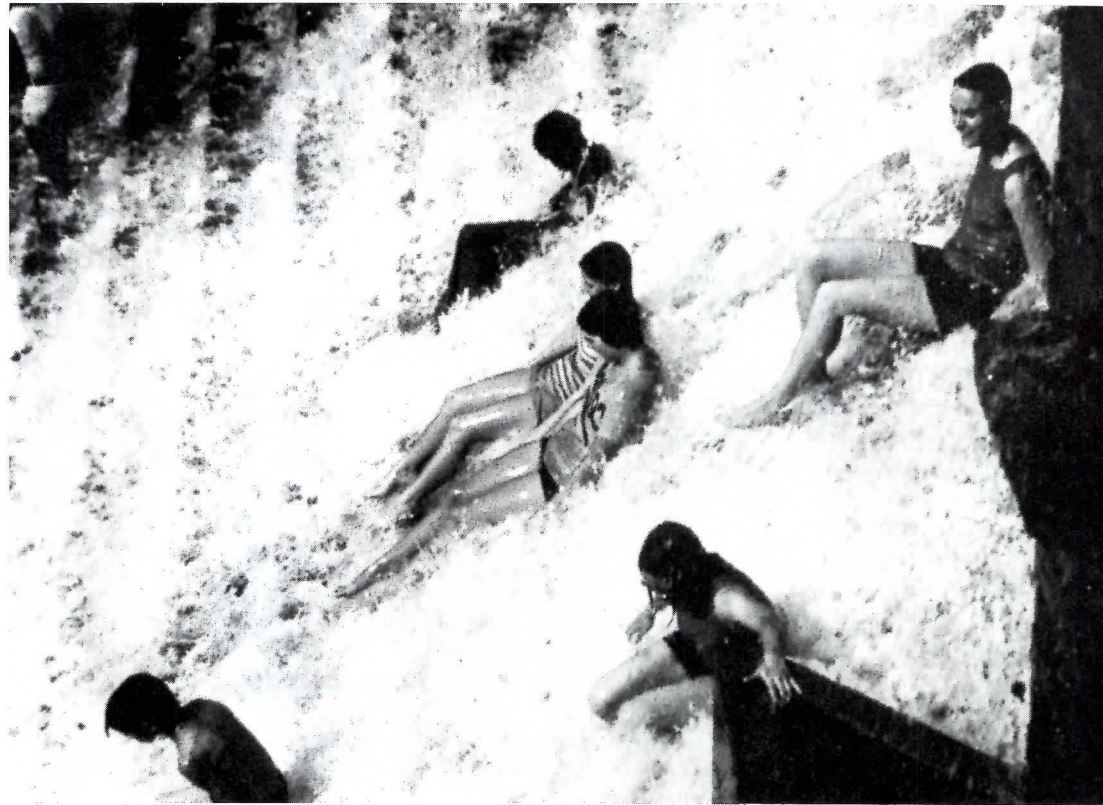
Around and through this watery landscape are ramps, grassy berms and built-in street furniture to which participants can retreat when *the urge overtakes them*.

At the east end of the site, a large and powerful concrete trellis signals arrival and





Louis Sauer



Louis Sauer

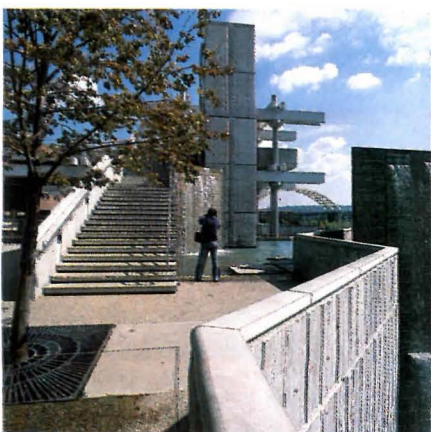


echoes faintly in its form the structural vocabulary of nearby bridges that span the Ohio River. It is here in this processional space that rows of shops and restaurants will soon add another dimension to the project and serve the adjacent residential community. The trellis structure can expand eastward in modular increments as new demands may arise.

In mid-fall, when the waterworks are shut down, the character of the park changes, of course, but it remains until the onset of really cold weather an active playground and significant urban magnet. Completed just over a year ago, at a cost of about \$3 million, the park has been enormously

popular with a wide range of ages and income groups and makes an important contribution to the life of the city. It is a design that dares a great deal, and a design with many lessons for architects, for sociologists, for all those—whether professional or not—whose interest is the urban habitat.

CINCINNATUS FORUM, Cincinnati, Ohio. Architect: *Louis Sauer Associates*—*David Brossart*, project architect. Engineers: *Bernard Schwartz & Associates* (structural), *Maxfield, Edwards & Backer* (mechanical/electrical). Urban sociologist: *John Zeisel*. Consultant: *Ralph H. Burke* (parking). Contractor: *Frank Messer & Sons*.



The geometry of the plan and the sculptured forms through which the water plays have about them certain elements of fantasy, but each form and plane has a clear functional purpose and all are combined in a design of unusual strength, unity, and conviction.





© Nick Wheeler photos

# A laboratory of ideas

## Francis Mah's own house in Memphis

Perhaps no project can cause an architect so much difficult consideration (or final joy) as his or her own house. It is a commission without the limitations, and consequent design directions, usually imposed by clients. While this fact alone can cause enough worry, the resulting freedom of choice produces a definitive result for the judgment of peers and potential clients. Architect Francis Mah—despite a well-proven track record as a designer—was not exempt from a long period of worried thought on the subject, thought that produced a formula for being his own client: The house would become a laboratory for testing some of his own long-held ideas about the general nature of what houses should be.

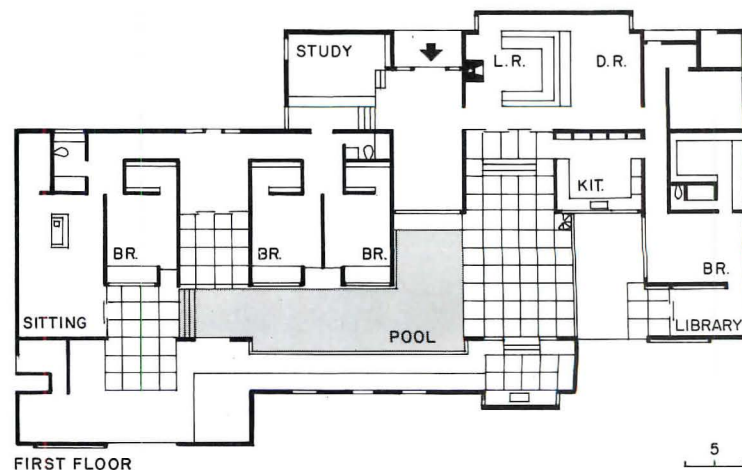
Located at the end of a long drive through pleasant woods, the Mah house seems serenely isolated from the densely-built Memphis suburbs that surround it. In fact—the neighbors are only a stone's throw away. The site is a long narrow ravine, subject to seasonal flooding, and Mah has turned a potential defect into an asset by simply diverting the periodic waters. Partially because of the closeness of the neighbors, the house looks inward, so that few of the areas have views directly to the outside. Instead, there is an elegant flow of space from most of the "traditional" spaces into a vast enclosed space that seems to be outdoors. Mah describes the concept as a house within a house.

There are other reasons for the concept than avoiding the neighbors' stares. In the spirit of testing ideas, the house first saves fuel through passive solar heating. The roof of the "outdoor" space is translucent plastic, which allows an enormous heat gain during sunny winter days. In a climate that can be harsh, tropical plants thrive year-round. The effect on "the inner house" is a fuel bill that can be a third that of a conventional house. Another idea that Mah is testing with his house is an alternative to traditional concepts of what is marketable. Surrounded by new houses that derive their forms from doubtful tradition, Mah has let his house derive its strong identity from its concept. And—as in all good laboratories—he is constantly fine tuning to effect a desired and eminently affordable result. —C.K.H.



Because over half of the area is heated by passive solar means, architect Francis Mah has been able to build his own new house so that it is both dramatically spacious and economical in construction and maintenance. While there are over 7,000 square feet of area, approximately half of that area takes the form of the vast garden room seen in the photos here. Neither insulated nor mechanically heated, this area (and Mah's own do-it-yourself work on construction) helped to bring the average cost of the whole house down to \$10 per square foot. And the garden room acting as a solar collector is not only independent for its own

heat, but it contributes strongly to the heating of the conventionally enclosed parts of the house as well. Another cost-saver is the use of economical materials frankly exposed to view, such as the corrugated metal roof. The wood-frame construction has a stucco finish on walls and the rough-sawn roof construction is left exposed within the interior, as the "outdoor" space acts as insulation. As seen in the photos, this space extends over the interior in the form of a loft. The concrete floors have been stained and are highly polished. Aided by a profusion of space and a truly grand scale seldom found in this







"think-tight" era, the ordinary takes on a lavish quality. It is really the flow of space that sets this house apart. The end effect is a timeless environment which Mah has heightened by the use of retrieved parts of older buildings, such as the entrance door and the mantle (see photos). While Mah may not have consciously set out to challenge the closed-in spaces and dubious style of many of the suburban houses around him, he has clearly shown that a truly fresh house can have both an indigenous and highly

appropriate character. He has shown that such a house can be built of economical local materials, and that it can be what the others miss: undeniably elegant.

MAH HOUSE, Memphis, Tennessee. Owners: Mr. and Mrs. Francis Mah. Architects: Walk Jones & Francis Mah, Inc. Engineers: Reeves Engineering (structural/foundations/soils); Herschel L. Powell & Associates (mechanical/electrical). General contracting by the architects.





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Shiny new high-tech interiors create a bright image  
(and a high efficiency level) in a warehouse shell for

# MERVYN'S

a fast-moving California clothing merchandiser



*Russell Mac Masters photos except noted*

Like headquarters for retail garment businesses in all parts of the nation, Mervyn's California headquarters combines management and clerical functions with a high degree of industrial-style traffic—a bustle of clothing racks being wheeled for the buyers' inspection; and crowds of supermarket-style carts carrying voluminous amounts of samples and paper for the promotional art department, for the credit areas, and for the computer operations. Further, Mervyn's is a fast-growing chain, with constantly changing space needs. Faced with these complex and contradictory "images," architects Gensler and Associates have chosen to recognize the industrial side of the operation in both appearance and planning that complements the industrial origin of the building itself—a remodeled warehouse. And the end result has achieved what no less straightforward approach could: a truly efficient workplace coupled with a truly elegant environment.

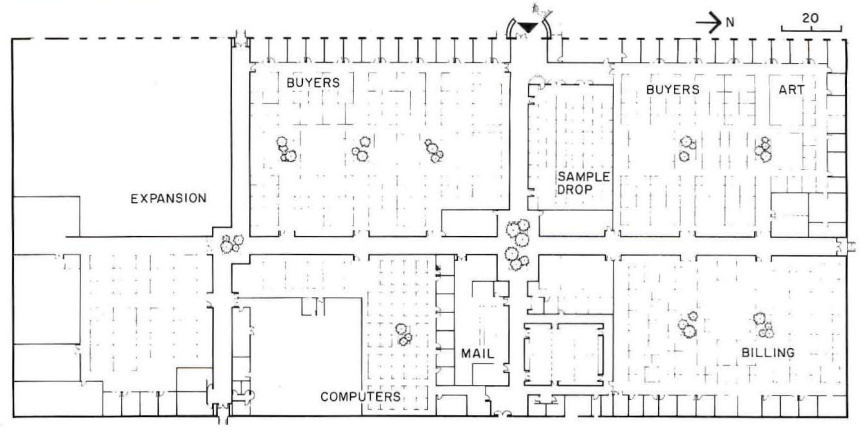
*In organizing corporate needs within the 600-foot-long, 140,000-square-foot existing space, Gensler and Associates realized that the first priority was to keep the inhabitants from getting lost—or at least disoriented. Not only was all of the space to be on the one rectangular floor of what had been a distribution warehouse, but that floor lacked any variation in plan or height and largely even lacked windows. Resisting an urge to divide this space into more intimate, visually-isolated sections, the designers called for six large flexible rectangular floor areas connected by straight-line corridors that provide a clear visual orientation. But in the hands*

*of the less skilled, these corridors also could have provided an uncomfortable sense of agoraphobia and/or boredom that does not exist. What would have been the high narrow proportions of the corridors have been altered by baffles (photo below right). These diffuse the fluorescent light from above, and provide visual breaks in the linearity of the space. Acoustically perforated metal paneling has been sprayed with automobile lacquer in a variety of colors that define the various kinds of activities behind the walls—as do the different playful shapes that project around doors. Stainless steel pipe rails add another sculptural element, and*



keep carts away from the walls. Skylit "courts" at corridor intersections (photo below left) provide a major change of scale and further break the sense of linearity.

The result of the simple plan is large flexible work areas that meet Mervyn's constantly changing needs (photo overleaf). These big spaces are given definition by large panels of acoustical ceiling tile and light fixtures hung 12 feet from the floor and by skylit areas that are similar to the courts at corridor intersections. Most of the office areas are open plan, and are furnished with a standard furnishing system that includes flexible electric outlet

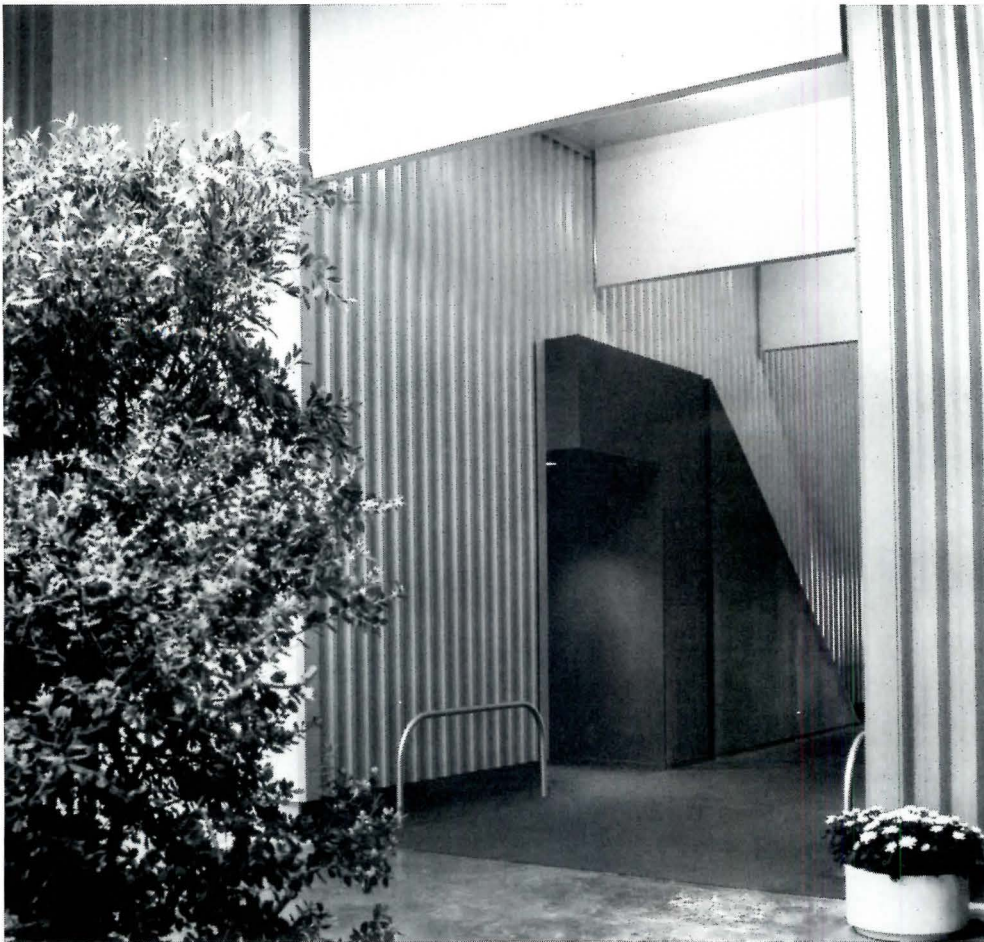


Burns Becker Burns



locations and variable-height partitions. Basic services such as mail distribution are clustered at the center (photo below) of the four out of six work areas that are currently in use. And the other areas should see action soon.

MERVYN'S HEADQUARTERS, Hayward, California.  
Architects: Gensler and Associates—project team: Linda Groth, Orlando Diaz-Azcuy, Kerwin Lee, Dave Fridlund, Kay Yamagami, Jim Radin. Engineers: Ira Kessey (structural); Bayha, Weir & Finato (mechanical); The Engineering Enterprise (electrical). General contractor: B.A. Construction.

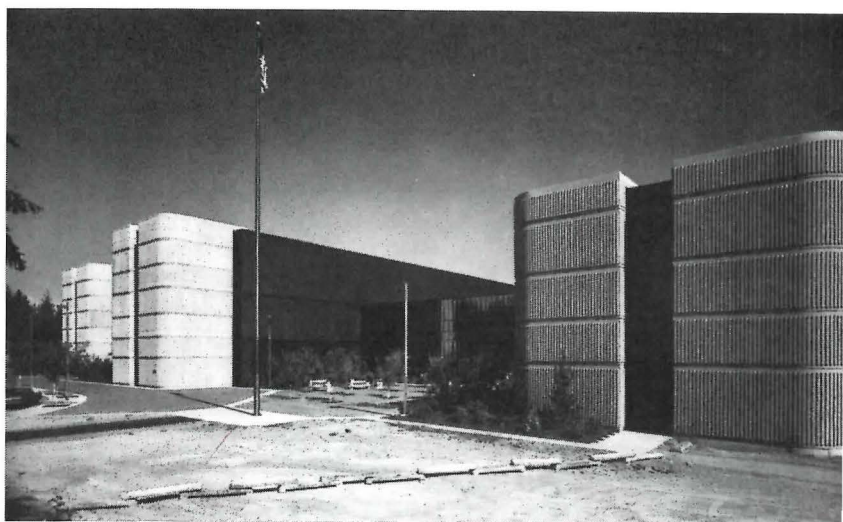


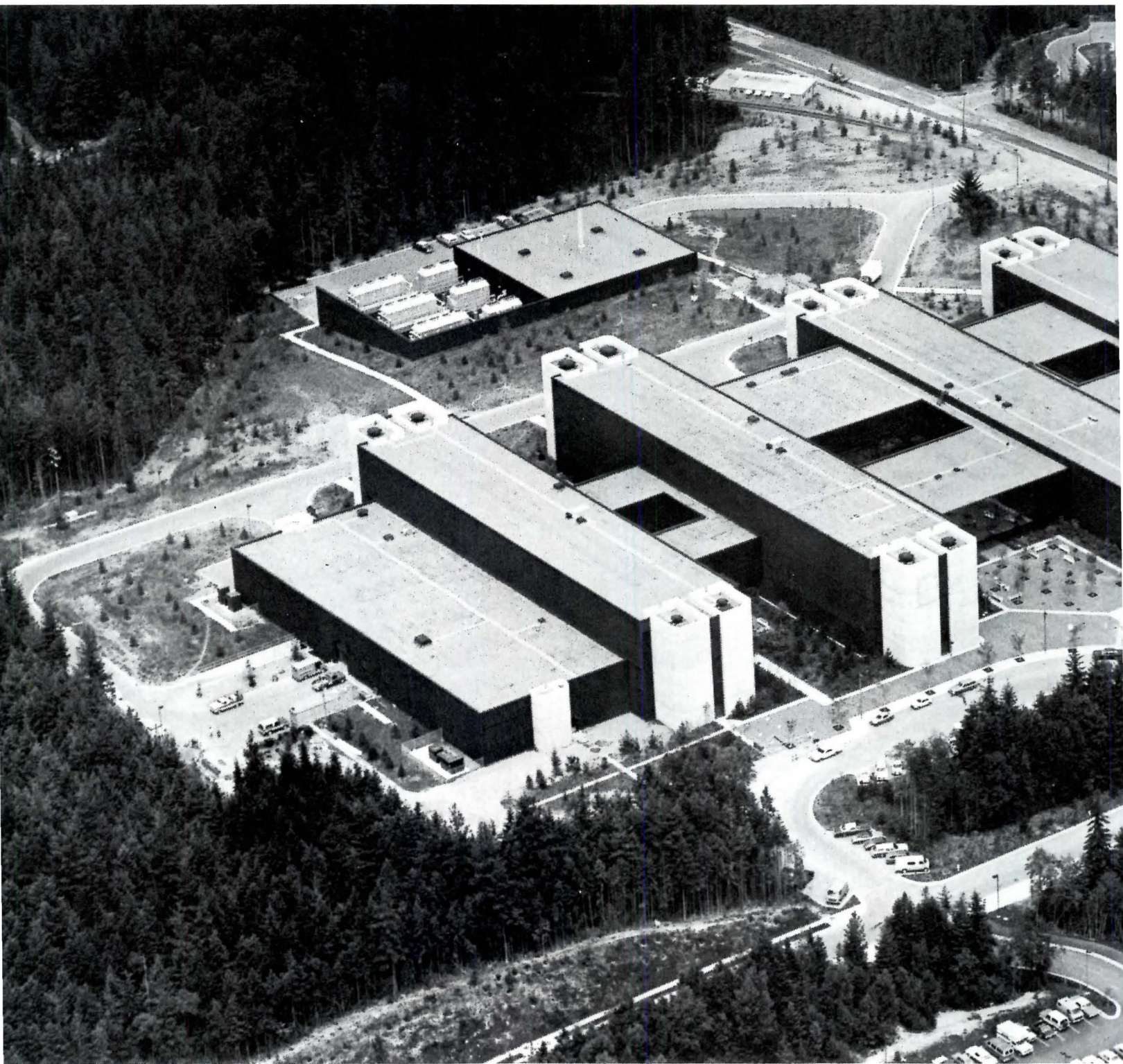


Hugh Stratford photos

## TRIDENT SUBMARINE TRAINING FACILITY

Turning the tide on the image conjured up by the old saying that the Navy paints *everything* gray is this handsomely-designed training facility located on the banks of Hood Canal in Washington, for non-commissioned personnel who serve as crew members on *Trident* submarines. The joint-venture team of Tracey-Brunstrom/Ewing/Warnecke created an environment especially conducive to learning by sensitively molding stringent criteria that necessitated an incredibly massive, internally complex structure with rigid security restrictions that could easily have overpowered good design. —Janet Nairn

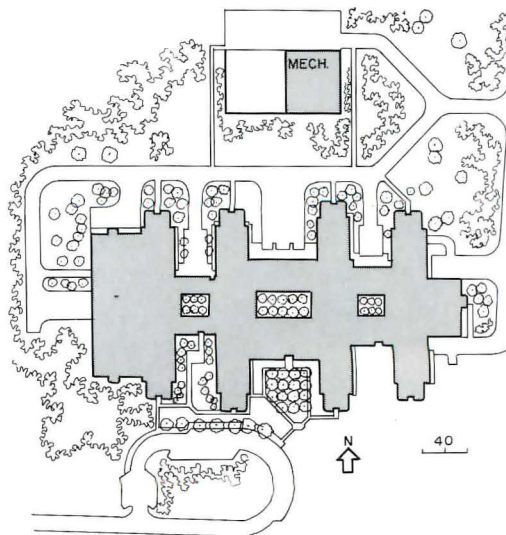


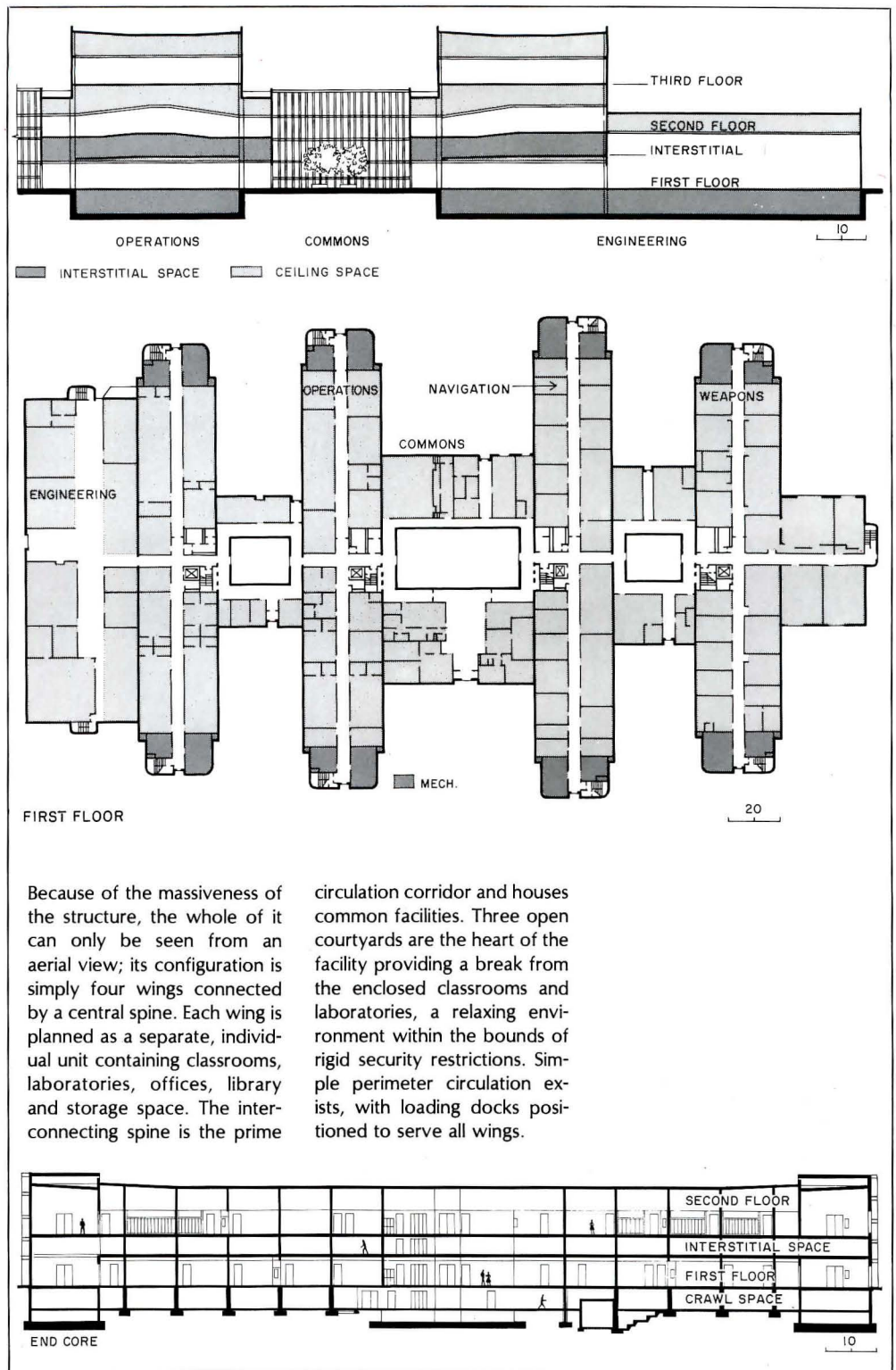
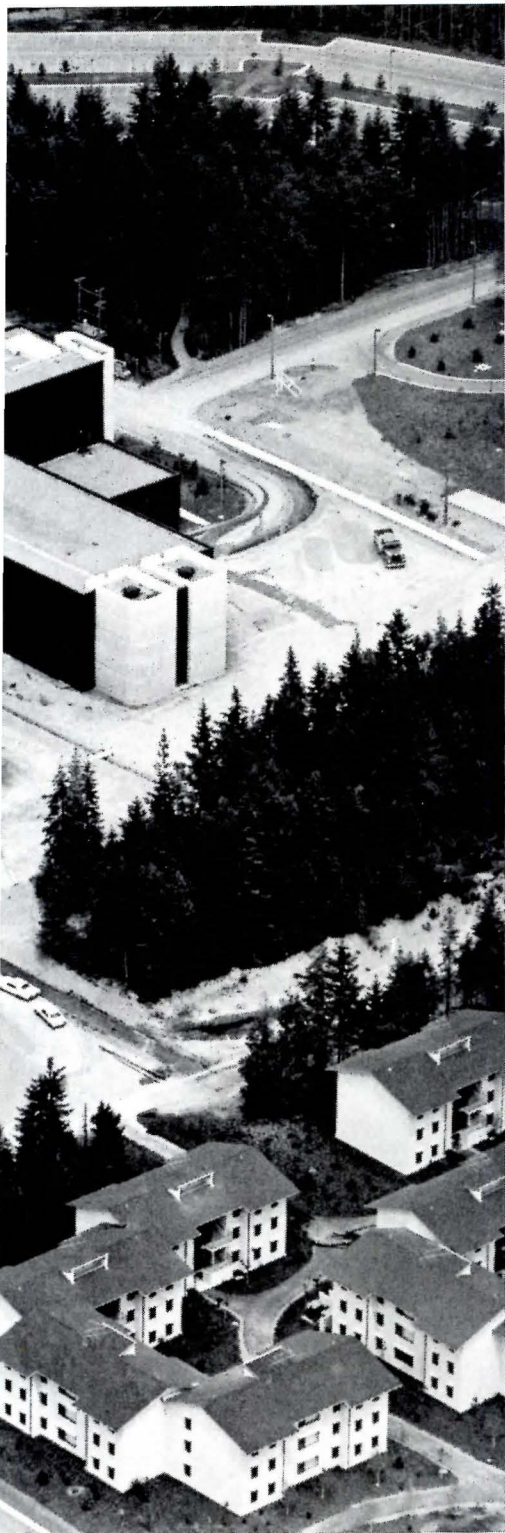


The Trident training facility has a monumental scale—an almost incomprehensible scale—that has been characteristic of only certain kinds of military structures. While the building is only three stories high, with its generally windowless facade (for security reasons) and its size (a total of 400,000 square feet) its immensity is difficult to understand from ground level. Only an aerial view is comprehensive (and particularly the one shown above, with a more humanly-scaled housing project at the lower right-hand corner for comparison). The Navy had complex and stringent criteria that unaltered might have resulted in just another large, rectangular, industrial-looking building. It is, however, the sensitivity of the joint venture team and the Navy people involved that allowed for an

interior system of courtyards and community spaces that make this huge complex a pleasant learning environment.

Even though the Navy began thinking about home base facilities for the new *Trident* submarines in the mid-60s, Congress did not appropriate research and development funds until 1970. It was in the early 70s that the Navy announced its proposed site in the Northwest as home base for, initially, ten *Trident* submarines. And in 1974 the Navy prepared what was to become a highly controversial issue in the Seattle area—the Environmental Impact Statement. A local group called CAT (Concerned About Trident) brought suit over the EIS but the courts ruled in favor of *Trident*. Grading and construction for several projects began as early as 1975





Because of the massiveness of the structure, the whole of it can only be seen from an aerial view; its configuration is simply four wings connected by a central spine. Each wing is planned as a separate, individual unit containing classrooms, laboratories, offices, library and storage space. The interconnecting spine is the prime

circulation corridor and houses common facilities. Three open courtyards are the heart of the facility providing a break from the enclosed classrooms and laboratories, a relaxing environment within the bounds of rigid security restrictions. Simple perimeter circulation exists, with loading docks positioned to serve all wings.

and work is continuing today. The Training Center was completed in late 1977 but the Navy is presently considering an addition to the main structure.

The specific location of the base is 750 acres of the existing 8,500-acre Bangor Base, formerly committed to *Polaris* submarines and as an ammunition storage site, on the banks of Hood Canal in the Seattle area. The joint-venture team was formed from three architectural-engineering firms: Tracey-Brunstrom of Seattle; George M. Ewing Co., Philadelphia-based with offices in Washington, D.C.; and John Carl Warnecke & Associates, with both Washington, D.C., and San Francisco offices working on this project. The building was designed in Washington, D.C., for proximity to the Navy, but as work

progressed the team moved westward.

The concept of the building plan is symbolically based on the organization of a submarine with each of four main submarine operations (engineering, operations, navigation and weapons) housed in a separate wing, and all wings are connected by a circulation spine highlighted by open courtyards.

The structure can be sub-divided into two major distinct sections—the Engineering Operations Training (EOT on plans), composed of engineering and operations wings; and the Strategic Weapon Systems (SWS), including navigation and weapons wings. Each of these two major sections has a common area which contains offices, lounges, storage and loading docks; but the primary area of joint use occurs in the center

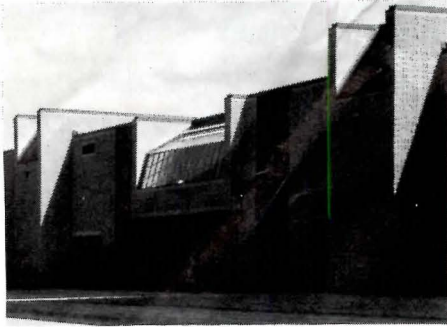
of the structure. This central commons area contains the main entrance and visitors' reception area, administrative offices, auditorium, library, photographic and reproduction rooms and the largest of the open courtyards.

To break up the massing of so large a structure, the building configuration was allowed to express its internal function, weaving in and out as dictated. Each wing is the length of two football fields, and the total lateral length is the same as a *Trident* submarine, 560 feet.

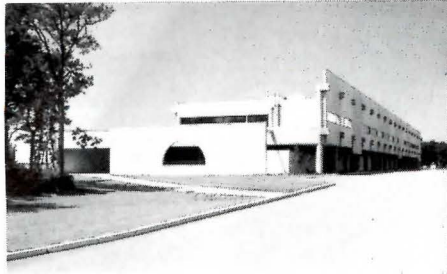
The connection between each of the wings is a series of three open courtyards. This spine is sheathed in reflective glass—reflective to maintain security restrictions and to contribute to the over-all energy conserva-

# SCHOOLS

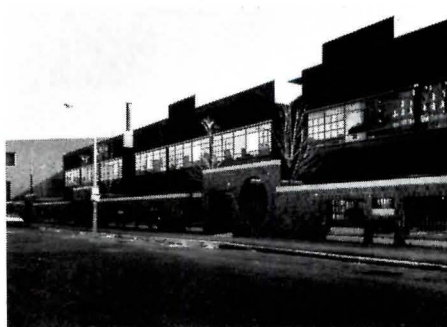
For the past five years or so, conventional wisdom has reported that the construction of primary and secondary schools in the United States was on the sharp decline. This was meant to have been the result of many factors, but most importantly of inflation, which upped the cost, and of a declining student population, which lessened the need. But as is often the case, conventional wisdom was, if not wrong, at least not entirely right, for schools continue to represent a lively segment of the construction industry, having increased in dollar value in 1978 and having been predicted to increase still further in 1979. Recent surveys show, moreover, that well over half the country's architects either are now involved in the design and specification of educational facilities or have been during the past two years. Why? One reason for all of this building activity, clearly, is changing demographics, with more and more schools being needed as various segments of the population move from one place to another. Another reason, equally clear, is that every year a certain number of schools decline into obsolescence—either by becoming physically obsolete, or by having declared obsolete the particular kind of educational curriculum they can accommodate—and these must be replaced. Other less important but still significant reasons are energy requirements, integration requirements, requirements for the handicapped, plus a variety of other regulations that also enforce change, and therefore new construction. It is therefore slightly remarkable, amidst all this activity, that there appears these days to be no great new wave of educational theory that transforms itself into a parallel new theory of school design. Instead, this seems to be a time of modest consolidation, with the innovations of a few years ago making themselves more generally present. Virtually *all* schools now are energy-conscious (or claim to be); virtually *all* of them accommodate broader community activities; and nearly all use some form of the "open" classroom, or at least offer the option. Another innovation of recent years that is becoming more common is the "house" plan, whereby a large school is divided into smaller groups with each group offering all of the grade levels that the school offers. Houses are separate and autonomous for most educational functions, though a collection of special ones is shared by the school at large. The designs on the following pages show how all these and other concerns get woven into real buildings and reshaped by particular circumstances. Granted that schools may not be the most likely building type to seize the architect's imagination, these buildings nonetheless are often highly inventive, and remarkably impressive. They therefore deserve careful study. —Gerald Allen



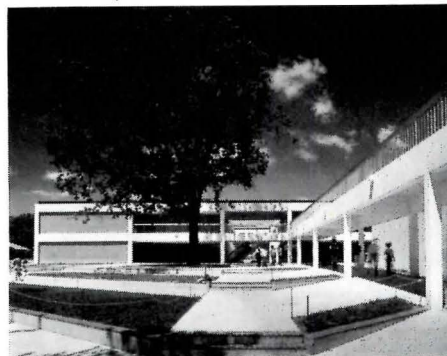
Cumberland Regional High School



Barnstable Middle School



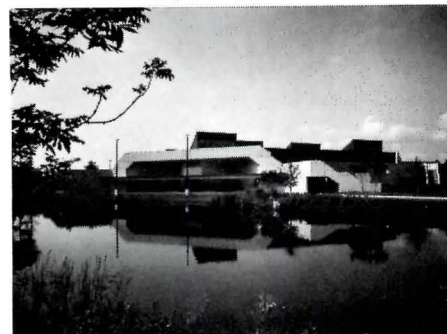
Blackstone Square Community School



Pine Bluff Senior High School



Tri-Center Elementary School



Mayport Junior High School

Nick Wheeler

Steven Edson

Bob Braun

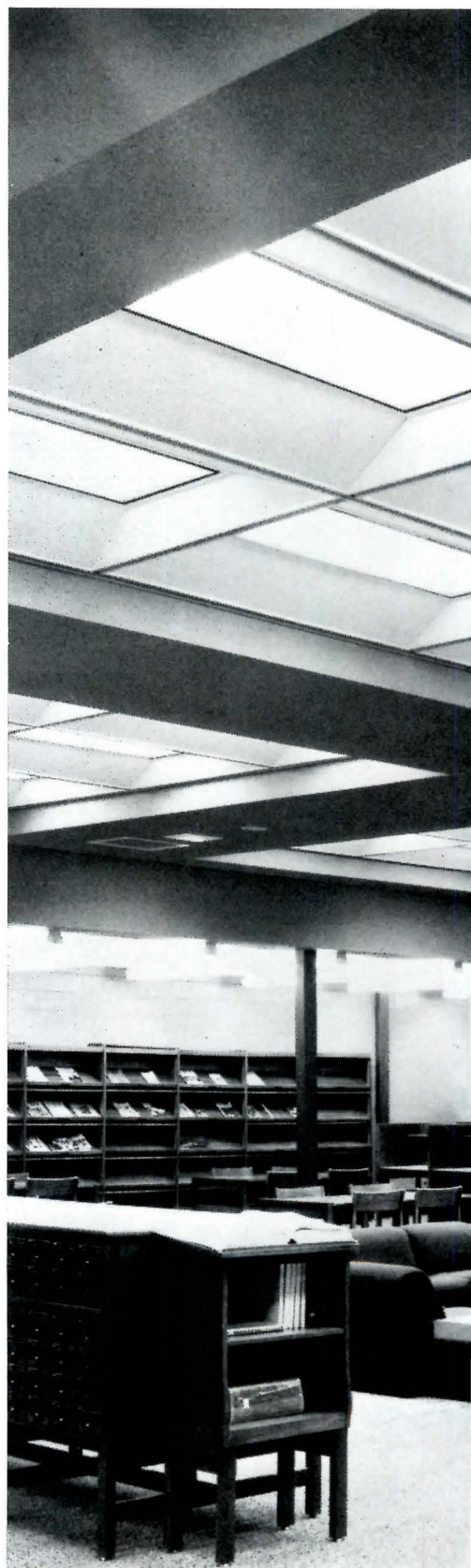
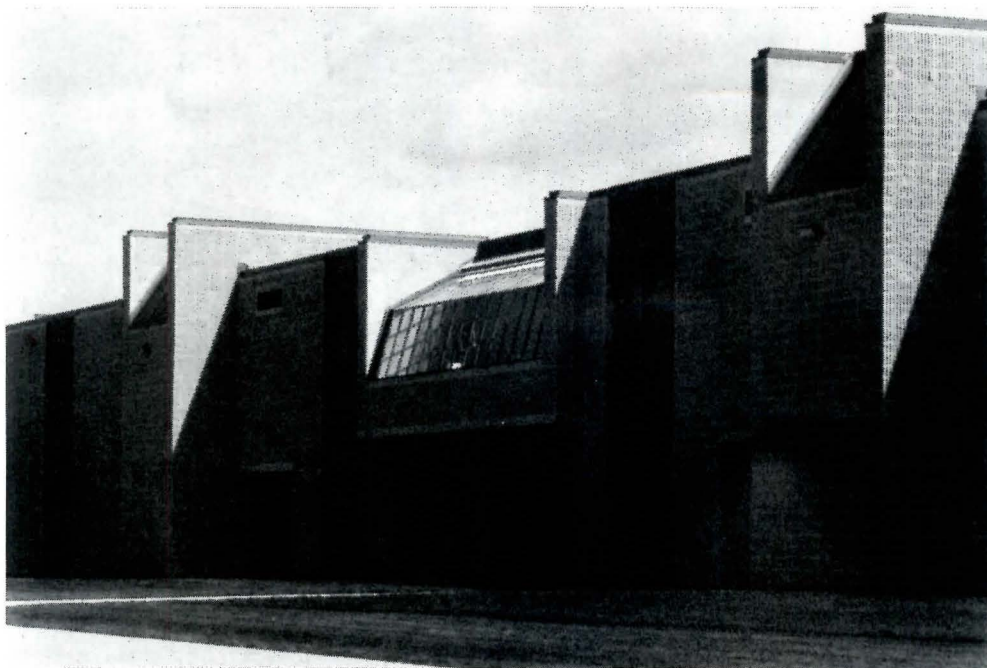


## CUMBERLAND REGIONAL HIGH SCHOOL

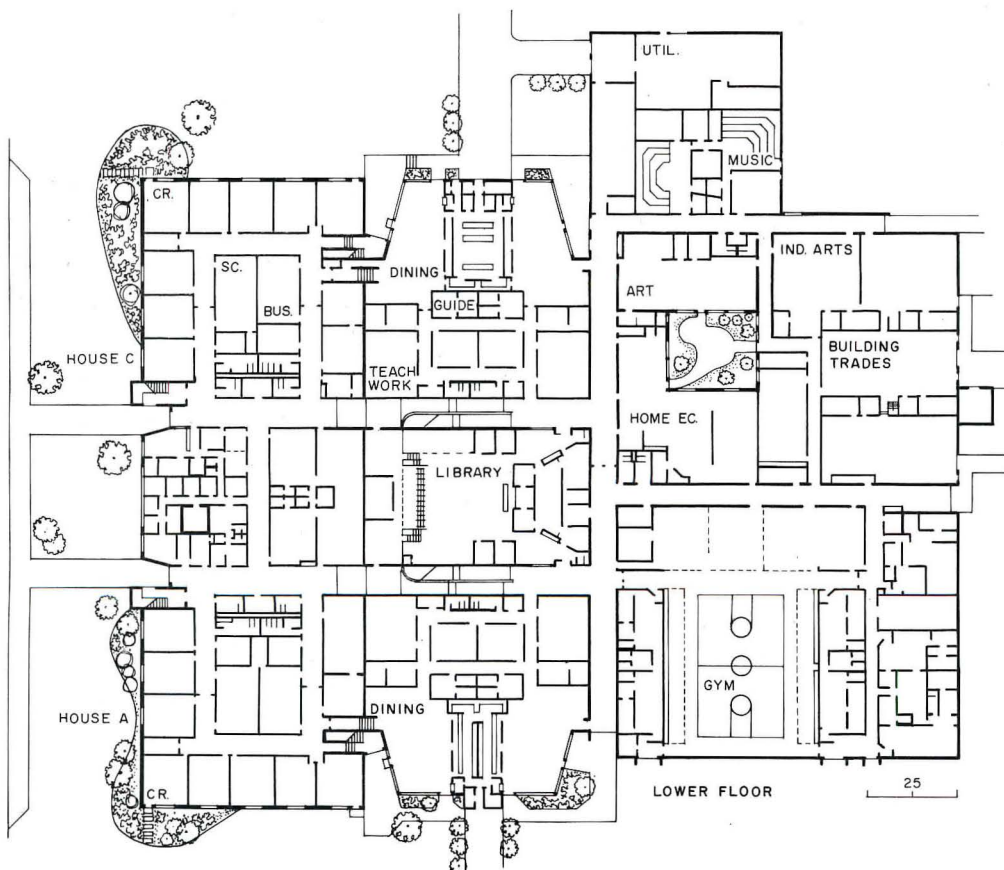
Using a fast-track, critical-path method, the Cumberland Regional High School—a facility for 1,600 to 2,000 students—was designed and constructed in twenty-four months in order to alleviate as quickly as possible the overcrowded school conditions in the district. With the help of state and local experts, a program for the new school was developed in barely two weeks through a series of daily, intensive sessions. Its central concept is that

of "house"—four of them in all, each almost autonomous, each with its own "house master," and each offering all four high-school grade levels. The program was then converted into a schematic design, an implementing referendum was held, and, with the assistance of the project's construction manager, the first of a total of 75 construction contracts for the building were let; working drawings and specifications were produced

as construction proceeded. It was estimated that, in addition to completing the school sooner, this method would save \$750,000 over conventional construction processes, and, according to the architects, it did, with this contingency amount being returned to the local board of education for other uses. The building has foam bat insulation between interior and exterior block walls. The heating system—which is adaptable to the most



O. Baitz photos



The school is sited on a knoll on a 414-acre plot, which also contains a large lawn, two baseball fields, a stadium, and other athletic facilities. The plan below left shows the lower of the building's two floors: two of the independent "houses" are seen at the top and bottom of the left-hand side. The other two houses are on the upper level, and the rest of the building is devoted to spaces shared by all, like the library below.



economical energy source available—uses a heat pump, with steam to generate heat and, reversing the process, to air condition. Proper consideration was given to the control of the thermal, acoustical, and visual aspects of the interior; ninety per cent of the building is carpeted, there are nine-foot-high ceilings with acoustical tile, and there is a subtle series of soft colors throughout. The interior layout, moreover, as in many new schools that are now being built, is almost completely flexible

to respond to changing numbers of students and to changing needs.

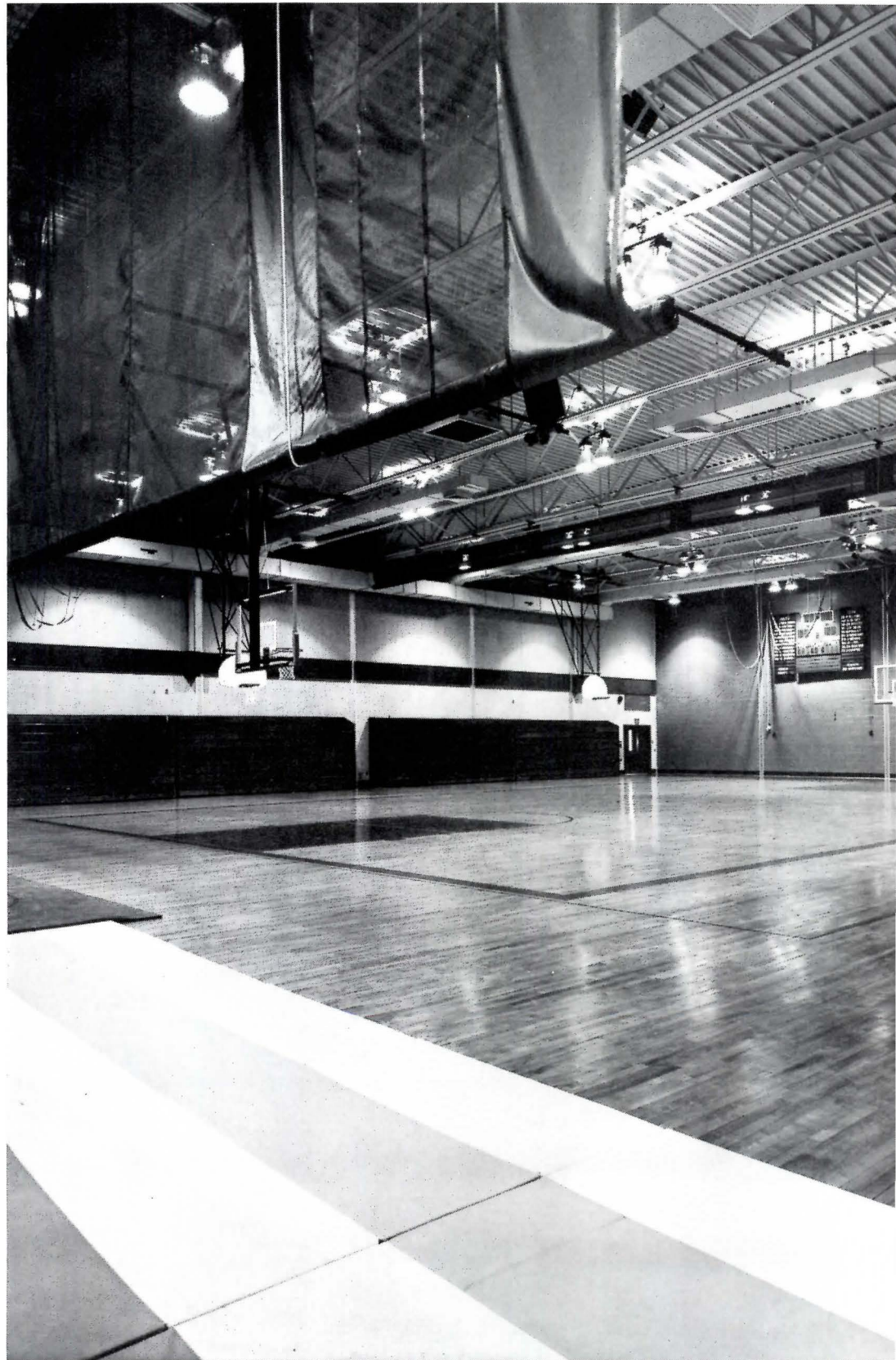
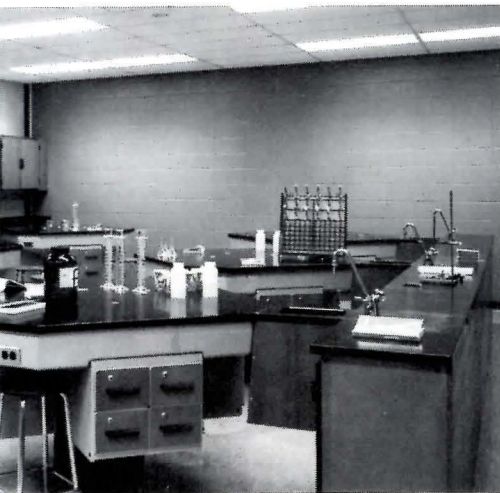
CUMBERLAND REGIONAL HIGH SCHOOL, Seabrook, New Jersey. Architects: *Armstrong Jordan Pease*—partner in charge: *Quentin E. Armstrong*. Engineers: *Paulus and Sokolowski* (structural); *Biro & Associates*, (mechanical/electrical). Construction manager: *HENCO*. Consultants: *Kennedy Associates* (landscape); *William Forest Associates* (food service).

The photograph immediately on the right shows one of the two major ramps, lit from skylights above, that connect the upper and lower levels of the school building. It is designed to be a series of "schools within a school," organized into four separate houses and therefore allowing for better student-teacher interaction and a more intimate educational environment; it also greatly reduces student movement throughout the building.



In spite of the house organization of the school, there are a number of areas that are shared by everyone. These are devoted to special—and usually non-academic—subjects, and students travel from their individual houses to visit them. On the left is the home economics area, and above is the practice room for the band and other musical groups. On the opposite page are a laboratory and the gymnasium. The conservation of energy was an extremely important part of the school's design, using a heat pump for both heating and cooling, with total flexibility as to energy source.

O. Baitz photos



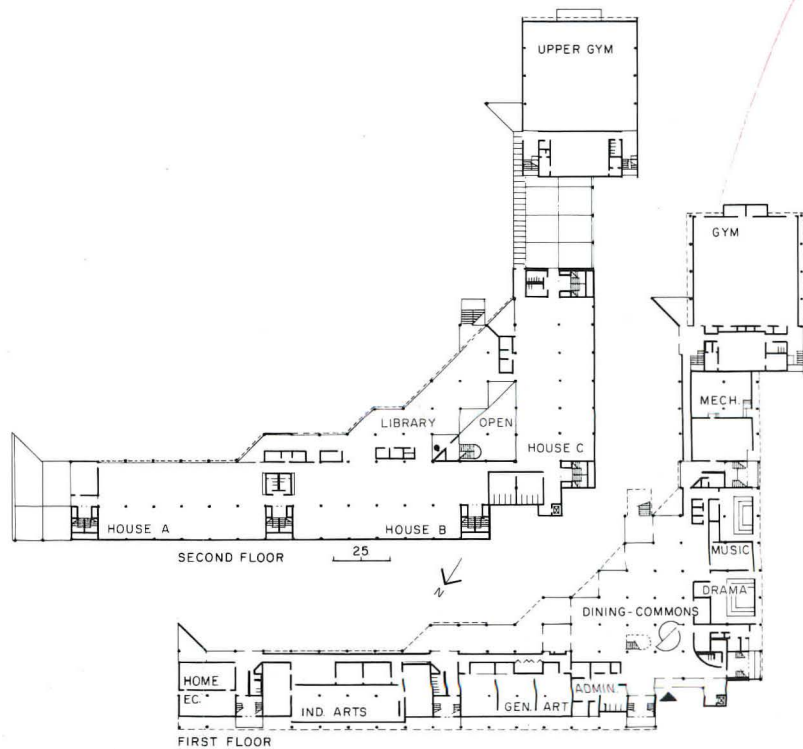
## BARNSTABLE MIDDLE SCHOOL

The Barnstable Middle School is a two-story, L-shaped building in a school "park" which also contains the local high school and shared sports fields. The school is designed for 1200 students, and, like the Cumberland school shown on the previous pages, it is organized according to the "house" system. The houses have 300 students each, and each house has three 100-student open-plan units for sixth, seventh, and eighth grades. The school is

oriented towards a landscaped pond, and this is meant to encourage the extension of eating, teaching, and other student activities to the outdoors as weather permits. The architects tried to avoid an institutional atmosphere by creating a series of small-scale spaces (alternating at important points with large, freer ones) and by softening the visual harshness of the concrete with the kind of wood siding that is familiar on Cape Cod. The

western and northern facades have minimal glass as a conservation measure.

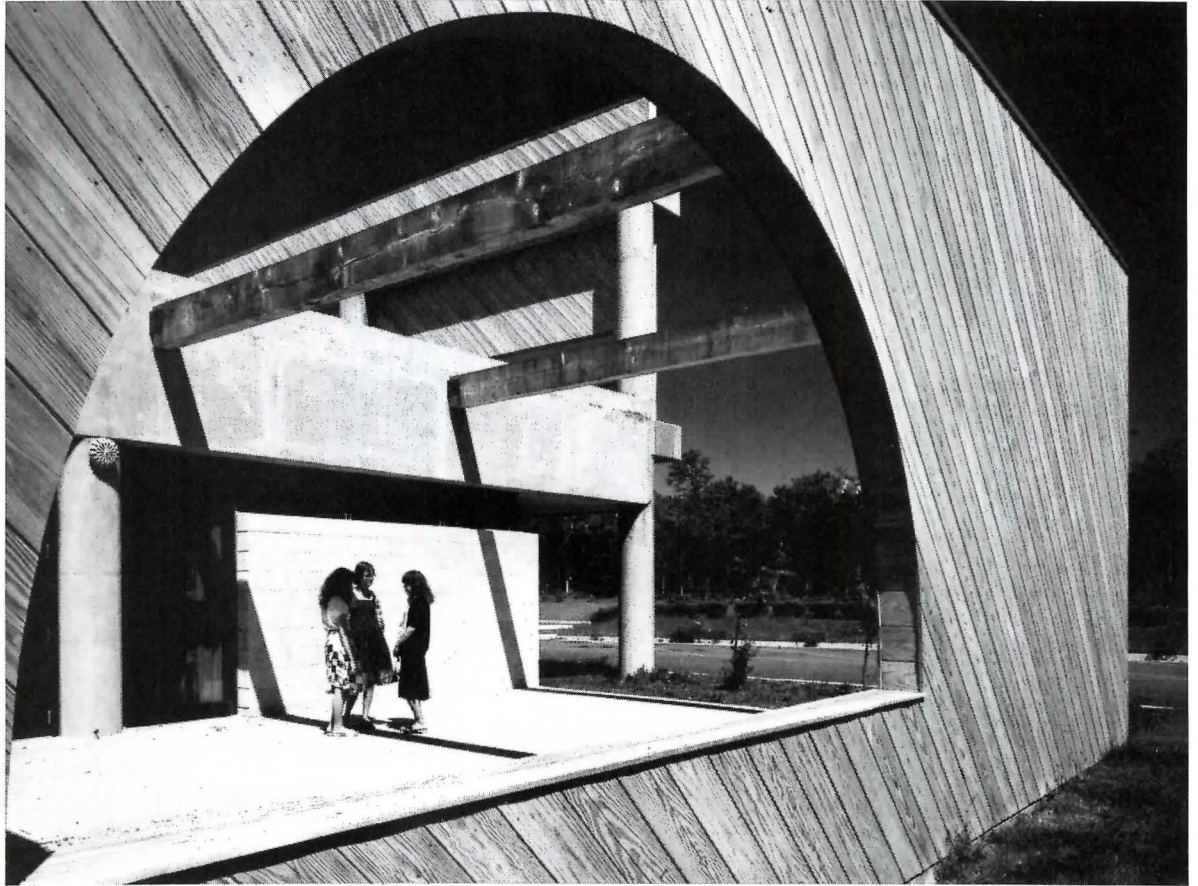
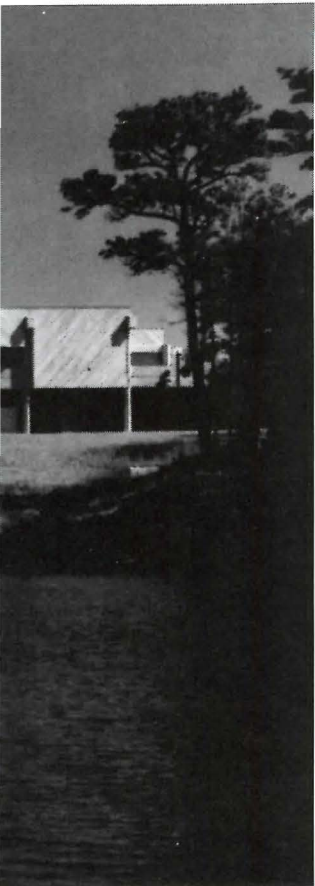
BARNSTABLE MIDDLE SCHOOL, Hyannis, Massachusetts. Architects: *Caudill Rowlett Scott*—*principal in charge: Jack W. Smith; project manager: Charles Baskett; designer: David Kim; design principal: George Hoover*. Engineers: *Caudill Rowlett Scott* (structural, mechanical/electrical). General contractor: *Jefferson Construction Corporation*.



The first floor of the school, which contains instructional facilities used by all four houses, focuses on the intersection of the building's two wings, which is dominated by a double-height student lounge and display area (photo right and below on the opposite page). The dining area is adjacent. The rest of the second floor contains the houses themselves, with their separate student facilities.



*Nick Wheeler photos*



In the first-floor plan, the wing on the left contains administrative offices, guidance services, and offices for the student government, plus health facilities and special classrooms. Functions which usually create the most activity and noise are grouped together in the right-hand wing of the building. These include drama, music, and, at the very end, a gymnasium.



## BLACKSTONE SQUARE COMMUNITY SCHOOL

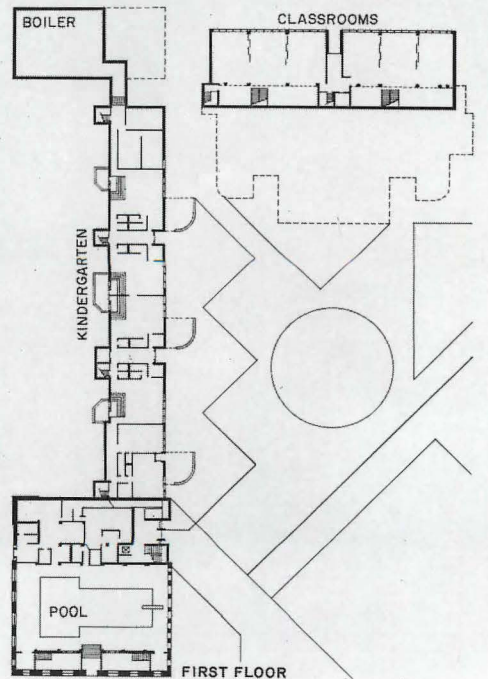
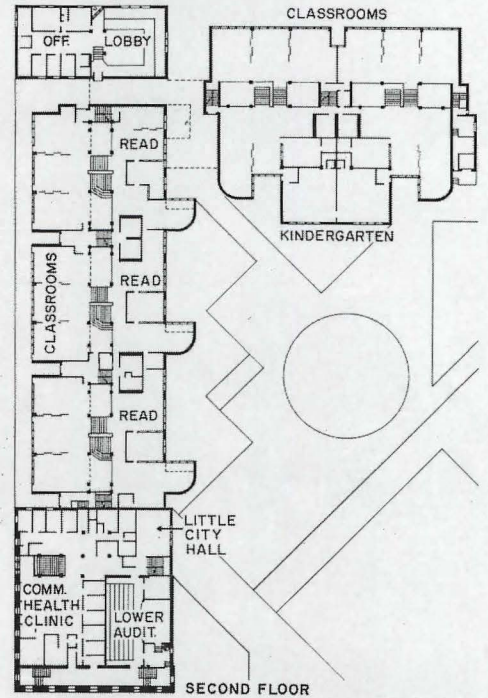
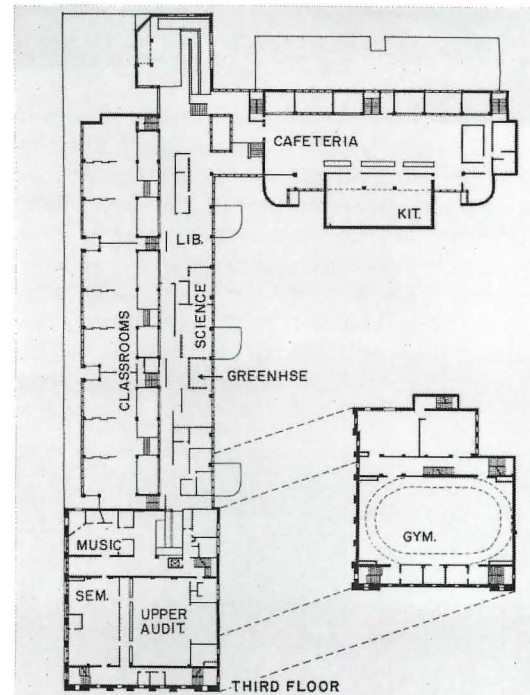
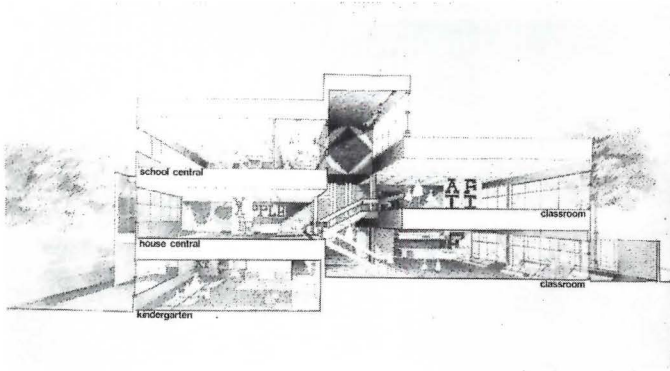
The Blackstone School is designed for a thousand students from kindergarten through the fifth grade, and it is built on a 3.5-acre parcel of urban-renewal land in the South End of Boston. Like the schools seen on the previous pages, it is made up of "houses"—five of them, non-graded, and containing classrooms, a language lab, a science and project area, a small library, and a seminar room. Designed in close collaboration with commu-

nity groups, the building that resulted organizes the five houses vertically like townhouses. Circulation is therefore clear for the child: up and down in his own house, and horizontally through the whole school on a pedestrian street at the upper level, seen in the upper left portion of the section perspective on the opposite page; recreation space is at one end of this spine, and the cafeteria is at the other.

BLACKSTONE SQUARE COMMUNITY SCHOOL, Boston, Massachusetts. Architects: *Stull Associates*—project architect: *John Olson*; designer: *James Velleco*; job captain: *Joe Grazado*. Engineers: *Souza and True* (structural); *Samuel Lesburg Associates* (mechanical); *Goodall Shapiro Associates* (electrical). Consultant: *Land-Tech* (landscape). General contractor: *Solimando Associates*. Client: *Public Facilities Department*—director: *Robert J. Vey*; chief architect: *Stewart Lesser*.



The top plan on the right shows the upper level of the school, with the linear "street" that passes through each of the five houses and also leads to the various common facilities: library, cafeteria, gymnasium, and auditorium among others. Classrooms in each house are organized on the northerly side of the perimeter; more active functions—kindergartens, project areas, central facilities—orient inwards.



Steven Edson photos



## PINE BLUFF SENIOR HIGH SCHOOL

Unlike many schools, this facility's problems were due not to overcrowding but to its fragmented complex of existing school buildings which no longer fit the educational program. Thus the design problem was to remodel and restructure what was already there. Four buildings were demolished altogether, and the remaining three were related to new construction, combined, in other words, into a new and unified campus plan.

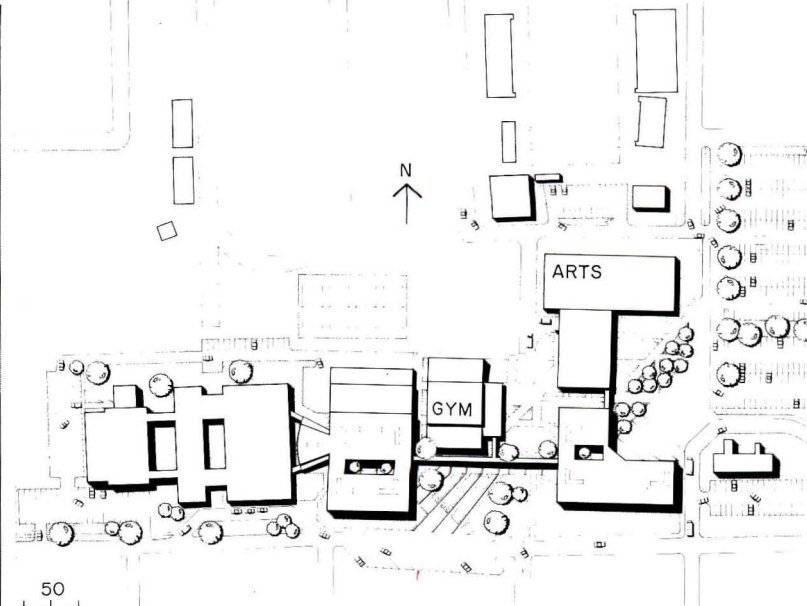
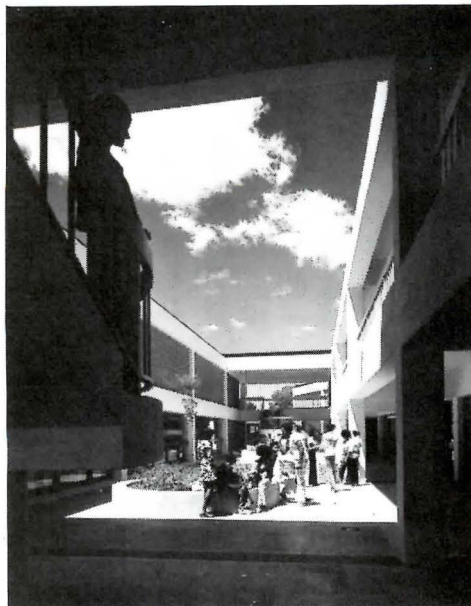
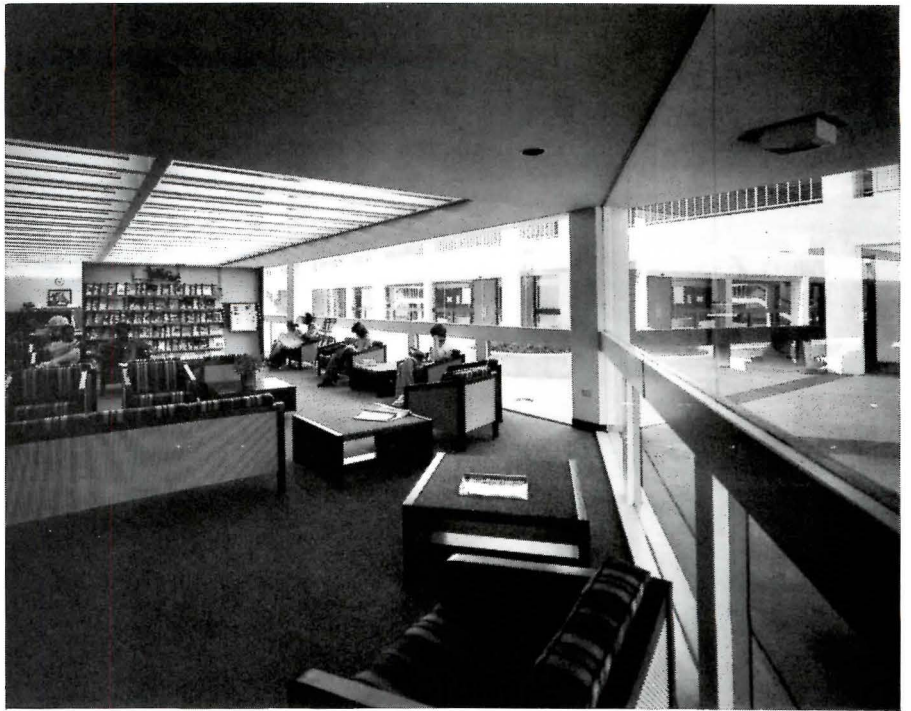
There is now no visible difference between the old and new buildings. The architects, believing that what happened to the spaces outside the buildings was just as important as what happened inside, created major circulation spine linking all of the buildings; it is covered on the lower level and functions almost like a balcony on the level above, and it is interspersed with interior courtyards that create the effect of vest pocket parks, like

those found in many major cities. The result is indeed a remarkably urbane high-school campus, and it is also a remarkable example of the integrated reuse of old buildings.

PINE BLUFF SENIOR HIGH SCHOOL, Pine Bluff, Arkansas. Architects: *Caudill Rowlett Scott*. Associate architects: *Reed, Willis and Burks*. Engineers: *Caudill Rowlett Scott*. General contractor: *Hatcher Construction Company*.



The large photograph below shows a new connecting walkway leading from one newly constructed building to another. On the right is an existing gymnasium which has been renovated. The library and the cafeteria open onto the circulation spine (right and below), and one of the small courtyards that have been created is shown in the small photograph below. The buildings have, on the whole, minimal amounts of glass to reduce vandalism and to conserve energy. But glass is used at the junction between all major building components to express their discreteness and to give a feeling of openness. The fact that all major circulation is outside helps to counter the lack of glass inside.

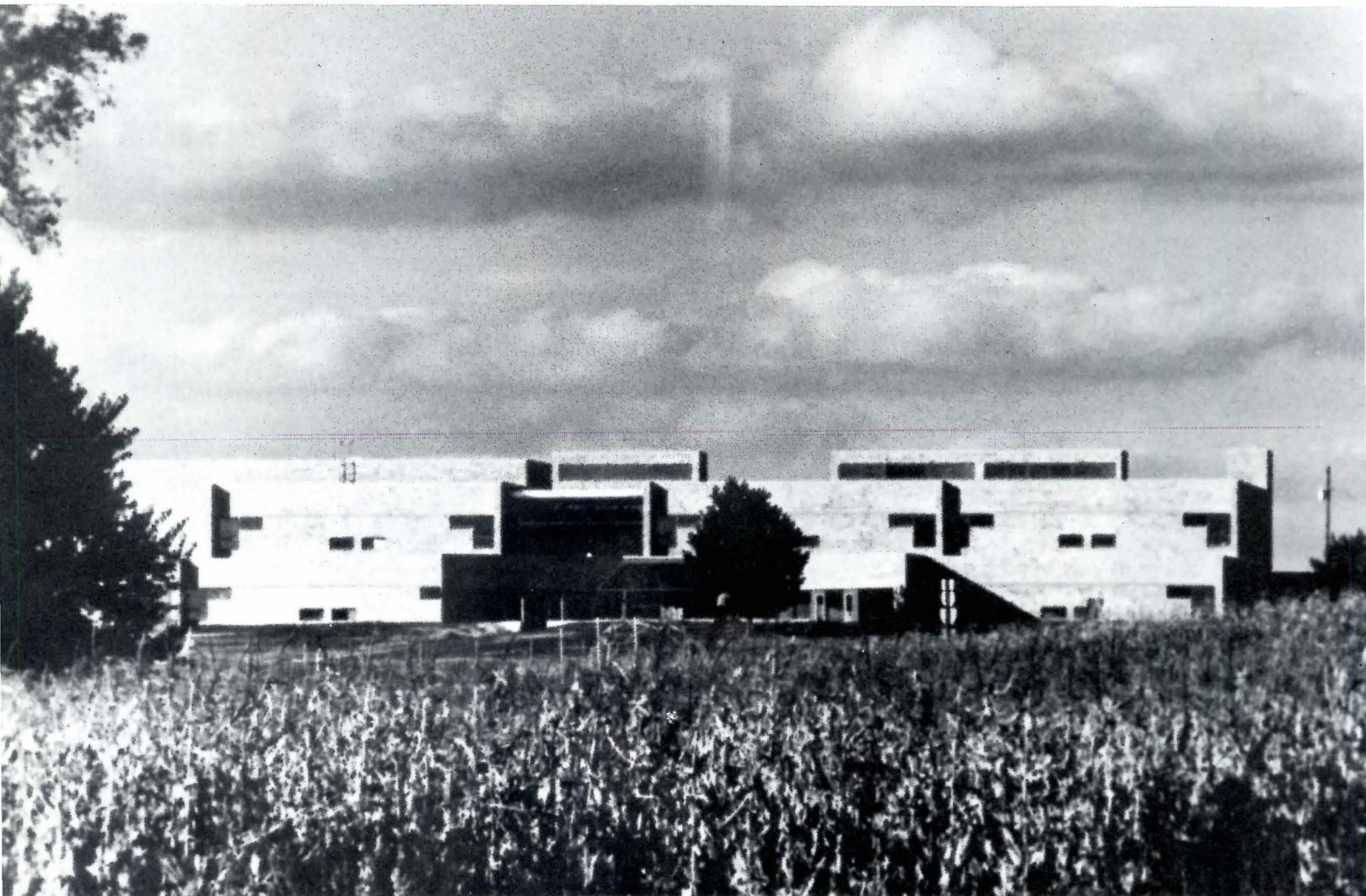


## TRI-CENTER ELEMENTARY SCHOOL

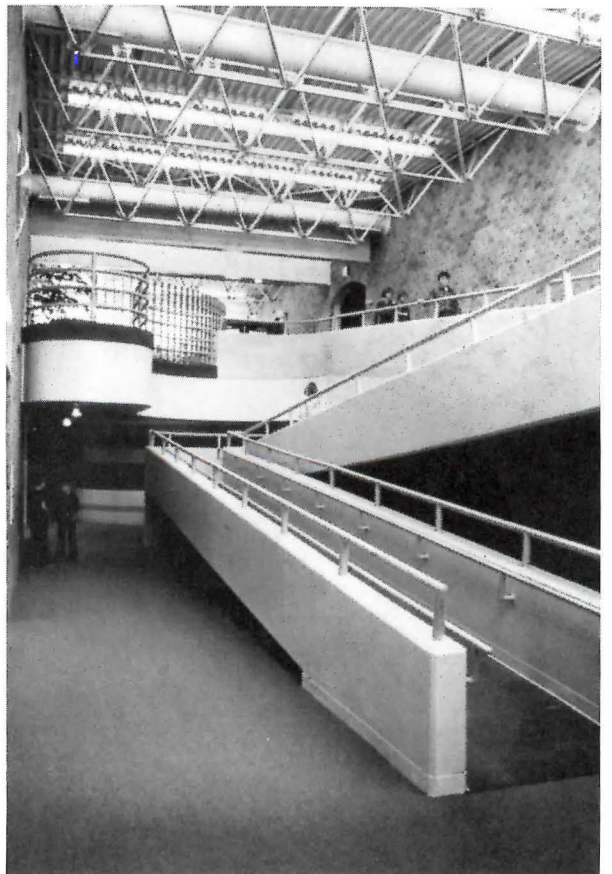
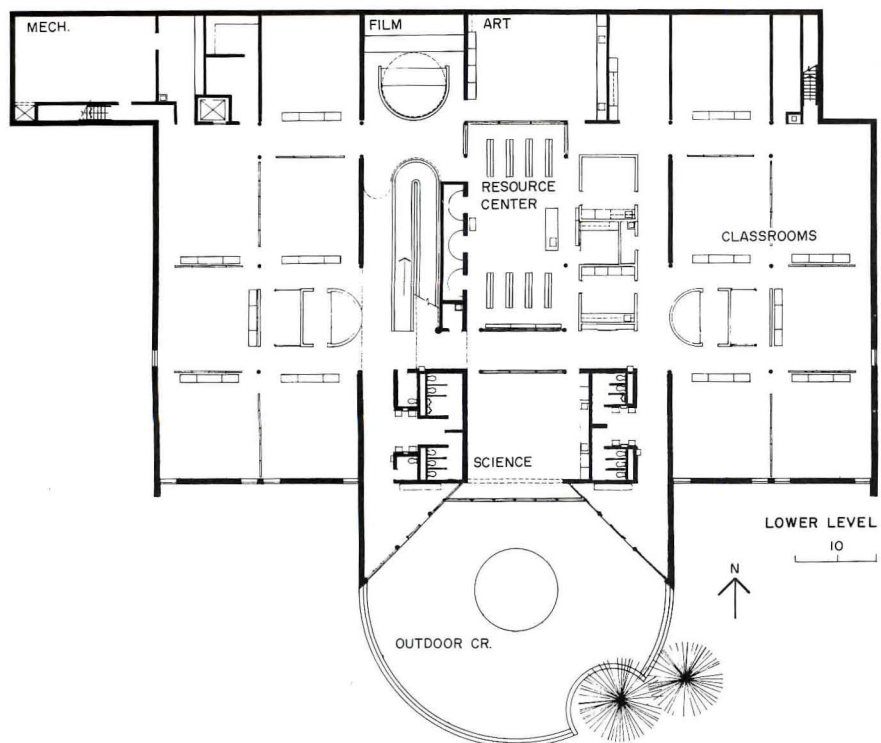
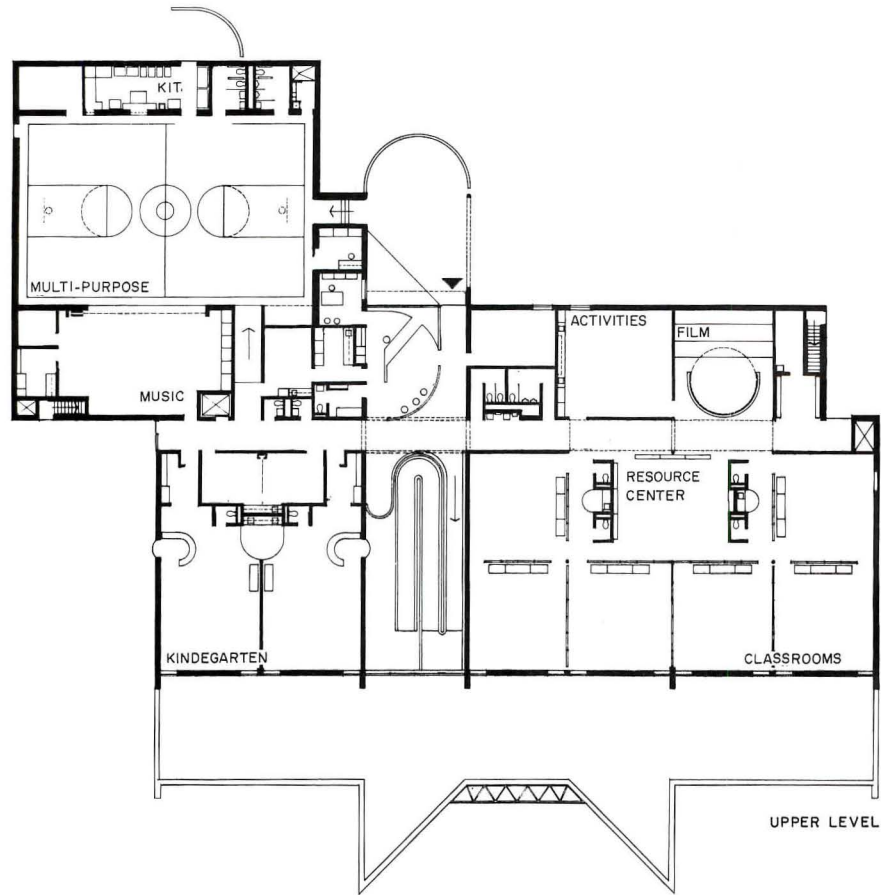
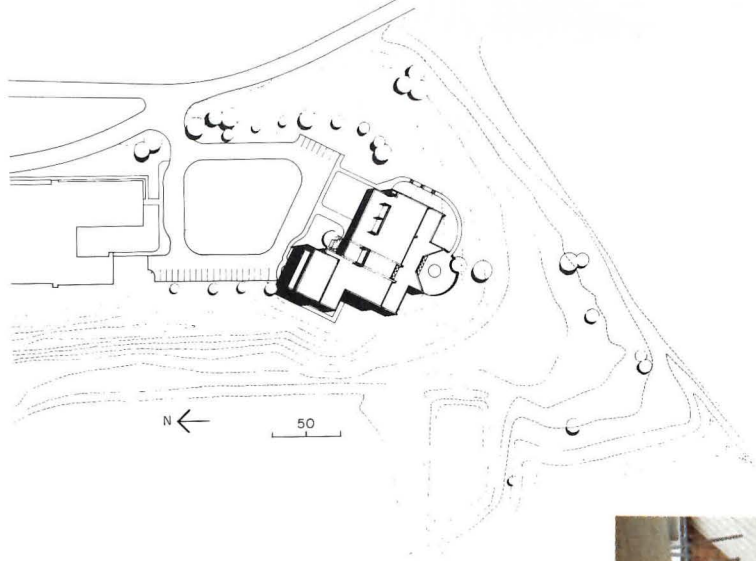
This rural elementary school is located between four communities in a consolidated school district on an eight-acre site that also contains a high school and physical education facilities. The educational program called for traditional individual class group instruction, plus special programs in art and science and physical education. Flexibility, nonetheless, was a key requirement. Thus the building, which is organized on two floors, groups

subdividable class areas around central resource areas. A central ramp space, shown on the opposite page, connects the two levels and also provides a visual and spatial center to the building. The upper floor is designed for use by kindergarten through third grade, and the lower floor is for grades four through six. Each floor contains a stepped-seating viewing room for films and other presentations.

TRI-CENTER ELEMENTARY SCHOOL, Neola, Iowa. Architects and engineers: *Dana Larson Roubal and Associates*—director of design: *Gerold Klein*; director of production: *Wesley Pittack*; project designer: *Bryce Pearsall*; project co-ordinator: *Richard Pawal-ko*; supervision: *Richard Henningsen*; Engineers: *John Trummer and Raymond Hicklin (structural)*; *Tim Elliott and Ralph Nelson (mechanical)*; *James Sanford and Victor Failla (electrical)*; *Dale Nielsen (site)*; General contractor: *Allied Engineering*.



The site plan on the right shows how the site on which the school is built slopes sharply away from the entrance drive. The building is built on two levels and pushed back into the slope, permitting on-grade entry to both levels. Minimal glass and entry areas are on the north exposures, and the south exposure is designed to accept natural light and solar radiation. Since 70 per cent of the lower floor is below grade, heat loss is greatly reduced.



## MAYPORT JUNIOR HIGH SCHOOL

This handsome school stands on a 30-acre site that is screened from surrounding traffic by trees and other foliage. It faces a new lake created by removing fill required for construction and which also provides drainage on the site. The school currently accommodates 1000 students. In form it is a square to which various wings can be added. The square contains core facilities for 1500 students, and so expansion is possible by

adding more wings. Inside, the building groups together a series of classrooms—modified pods with divisible partitions for traditional or “open” use—plus a host of other educational facilities around an airy central commons space (opposite page). Exposed catwalks, air ducts, and water pipes are painted red, yellow, and blue to enhance the sense of liveliness of the interior and to contrast with its otherwise pure white

surfaces. Light enters from above through eight monitors that are also designed eventually to receive solar collectors.

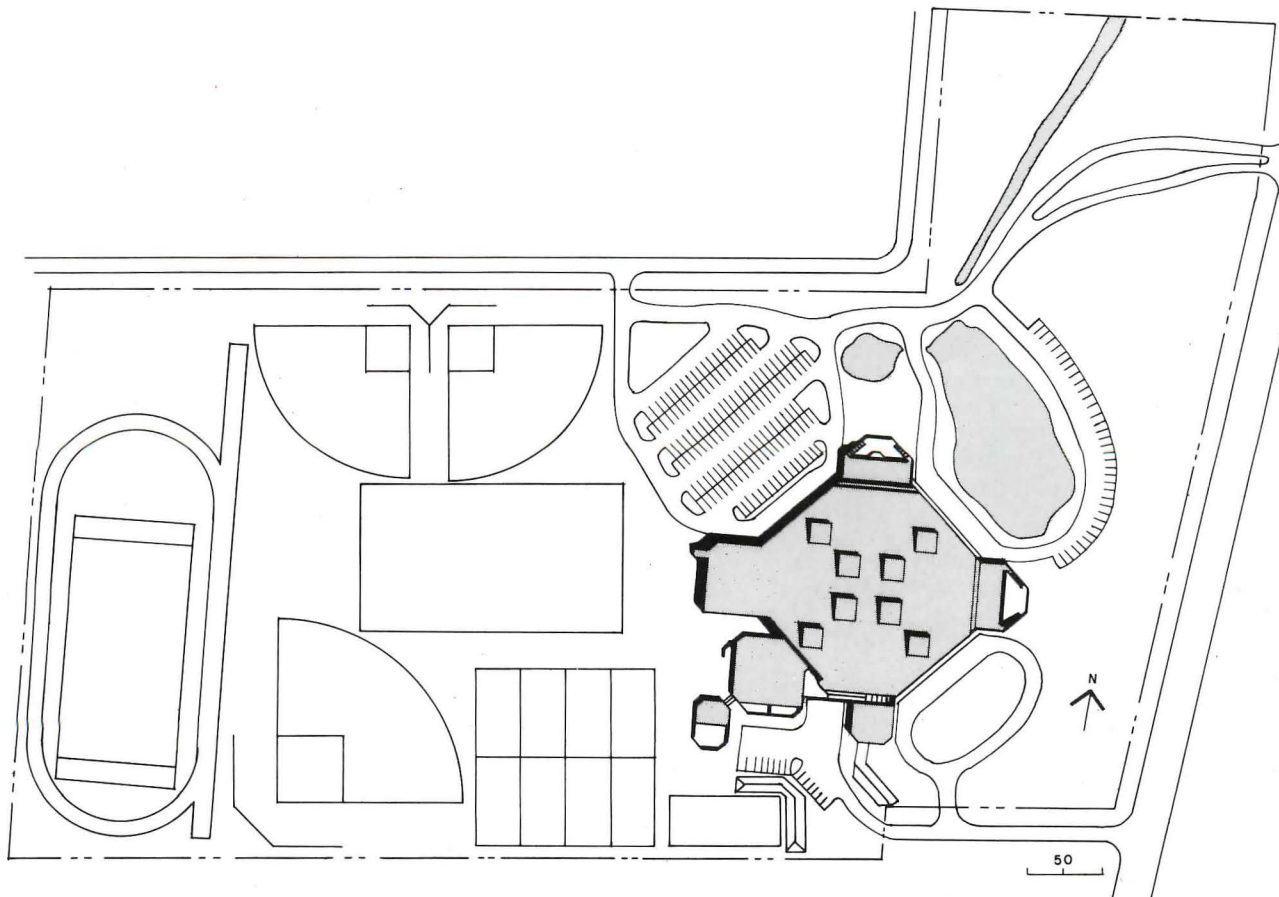
MAYPORT JUNIOR HIGH SCHOOL, Atlantic Beach, Florida. Architects: *Freedman, Clements and Rumble*—project manager: *Harley Parkes*. Engineers: *Haley Keister & Associates* (structural); *Wilder & Associates* (mechanical). General contractor: *R. B. Gray Construction Co.*



The site plan below shows how the school is basically square in shape, with a number of wings appended almost randomly. The eight north-facing monitors admit shadowless daylight into the interior, and their opaque south-facing sides are properly pitched eventually to become the mounts for solar collectors. The photograph below right shows the central commons area with its brightly colored details. Although it is designed for community use, the building has a pneumatic, burglar-proof entry control system which maintains security in the rest of the building when only one part of it is being used at night. Windows to the outside of the school are made of unbreakable poly-carbonate.

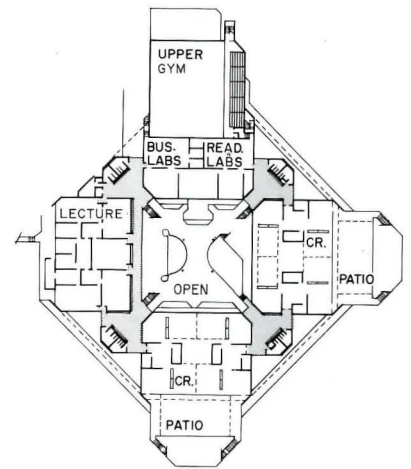


Bob Braun photos

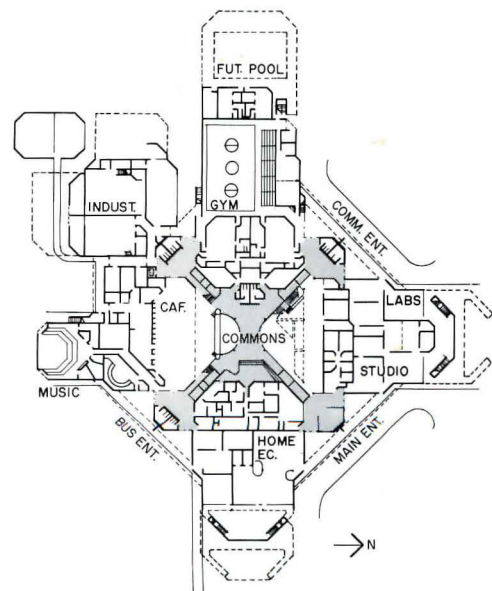


The photograph on the left shows the band rehearsal room, located far from the central commons in an almost separate wing. The lower photograph shows the stage, a half-circular space that opens both into the cafeteria—thus rendering it a “cafetorium”—and into the commons area, from which it is seen in the photograph. It can be opened and closed on both sides in a variety of ways to create a separate cafeteria, a traditional auditorium, a little theater, and a theater-in-the-round. The plans below show how the school building is composed of a basic square with the commons area, two stories high, in the center, and with a series of particular wings for particular functions added on where required.

Bob Braun photos



SECOND FLOOR



FIRST FLOOR

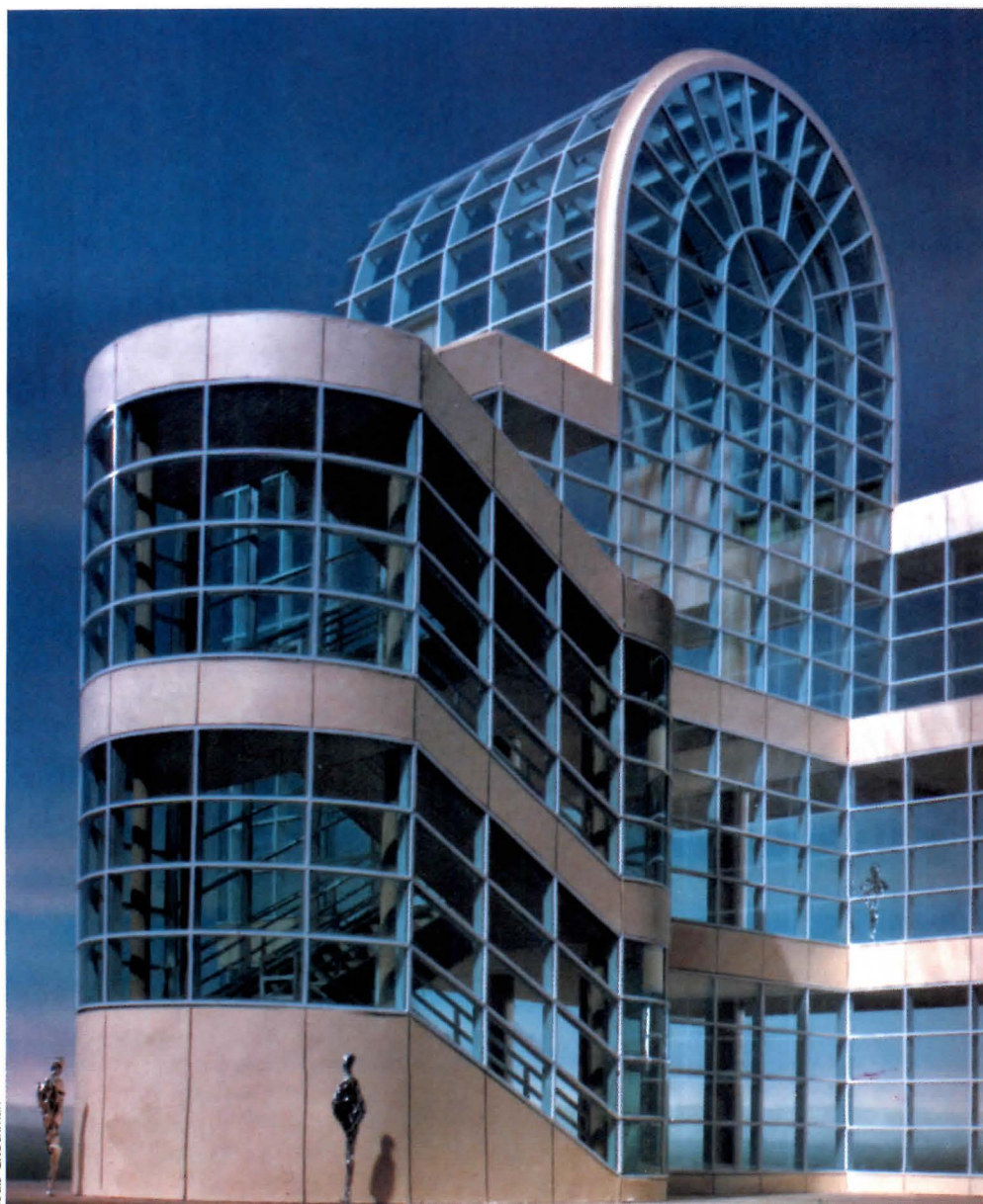
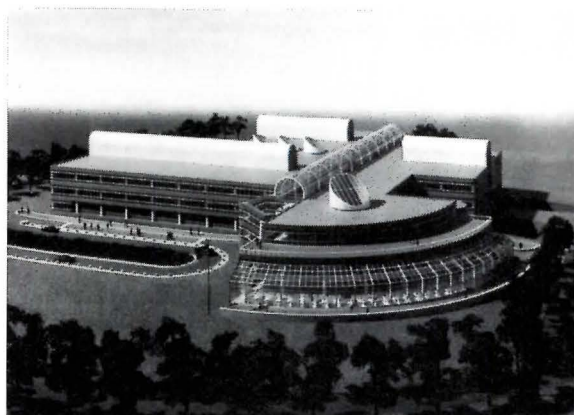
## Skylights: better technical performance for an architectural favorite

The old saw had it that, "skylights always leak." But today's plastic domes and sloped glazing—the technical appellation for glazing that slopes more than 15 degrees from the vertical—are high-performance systems with proven techniques for keeping the water out. While water integrity cannot be taken for granted, the major concerns today are: 1) energy efficiency, and 2) safety of glazing materials, particularly with respect to potential breakage over areas occupied by people.

The major skylight manufacturers have confidence in standard details they know will

work and that still allow a wide range of customization in sloped glazing designs. Certain basic design criteria do have to be observed: First, the glazing needs to be sloped for the drainage of rain and condensate and to aid self-cleaning. Secondly, the gutter system under the glazing that catches condensate and serves as a second line of defense against leakage has to be designed and installed, and have sufficient capacity, so that the gutters drain to the exterior.

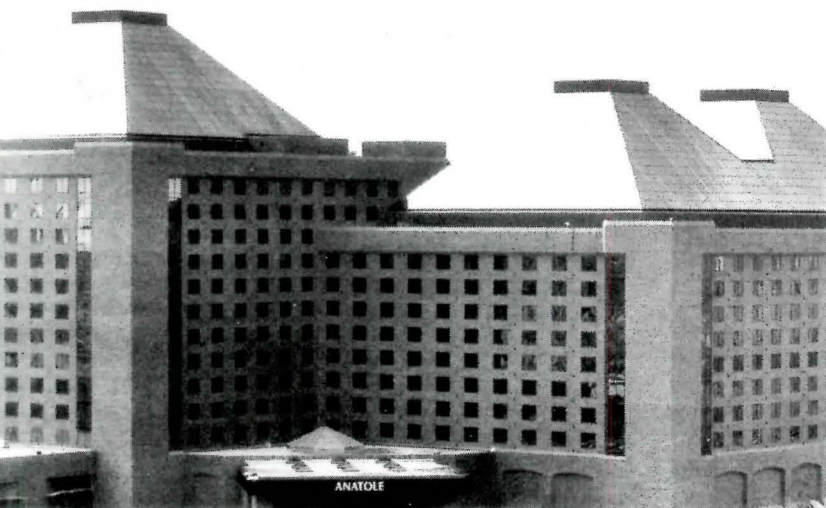
Architects should contact manufacturers and/or consultants as early as possible to establish major design parameters. In addition



*A long gallery gives relief to large open-plan areas and provides an interior street in AT&T's 400,000-sq-ft Long Lines Eastern Area Headquarters, Oakton, Virginia, designed by Kohn Pedersen Fox Associates, Architects. To meet energy-code requirements, reflective insulating glass was used throughout, and a large portion of the curvilinear cafeteria enclosure has opaque insulated panels. Insulating glass is heat-strengthened, and the inboard light is laminated. Skylight fabricator: Super Sky Products.*







©Steve Rosenthal

Skylights over the 200-ft-high atriums of Loews Anatole Hotel in Dallas provide daylight while also reducing air-conditioning costs. Reason is the use of 60,000 sq ft of laminated, heat-strengthened reflective glass. Architects: Beran & Shelmire. Skylight fabricator: Fisher Skylights, Inc.

A 420-ft long glass canopy shelters customers patronizing Boston's Quincy Market designed by Benjamin Thompson and Associates, Inc. Protection from weather and sun is provided by a rolling glass door and awnings. To account for heavier snow loads below the roof of the old market, the 3/16-in. heat-soaked tempered glass lights are smaller near the top. Skylight fabricator: EPI Architectural Systems, Inc.

to water integrity these, among others, include: how the skylight loads the building by its own weight, snow and wind, how large the lights of glass can be for the available structural capacity of the glass, and selection of glass with respect to solar loading (heat gain, stress buildup, etc.).

If the same skylight design that has proved its water integrity is repeated then in all likelihood it should work satisfactorily. But, in a somewhat hyperbolic statement, consultant Gordon H. Smith says that, "The only thing that's standard is a plastic dome. You can't say a 'skylight' is a 'skylight,'" Smith continues, "because there are little changes each time. Standard extrusions may be used but in a unique skylight configuration. And even though the configuration may not be unusual, there are always some changes each time. It's like someone buying a Cadillac and saying, 'But I want the fins a little different; the headlights a little different. Two little

fishtails are not going to change anything.' But in a skylight, they are," says Smith. With major skylight installations, consultants\* will recommend, and architects will want, mock-ups tested for leakage. If the mockup leaks, it has to be carefully analyzed to determine why. Gordon Smith cites an example: A particular design might have neoprene gasketing with caulking over the gaskets. If water comes through during mock-up testing, two questions arise: 1) why did the outside seal fail in the first place, and 2) why was the water not channeled through the drainage system—was there an overflow in the gutter system (gutters not deep enough) or were the intersections of the gutters not sealed or incorrectly sealed?

\*Nationally recognized independent consultants include L. Russell Buczkowski of Peter Corsell Associates, Jack Heitmann of Antoine Associates, Gordon H. Smith, and Eugene Tofflemire.

### Energy conservation has become important for both plastic domes and custom designs

Not since the 1950's has there been as much interest as there is now in the application of daylighting to provide illumination for seeing tasks. For one thing, the dome skylight industry, concerned about the potentially negative impact of energy codes on the use of skylights, has developed, through AAMA (Architectural Aluminum Manufacturers Association) a voluntary standard for calculating, via computer, skylight annual energy balance—heat gains and losses versus "free" daylight and savings in electric lighting energy. The procedure has been put into the computer by one of the member companies, Rohm and Haas, which has called the program SUN for Sun Utilization Network. The program is suitable for domed skylights used in symmetrical configurations, in a manner similar to electric lighting fixtures.

Because of the high intensity of light



The translucent "skyroof" over this fast-food restaurant in Portland, Oregon is the first application of a translucent roof covering that has a Class "A" U.L. listing (for severe fire exposures). It comprises fiberglass-reinforced plastic skins bonded to an aluminum grid by Kalwall Corporation. Architects: Boutwell, Gordon, Beard & Grimes.



Sloped glazing for passive solar in this housing at White Mountain School in New Hampshire has clear panels for a view of the sky in the midst of a large area of panels comprising acrylic double-skinned sheet made by Cy/Ro Industries (winter U value is 0.58). Architects: Banwell, White and Arnold.



Run Identification	Number of Skylights	Lighting Credited at (Foot-candles)	Size	Roof Coverage (Per Cent)	Total Annual Building Savings (thousands of Btu's) Non-air-conditioned Buildings	
					Lighting Credit At Design Level Only	For All Light
Case I	49	4	40 x 40	.37	34,918	61,867
II	90	8	40 x 40	.67	66,849	113,515
III	90	20	49 x 72	1.58	246,482	423,694
IV	90	20	57 x 69	2.13	312,141	586,936
V	90	20	45 x 93	2.27	322,032	624,769

The runs are based on single-dome units with 9-in. curbs insulated to a U value of .21 and a 5-in. deep well of 80% reflectance.

The owners of a 127,000-sq-ft warehouse near Dallas, Texas, Dal-Mac Construction Company, expect a payback of 5 years for the installation of plastic-dome skylights to provide an average of 20 footcandles of daylight illumination during a large portion of the daylight hours between March and October. Strip fluorescents are used

the rest of the time. Five roof coverages were examined for the architect, Richard Ferrara by Naturalite Inc., the skylight manufacturer, utilizing the SUN computer program developed by Rohm and Haas. The skylights are single-dome acrylic plastic with solar and visible transmittance of 36 per cent.

from the sky, the percentage of roof coverage with skylights is surprisingly low. Furthermore, this percentage needs to be optimized with respect to heat losses and gains in various climatic regions of the country. In cold areas, of course, solar gains in winter counteract conductive heat losses. In the winter, heat from electric light may not be available, but by the same token it may not be a heat gain factor in the summer. Information from Wasco Products, Inc. shows that for a building in Chicago, 50 per cent of the annual 8 a.m. to 5 p.m. hours can be daylighted to 60 footcandles with between 4.8 and 6.9 per cent roof coverage with domed skylights, depending upon the transmittance of the skylight. In order to spread the light in normal ceiling-height rooms, dome skylights need to employ a white translucent type of plastic. As the transmittance of the plastic increases the dome skylights can be spaced farther apart from the standpoint of evenness of illumina-

tion, but the amount of light, of course, will be less. Clear domes need to be spaced much closer together; for evenness of illumination, their maximum spacing should be only one-half times the ceiling height. Furthermore, clear, tinted plastic domes transmit and reradiate more total solar heat than white domes, and can create uncomfortable "hot" spots in occupied areas. So clear domes should only be used in high-ceilinged rooms, unless they are for esthetic effect.

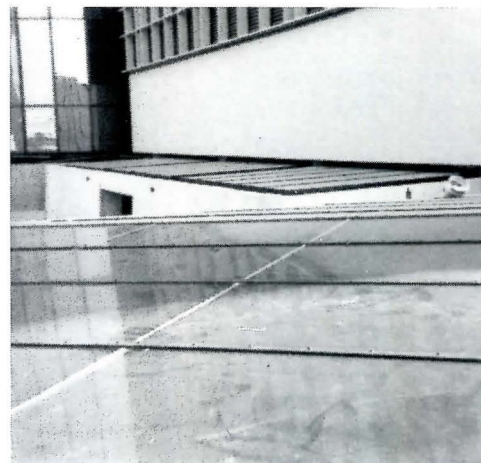
When ASHRAE Standard 90-75 was introduced, the dome skylight industry feared that the roof U-value restrictions would detrimentally affect the application of skylights, and, furthermore, would restrict the utilization of a renewable energy resource—the sun. Since that time some of the model codes have recognized the energy benefits of skylights. For example, the Southern Building Code allows up to 10 per cent of the roof to be skylights provided that the skylights have

double domes where the annual degree days exceed 2500, the curb U values do not exceed 0.21, and the exfiltration does not exceed 0.05 Btu per ft of periphery. In the BOCA Code skylights can be substituted for windows, and solar-energy benefits are recognized if the building is being designed according to a budget energy approach, permitted by code, rather than a prescriptive component approach.

The determination of lighting-energy benefits and beneficial or deleterious heat gains and losses is much more complicated for buildings with large-area skylights and complicated interior layouts. It has been reported that at a recent meeting of the Illuminating Engineering Society Committee on Daylighting, members agreed that for such buildings the architect's best approach to designing for daylight is through the use of scale models which can be examined not only with respect to quantity of illumination, but



*Overhead glazing must be sloped for drainage of rainwater and condensate, and to promote a certain amount of self-cleaning. But the architects for Renaissance Center in Detroit, John Portman & Associates, wanted to create an element of surprise with daylight, and called for a nearly-flat slope so that the skylights would not be apparent from outside. Since slope is  $2\frac{1}{2}$ - $3\frac{1}{2}$  degrees, the  $\frac{3}{8}$ -in. laminated glass had to be butt-joined in the direction of the slope and sealed with silicone to avoid barriers that would dam the water. The skylight fabricator, Roper IBC, became involved in many preliminary tests before the system was finally approved.*



also from the standpoints of quality and esthetics by observation and photography. Unfortunately, there is now little, if any, literature on how model studies should be conducted, so the architect is pretty much left to his own ingenuity. Furthermore, at the present time there are no recognized methods for accurately determining energy balances for the more complicated skylighting situations.

But even where daylighting is not being taken advantage of in terms of calculated energy-saving benefits—as is done with uniformly spaced plastic-dome skylights—the architect may have to select skylight glazing materials with low U values in order to conform with prescriptive component-type energy codes.

For example, in the AT&T Long Lines Eastern Headquarters shown on the first page, high performance glass was required for the galleria skylight and opaque panels

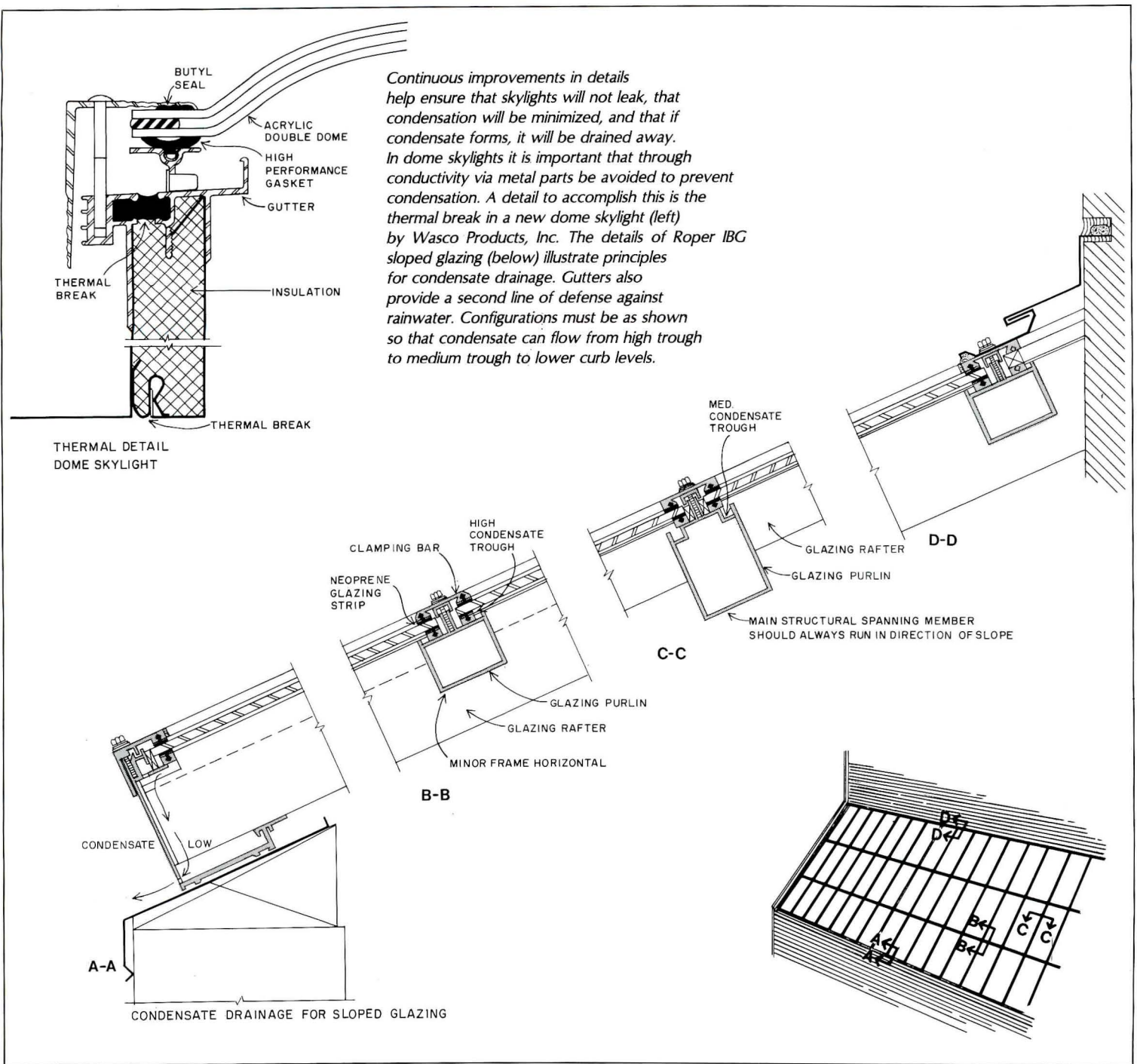
were required in the sloped glazing section of the cafeteria in order for the building to meet the envelope U-value stipulations of the BOCA energy code (based upon ASHRAE Standard 90-75R). The insulated glass with reflective coating has a winter U value of 0.29. Combined with an insulated roof that has a U value of 0.05, the over-all U value is under the required 0.08 for Fairfax County, Virginia. The glass comprises an outer light of  $\frac{1}{4}$ -in. blue-green heat-strengthened glass with gold reflective coating on the inner face, and an inner light of two pieces of  $\frac{1}{8}$ -in. heat-strengthened glass laminated to a 0.060-in. polyvinyl butyral interlayer.

The building, which has 1.7 W/sq ft of lighting, is estimated by the consulting mechanical engineers, Cosentini Associates, to have a building energy budget of 70,000 Btu per sq ft per year, based upon a building area of 417,000 sq ft. Four 20,000-gal. water tanks are provided for thermal storage.

#### **With uses of sloped glazing growing rapidly, safety is getting more attention**

Most building codes still require that skylight systems use wire glass, or if ordinary glass is used, that the skylight be protected by means of a wire mesh screen. Approved plastics are allowed, but with area and location restrictions. More sophisticated glasses are being specified by architects in sloped glazing systems these days, however, because wire glass is not a very durable material (wires can rust), because it is less strong, and because it is not obtainable with solar control characteristics. The materials being used today are heat-strengthened laminated glass and tempered glass, and variances are given by code authorities for the application of these stronger glasses (for the same thickness, a single layer of heat-strengthened glass is two times as strong as annealed glass, and tempered glass is four times as strong).

At present, different glass companies



Continuous improvements in details help ensure that skylights will not leak, that condensation will be minimized, and that if condensate forms, it will be drained away. In dome skylights it is important that through conductivity via metal parts be avoided to prevent condensation. A detail to accomplish this is the thermal break in a new dome skylight (left) by Wasco Products, Inc. The details of Roper IBC sloped glazing (below) illustrate principles for condensate drainage. Gutters also provide a second line of defense against rainwater. Configurations must be as shown so that condensate can flow from high trough to medium trough to lower curb levels.

advocate different materials for sloped glazing over occupied spaces—and these advocacies arise from a variety of factors that include technical viewpoints, marketing philosophies, material selling prices, and production capabilities. For example, for single lights in sloped glazing, PPG Industries advocates two thicknesses of heat-strengthened glass laminated to a vinyl interlayer. Libbey-Owens-Ford, on the other hand, advocates fully-tempered glass. For insulating glass units, PPG recommends heat-strengthened laminated glass for the lower light and a heat-strengthened single sheet for the upper light. LOF recommends tempered glass for both lights of insulating glass units.

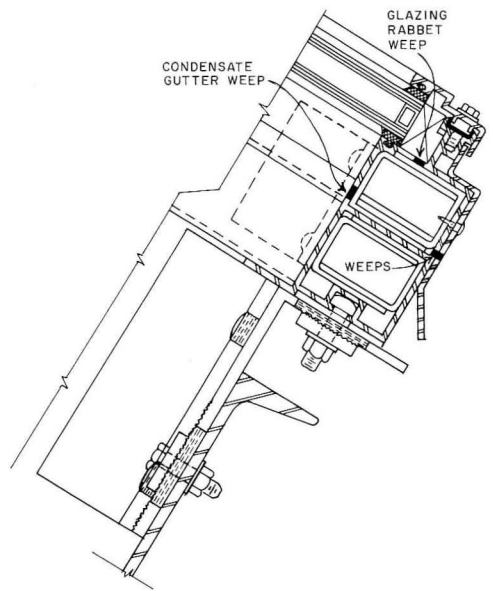
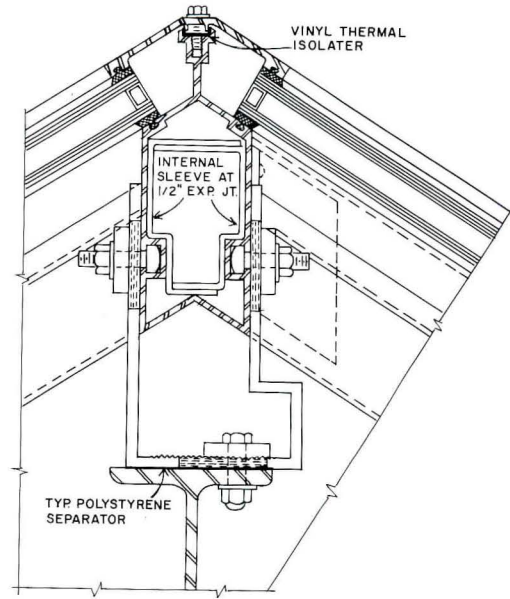
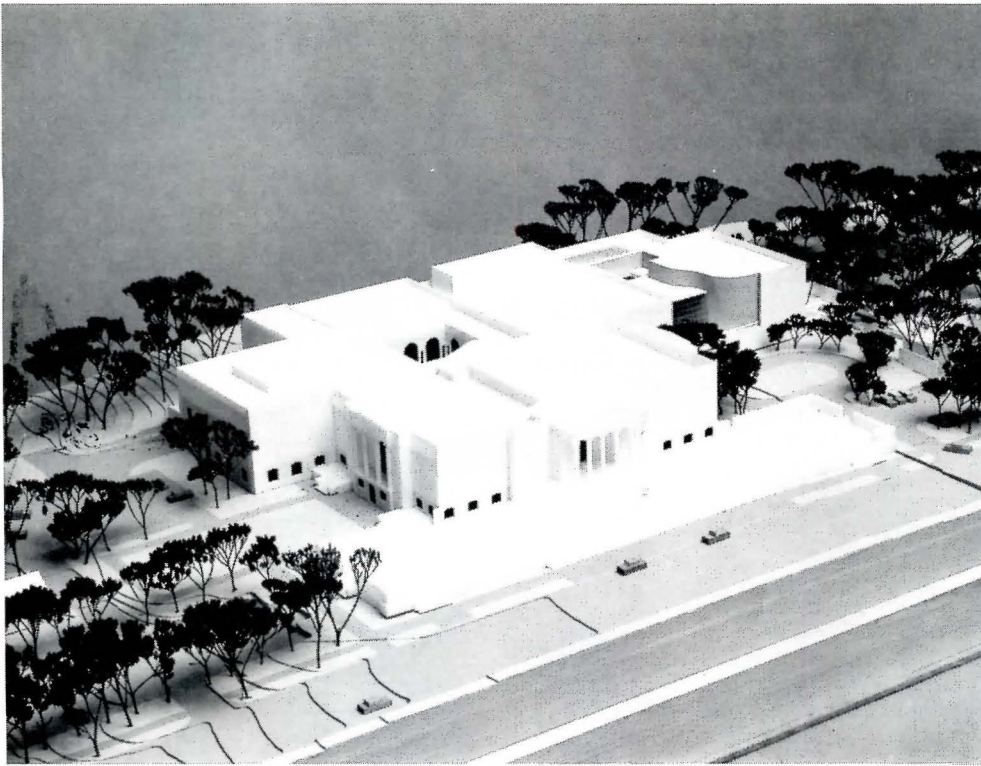
Because there is no industry standard now with respect to safety glazing materials for overhead glazing, a sloped-glazing committee was established recently within the Architectural Aluminum Manufacturers Association with the purpose of developing a

voluntary standard that could be available in a year to 16 months from now.

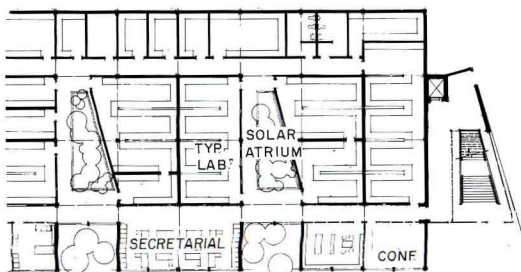
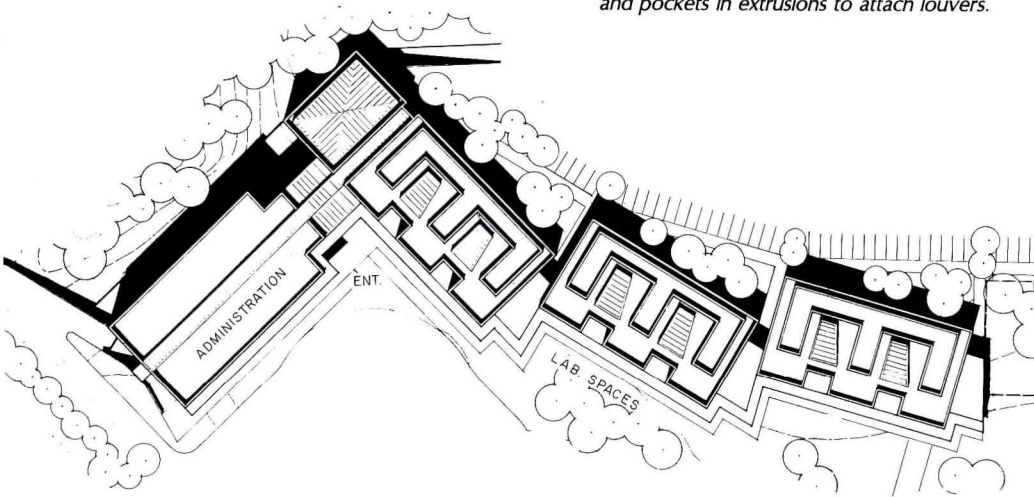
As in most matters of safety, there are no simple answers, but the arguments pro and con are as follows: The laminated glass proponents state that only wire glass and laminated glass stay held together when broken. Tempered glass, the strongest of all, fractures into small crystals when broken rather than shards, as will occur when annealed plate glass is broken. There is no assurance, however, skylight fabricators say, that, when broken, a tempered light will come out all in tiny fragments; there is the chance that the crystals may hang together and fall out as a larger piece. On the other hand it is conceivable, some say, that hit hard enough, and depending upon support conditions, a whole light of laminated glass could be knocked out. Because of material and manufacturing costs, laminated glass is substantially more expensive.

Because of its inherent nature, tempered glass can break spontaneously. Glass contains an impurity called nickel sulfide "stones" that are tiny and cannot be seen or eliminated from the glass. The cooling process used to temper glass causes internal stresses to be built up around the "stones." Expansion of the nickel sulfide "stones" that might occur because of solar heat could cause tension stresses and break the glass. For quality control LOF and Pilkington artificially stress their tempered glass in a process known as "heat soaking" to purposely break glass that has a weakness because of nickel sulfide.

One example cited by a skylight manufacturer in the use of plastic for safety glazing is an outdoor canopy that had been glazed with wire glass. Perimeter guards had been removed from an adjacent roof, and ice slides were breaking the glass. As a remedial step, the wire glass was entirely replaced with polycarbonate plastic.



*In their remodeling of the Baltimore Museum of Art, architects Bower and Fradley are replacing the existing skylights with a new system that will control both the ultraviolet light and the amount of daylight. About one-half of the skylight will be heat-strengthened or tempered insulating glass and the rest will be insulated panels. An adjustable grille will be provided to modulate the daylight. Below the pitched skylight will be a horizontal layer of acrylic plastic with UV filtration to diffuse the light. Some of the features of the skylight-system structure designed by Peter Corsell Associates, include slots for bolt heads for ease of field assembly, neoprene isolators to reduce heat transfer in winter and prevent condensation, a condensate gutter weep system, and pockets in extrusions to attach louvers.*



*Trapezoidal skylights above the laboratory wings and a linear barrel skylight over the administration building have been planned by The VVCR Partnership for the Maryland Department of Agriculture Headquarters Building to save enough lighting energy to pay back the skylights in 6 to 8 years. Two models were built and footcandle readings taken by architect Bruce Rich of the firm to get some idea of what lighting levels might be throughout the year at different locations in the building. Walls of the laboratories around atriums have glass to admit daylight.*



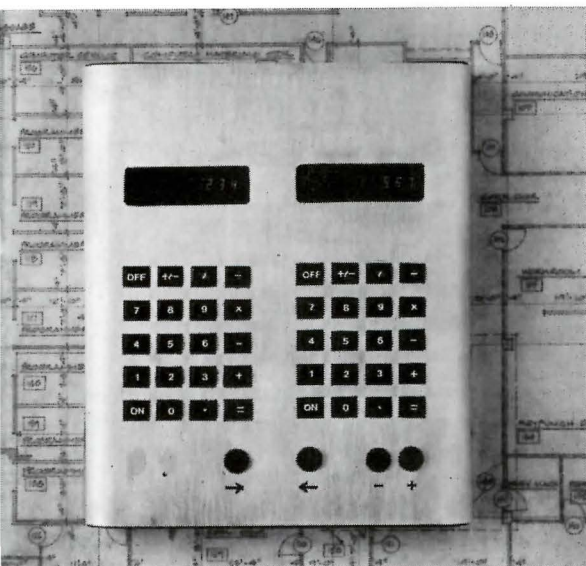
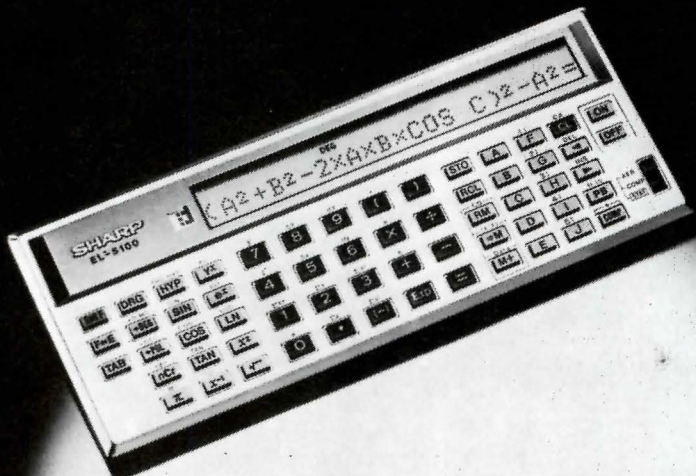
For more information, circle item numbers on Reader Service Inquiry Card, pages 227-228

## Mathematic formulas usable in calculator

The most complicated formulas for any kind of mathematical or scientific work can be entered into this machine as written, without being translated into machine language. A full display of the formula reads at top, and can be edited, corrected or tested without going through any translation phase. The model shown is EL-5100 capable of a 24-character display which can enter and store up to 80 steps. It has 61 keyed functions, ten

data memories and a Memory Safe Guard to maintain data and programs even when the power is shut off. The key to this calculator is a rolling writer dot matrix liquid crystal display which shows numbers, letters and symbols. It is wafer-thin, horizontally-designed and weighs approximately five ounces, and comes in a brushed metal finish. ■ Sharp Electronics Corp., Paramus, New Jersey.

circle 300 on inquiry card



## Dual keyboard versatility in calculator designed for architects

A hand-held calculator designed especially for architectural work has been introduced by Architronics. Its special feature is two keyboards that allow feet, inches and fractions of inches to be added or subtracted with a minimum number of keystrokes and without conversions, as well as performing standard functions including per cent calculations. A compact unit, it measures 6½-in. by 7¾-in. by 1¼-in., and comes in a case of brushed aluminum and acrylic plastic. ■ Architronics, New York City.

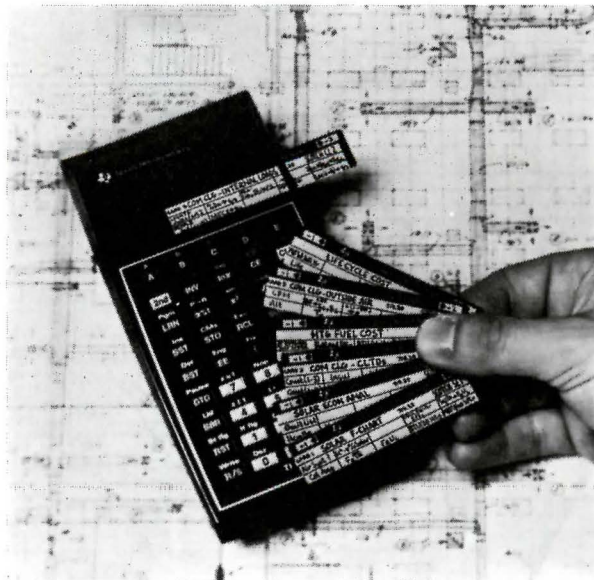
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## Calculations aided by magnetic card program

A new magnetic card program has been devised to be used to aid engineering calculations. As part of Scot-Ware programs, this new program can be used by air conditioning, solar, energy management and electrical engineering fields. As an "electrical fault current calculation program," it calculates 3-phase symmetrical

bolted fault currents and equivalent bus impedances, as well as bus voltages and branch currents, for complex reactive and resistive circuits. It is to be used only with designated Texas Instrument calculators and other specified microcomputers. ■ Scotch Programs, Inc., Miami.

circle 301 on inquiry card



## Low-cost calculator designed for business functions

A special function calculator has been developed especially for the business person who needs to figure payments of any kind. The "Loan Arranger II" is intended to replace charts, factors and amortization books, and to cut the amount of search time. ■ Calculated Industries, Inc., Newport Beach, Calif.

circle 303 on inquiry card  
more products on page 157

For more information, circle item numbers on Reader Service Inquiry Card, pages 227-228

**CONSTRUCTION PRODUCTS** / Data sheets describe the *Veeline* fascia panel, made of aluminum with a board-and-batten appearance, and the *Econosnap* roof edge. Drawings illustrate installation details for both products. ■ W.P. Hickman Co., Asheville, N.C.

circle 400 on inquiry card

**INTERIOR LIGHTING** / A 24-page catalog describes a complete line of lighting/ceiling systems incorporating *Holophane* luminaires, modular suspension systems, air distribution equipment, and acoustical materials. Color photos show many actual installations; detail drawings illustrate ceiling components and design configurations. Acoustical and technical properties are included. ■ Johns-Manville, Denver.

circle 401 on inquiry card

**PAINT SELECTION GUIDE** / Published by the Wisconsin Painting and Decorating Contractors Association and based on research by architectural students at the University of Wisconsin-Milwaukee, the "Guide to Choosing Paint for Interior Surfaces" is intended primarily for architects, contractors and maintenance engineers. In wall chart form, the Guide lists ten different interior space designations—offices, lavatories, food preparation, workshops, etc.—classifying them according to their levels of exposure to water, chemicals, impact, mechanical and food. The correct application of the six generic binders (alkyd, vinyl, epoxy, latex, polyurethane and chlorinated rubber) is discussed, and their effectiveness in covering materials such as wood, metal, steel, concrete, drywall and plaster is rated. The "Guide" is available at a \$2.00 charge for mailing and handling, from the Painting and Decorating Institute, 8705 North Port Washington Rd., Milwaukee, Wis. 53217.

**OPEN OFFICE PLANNING** / The Planning Guide used in connection with a company-sponsored series of professional seminars on open office design has been revised. New information includes the latest energy-saving products for the office, featuring task/ambient lighting and pre-wired panels, new workstations, floor space calculators, new components, and planning tips. ■ Westinghouse Electric Corp., Architectural Systems Div., Gateway Center, Pittsburgh.

circle 402 on inquiry card

**LUMBER SPECIFICATION** / Intended as a basic reference source of design values for selecting and specifying western lumber, the "Product Use Manual" includes standard size and grade information on western species, values for light framing and structural light framing materials, and other pertinent data on wood products for construction. The Manual also has span tables for joists, rafters and 2- and 3-in. decking, and covers machine stress rated lumber and end-jointed products. ■ Western Wood Products Assn., Portland, Ore.

circle 403 on inquiry card

**REDWOOD PLYWOOD** / Redwood plywood is shown used as siding for homes, offices and commercial buildings; the eight-page color catalog also illustrates panel characteristics and patterns. Technical data, code acceptances, and application instructions are included. ■ Simpson Timber Co., Seattle.

circle 404 on inquiry card

**WALLCOVERINGS/FABRICS** / The "Gloria" collection of fabric-backed vinyl and *Mylar* wallcoverings and companion fabrics is pictured in a four-page color brochure. Each of the 21 designs—large-, and small-scale florals, calico prints, and stripes—is shown in the 86 colorways offered. ■ James Seeman Studios, Div. Masonite Corp., Garden City Park, N.Y.

circle 405 on inquiry card

**RESILIENT FLOORING** / A 20-page catalog contains full-color illustrations of all colors and patterns in *Azrock* vinyl composition floor tile, asphalt floor tile, feature strip, and vinyl cove base. Product data and suggested applications are given for each floor. ■ Azrock Floor Products, San Antonio.

circle 406 on inquiry card

**PLASTIC FOAM INSULATION** / Thermostat urethane used in foil-faced *Thermax* sheathing, in thickness from 1/2- to 2 1/4-in, provides improved R-values, dimensional stability and durability in home insulating applications. A 20-page booklet explains the sheathing's advantages in frame and masonry wall construction. ■ The Celotex Corp., Tampa, Fla.

circle 407 on inquiry card

**APPLIANCES** / Residential equipment for kitchen and laundry are featured in a 24-page builders' catalog. Appliances include washers, dryers and commercial laundry units; freestanding, drop-in and built-in gas and electric ranges; range hoods; refrigerators; electric water heaters; and food waste disposers. Dimensions, basic installation instructions, and performance features are given for each appliance. ■ White-Westinghouse Appliance Co., Pittsburgh.

circle 408 on inquiry card

**EVAPORATIVE COOLERS** / The *Z-Duct* indirect evaporative coolers described in a product bulletin are capable of producing EER's of over 100. The literature explains the principals of operation and describes the various methods of installing *Z-Duct* units to operate alone or in combination with conventional air conditioning systems. Tables, charts and example calculations show how to determine the amount of cooling that can be expected under various operating conditions. ■ DesChamps Laboratories, Inc., East Hanover, New Jersey.

circle 409 on inquiry card

**INTERIOR TRIM** / Architectural moldings and artwork reproduced in resilient polymer are pictured in a 12-page catalog. Cornice moldings in a number of classic and contemporary styles are featured; all items are factory-primed to receive paint or a stain effect. New to the line are overdoor pieces, many based on designs from the Brighton Pavilion. ■ Focal Point Inc., Smyrna, Ga.

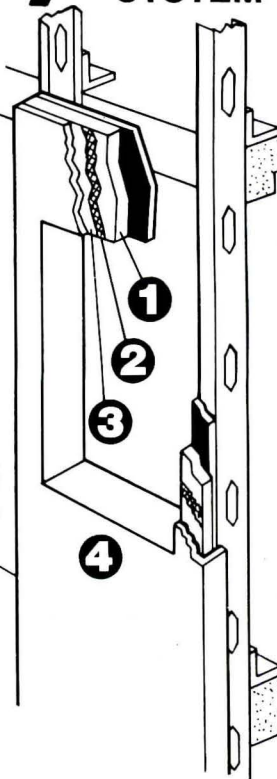
circle 410 on inquiry card

**FIRE DETECTORS** / The *Earli-Gard* line of smoke and fire detectors for single- and multi-family dwellings is described in a bulletin. The dual-ionization chamber detectors are available in direct-wired single- and multiple-station versions, as well as a battery-operated single-station model. ■ Square D Co., Lexington.

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# THE dryvit SYSTEM

Learn Why It Makes Sense!



- 1 First a rigid panel of Expanded Polystyrene that offers optimum insulating qualities. It becomes the foundation of any "U" value that is required to really control heating and cooling costs.
- 2 Our specially woven and treated Fiberglass Fabric that prevents surface cracking and that's important — no cracks mean no leaks or maintenance.
- 3 Our special Primus/Adhesive, a unique plaster material mixed with Type I Portland Cement to adhere Dryvit Insulation Board to the back-up surface and to embed Dryvit Reinforcing Fabric on the face of the board.
- 4 Dryvit Finish; a synthetic plaster material having high bond strength, extremely pleasing in appearance in a choice of 14 integral colors and various textures. It provides a water resistant, jointless exterior that is maintenance free.

**Lightweight Is Important**  
Only 7½ pounds per square foot, so you can reduce your steel usage substantially. Thinner walls also increase useable floor space.

DRYVIT SYSTEM, INC.  
Warwick, RI—Tulsa, OK

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At Dryvit We Speak A Rare Language...

# OUTSULATION™



## Out·su·lā·tion (n)

- 1: placing insulation on the exterior of the wall.
- 2: eliminating all thermal bridges.
- 3: the wall structure itself goes inside the building.

Frankly, the world needed this new word. The phrase "energy savings" has become so abused it is almost hackneyed. From a pup tent to a light bulb, its credibility is being challenged.

On the other hand, DRYVIT has been used as the exterior wall and insulation system on hundreds of projects in the last

decade. From 42-story prestige hi-rises, like the Tiara condominium above, to office buildings, sporting arenas, shopping centers, hospitals, schools and more. The actual energy dollars saved with the DRYVIT "Outsulation" System was much greater than design calculations projected (applying conventional heat loss calculations—R values and U factors).

DRYVIT places insulation on the outside of the structure, the most efficient placement for all building construction.

Thermal bridges are eliminated and the insulation value of the DRYVIT System is constant... unaffected by changes in temperature and moisture.

Make us prove it. We have meaningful case histories on all types of new construction and retrofit. Write or call stating your application.

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SYSTEM  
INC.





**Don't fight The System!  
GF's 570 Series works with —  
not against — your systems environment.**

Lightly scaled, softly sculptured and wonderfully comfortable, GF's 570 Series chairs are perfectly suited to the working environment of today...and tomorrow!

The soft, rolled seat and back and resilient, urethane covered structural steel frame feel good, look good and prevent damage to the surrounding furniture. Comfort settings adjust to the user's body—reduce muscle tension and fatigue.

Seven models in 3 frame colors are available in the full range of GF fabrics, leathers and vinyls.

Call your GF dealer or visit our showroom.

GF Business Equipment, Inc., Youngstown, Ohio 44501.  
In Canada: Toronto, Ontario.

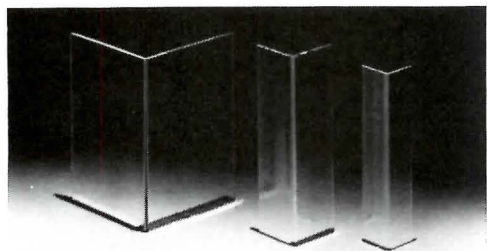


**GF** Office  
Furniture  
Systems  
GF Business Equipment



**LIGHTING CONTROL** / The "Architectural Series Control Panel" dims both fluorescent and incandescent lighting from one or more locations in a conference room, school auditorium, audio-visual room, etc. A longer, vertically sliding control channel provides easily repeatable, accurate settings; an optional "panic button" brings all lights in the system to full-bright instantly. The anodized aluminum units may have key switches for off-on control, and a "lock-out" feature that can override other control stations. ■ Decor Electronics Products, Div. Wide-Lite, San Marcos, Texas.

*circle 304 on inquiry card*



**CORNER PROTECTORS** / The *Lexan 101* resin, used for these transparent corner protectors is said to be more economical and esthetic than stainless steel, with higher impact strength than vinyl or acrylic. Intended to reduce maintenance costs and extend the life of tile, wallpaper, paint or paneling on exposed corners in high-traffic lobbies, schools, etc., the *Lexan* guards are easily installed or removed for reuse. ■ Tri-Guards, Inc., Wheeling, Ill.

*circle 305 on inquiry card*



**STORAGE LOCKERS** / Personal property lockers made of cold rolled and welded steel with colorful door/body combinations are offered with six locking configurations. A number of sizes and door models allow for a custom-designed look from standard components; accessories available in the British-made "Link 51" line include fixed and sliding coat hooks; mirror; scarf clip; and umbrella holder with drain cup. ■ Dahnz Industries Ltd., New York City.

*circle 306 on inquiry card*

**POWER-ASSIST DOOR** /

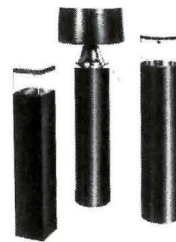


The UL-listed *Equalizer* door closer reduces the opening force needed to operate interior or exterior doors by as much as 75 per cent, facilitating use by handicapped, disabled or elderly persons. The unit looks and acts like a standard door closer until its built-in power assist is activated by the individual approaching the door (identified button on frame shown in photo). When passage through the doorway is completed, hydraulic spring power takes over, providing normal door control. There is an optional hold-open feature. ■ LCN Closers, Princeton, Ill.

When passage through the doorway is completed, hydraulic spring power takes over, providing normal door control. There is an optional hold-open feature. ■ LCN Closers, Princeton, Ill.

*circle 307 on inquiry card*

**LANDSCAPE LIGHTING** /



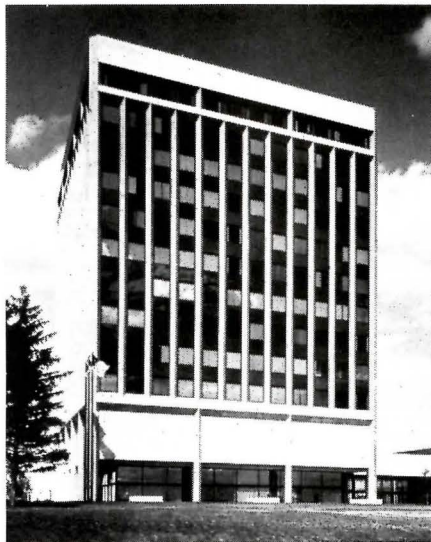
The "Sitelite 5" line is a comprehensive selection of bollards and compatible mid-level indirect post lights designed for the illumination of architectural landscapes. Round and square bollards are available in heights of 30-, 36-, 42-, and 48-in.; indirect post lights are in two

sizes of 16- or 20-in.-diameter, bracket-mounted on square poles or top-mounted on round poles. Wall mount units are also offered. Construction is of cast and extruded aluminum, fully weather-proofed, with impact-resistant diffusers. ■ McPhilben Lighting, Emerson Electric Co., Inc., Melville, N.Y.

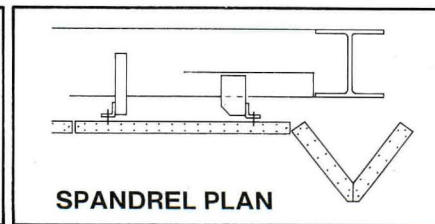
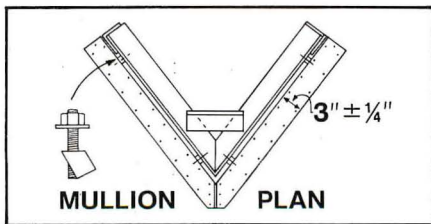
*circle 308 on inquiry card  
more products on page 159*

# Granite.

## The best in first impressions.



Architect: Graham Anderson Probst & White, Chicago, IL



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

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*Circle 70 on inquiry card*

# Orders from the Colonel.

The Kentucky Fried Chicken Corporation found a way to trim the fat out of new outlet construction: Trus Joist TJJ open-web steel and wood joists.

Once again, Trus Joist proved to be the most economical in-place structural system available.

On-site erection time is minimal. TJJ trusses were so light in weight, no special equipment or additional trades were needed. And they carried more load per unit of joist weight than any other structural component available; so the TJJ's saved on footings, foundations and bearing walls, too.

Trus Joist field technical representatives, backed by engineers and computer technology, filled the Colonel's orders on time and within budget.

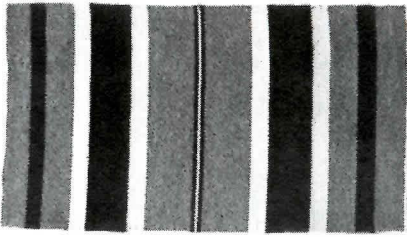
For information on eight different structural systems that won't cost you a wing and a leg, contact Trus Joist today.



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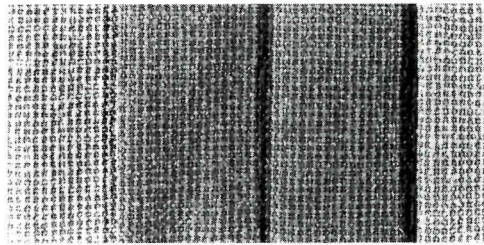
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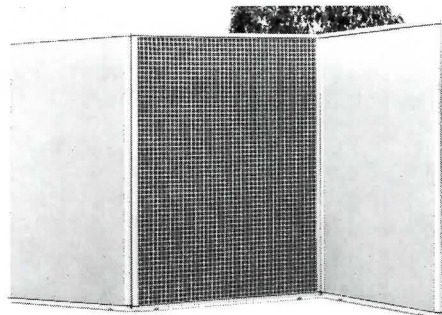
**HAND-WOVEN RUGS** / Representative of an international contract rug collection imported from India, Greece and Belgium is the "Macedonia" Kilim carpet shown above. Available in three variegated striped patterns, each in two different earth-tone colorways, this 92 per cent wool/8 per cent cotton rug is hand-woven in Greece. Sizes range from about 2½- by 5-ft to 5½- by 8-ft. ■ Cado/Royal System, Inc., Woodside, N.Y.

*circle 309 on inquiry card*



**CONTRACT FABRIC** / "Nylo Haitian" is a lofted textured fabric woven of heavy-duty nylon with an acrylic backing. "Nylo Haitian" is offered in 27 stock colors; the fabric is 54-in. wide and Zepel finished. ■ Design Tex Fabrics, Inc., New York City.

*circle 310 on inquiry card*



**MOVABLE PANELS** / Divide panels "hook and ring" fasten one to another for easy set-up and rearrangement; soft vinyl end contours serve as a light seal and safety cushion. Standard panel heights are 51-, 65-, and 89-in.; there are nine widths, from 12- to 60-in. Finish options include acoustical or non-acoustical inserts in a choice of ten fabric coverings. ■ Cole Business Furniture, Div. Litton Industries, Pa.

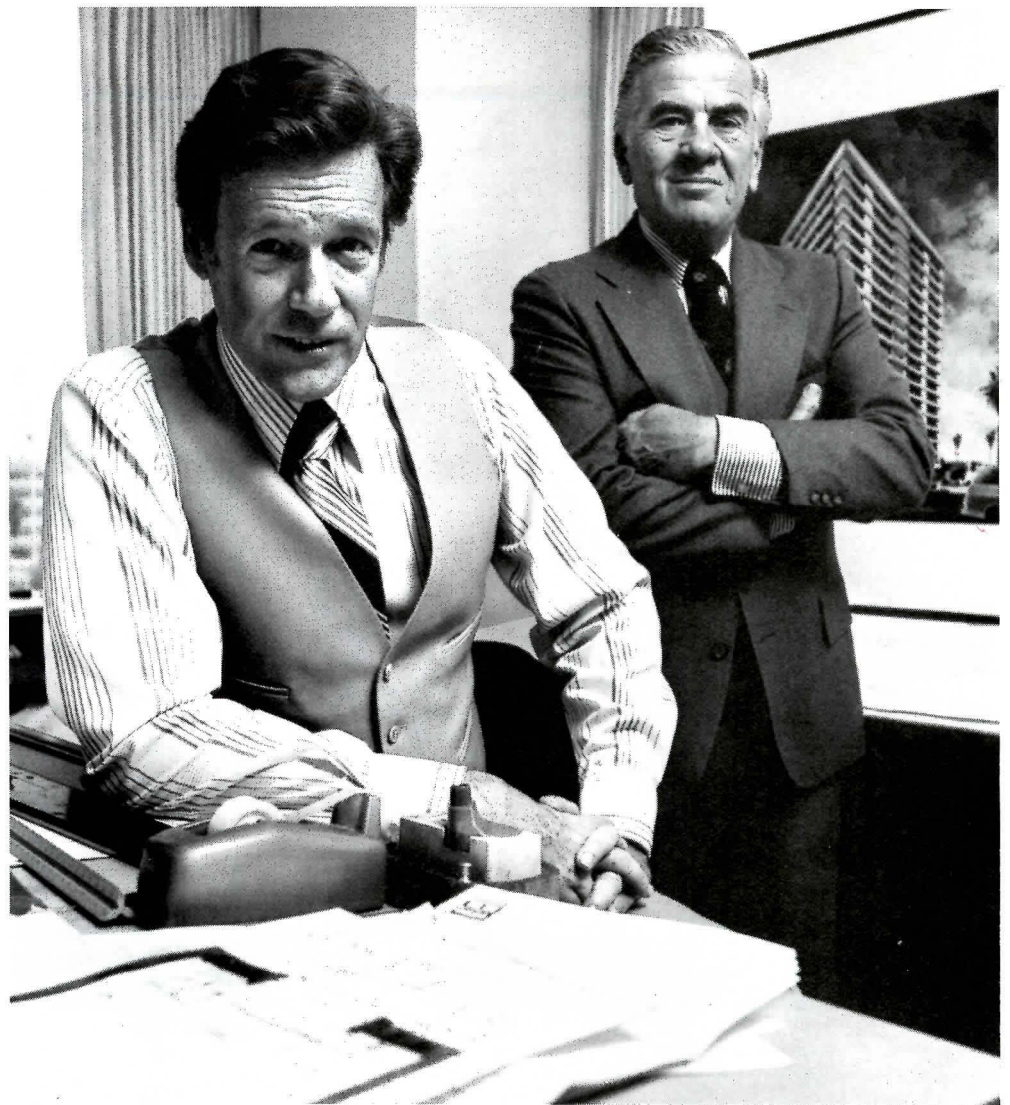
*circle 311 on inquiry card*



**CONFERENCE TABLE** / Designed by O.J. Holohan, the table shown here is an extension of the "Delta Oak" seating and desk collection. Tops of sliced white oak veneer or double-needle stitched vinyl are available in a variety of finishes and colors. ■ The Gunlocke Co., Wayland, New York.

*circle 312 on inquiry card*

*more products on page 165*



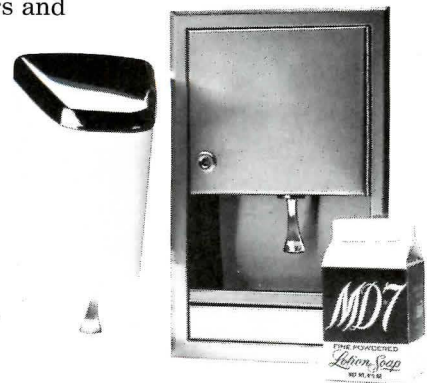
## "I went for design. He went for cost. We both went for powder dispensers."

As the designer of this building, I had two things to consider when I chose the soap dispensers for the washrooms. Cost and design. The building owner asked if there wasn't an alternative to liquid soap. He said the dispensers always clogged or leaked. He also mentioned there was more waste with liquid soap—and the dispensers always seemed to need refilling.

I suggested we try a fine-powdered soap. Specifically MD\*7. It's not gritty like an industrial powdered soap, so it is perfect for the washrooms in an office building. Still MD\*7 gets hands really clean, is gentle, and won't irritate normal skin. We decided to go with powdered soap. And with all the different styles in soap dispensers I found one that was perfect for the design of the washrooms.

I'll be installing powder dispensers and MD\*7 in all the buildings I design. And for good reasons. They please my eye, the tenant's hands, and my client's budget. Who says you can't please everyone?

For further information see Sweet's Catalog 10.16 Un.



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They transmit natural, diffused sunlight; and keep heated (and cooled) air in.

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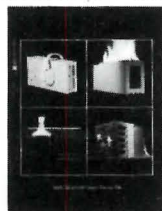
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## The hinge that hides



NOW YOU SEE IT



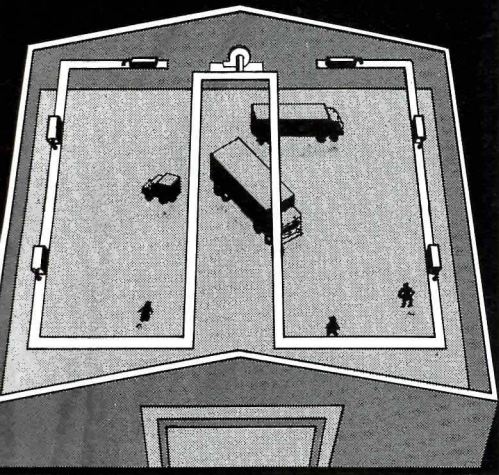
NOW YOU DON'T

The Soss Invisibles—for a custom look for any room! These amazing hinges hide when closed, eliminating unsightly gaps, hinges, and door jambs. They're the perfect hidden touch for doors, door-walls storage cabinets, built-in bars, stereos, and TV's. Specify the Soss Invisibles wherever looks matter. See listing in Sweet's or write for catalog: Soss Manufacturing Co., Division of Core Industries, Inc., P.O. Box 8200, Detroit, Michigan 48213.



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# THE CO-RAY-VAC HEATING SYSTEM CAN CUT FUEL USAGE 20%-50%



**The 17 year old vented radiant heating system that a lot of people don't know about.**

Co-Ray-Vac is a gas fired, fully vented, low intensity, infrared heating system.

**Low Intensity** Unlike glowing red "high intensity" infrared heaters, our system is a series of enclosed burners connected by radiant tubes or pipes. This unique design efficiently heats not only large areas like factories and airplane hangers but also offices, stores and restaurants.

**Infrared** Heats like the sun. Radiant heat is emitted from overhead tubes but not released until it strikes people or objects at floor level. Air temperature is raised when these objects give off heat. Heat is not wasted at roof level. Comfort is dramatically increased because the system provides draft free heat. It bathes an entire area in warmth.

**Gas-Fired** Does not use oil. Operates on natural or LP gas. Extremely high combustion efficiency, in the range of 90%, coupled with infrared heating principals, slashes fuel consumption. Users report fuel savings up to 50% over conventional heating systems.

**Fully Vented** No fumes. Saves fuel because extra ventilation is not required to prevent condensation caused by combustion.

**Ask the Man Who Owns**

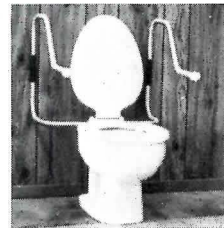
**One** Designed for new or retrofit installations in industrial or commercial buildings. Write or phone for information and names of users in your area. **Circle 77 on inquiry card**

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AR-1

**TOILET ACCESSORY /** "Helping Hands" support-



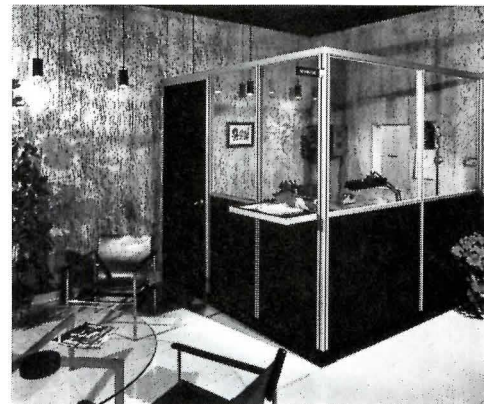
arms fasten easily and firmly to any existing water closet, allowing safer use by elderly or handicapped persons. For commercial and institutional applications, the supports are constructed of polished stainless steel tubing; hinged arms lift off floor for complete restroom cleaning. ■ Sperzel Industries, Inc., Litchfield, Minn.

*circle 313 on inquiry card*

**SPORTS LIGHTING /** Engineered specifically for the glare-free requirements of racquetball courts, this sports lighting system offers three levels of illumination, from 80- to 150- footcandles on a maintained basis. The tempered glass lens provides proper control and

eliminates breakage; the fixture is designed to fit all ceiling structures and has no trim to interfere with the ball bounce. Lights are virtually maintenance-free, requiring group re-lamping and cleaning once every two to three years, based on occupancy. ■ Devoe Systems, Carlstadt, N.Y.

*circle 314 on inquiry card*



**WORK STATIONS /** Marlite "System 175" partitions are shown here forming a receptionist's station. Factory-glazed panels come complete with duplex outlets, wall switches, circuit breaker panels and preformed conduit for the metal-enclosed raceways. The basic parts interlock easily with no exposed fasteners. Solid panel finish options include vinyl, fabric, melamine and fiberglass reinforced polyester. ■ Commercial Div., Masonite Corp., Dover, Ohio.

*circle 315 on inquiry card*

**WATER COOLERS /** The small size and low mounting height of the "Compact On-A-Wall" water cooler makes the unit especially suitable for areas serving younger children. The bubbler valve contains a built-in pressure regulator which

assures a smooth stream of water even if the inlet pressure drops to as low as 20 psi or increases up to 125 psi. Coolers are constructed on a rigid welded steel frame with demountable cabinet panels; Oasis "Compact On-A-Wall" units can provide water service for as many as 56 people. ■ Ebco Mfg., Columbus, Ohio.

*circle 316 on inquiry card*

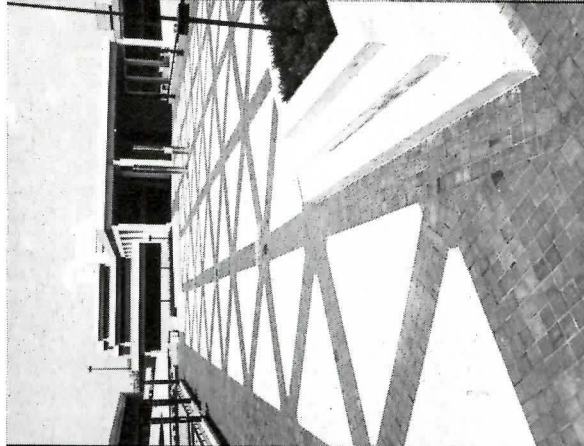
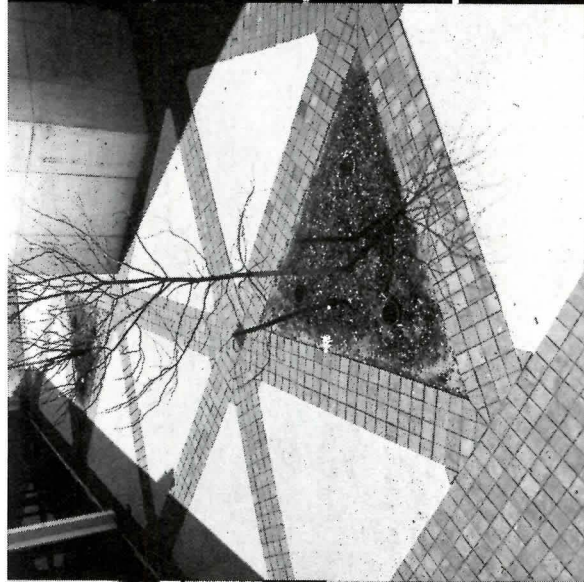
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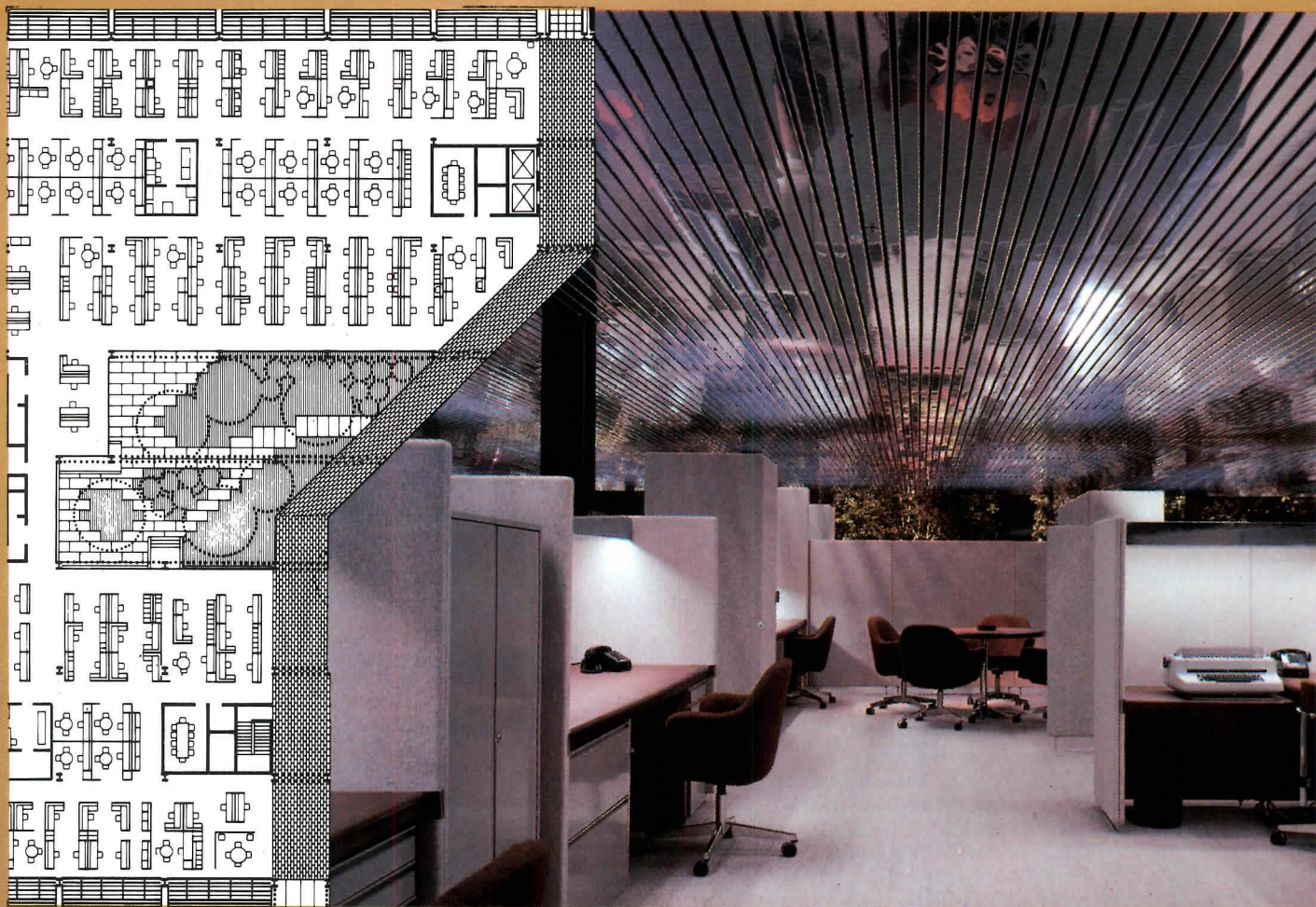
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- Department head interviews
- Additional facilities
- Determining Personnel & Operational Needs**
- Paper management
- Supplies
- Data processing, communications
- Security
- Environmental considerations
- Sociological considerations
- Determining Space Use**
- Fitting space needs to current management techniques
- Space standards
- Predicting growth
- Planning for flexibility
- Gathering Information**
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- Observation
- Using worksheets
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- Planning and using the budget
- The move
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- Reviewing the data with the client
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- Turning Program Data into Design**
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- Power & communications
- Security considerations

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**Lila Shoshkes** heads her own design and consultation firm, Lila Shoshkes Design Associates, in Millburn, New Jersey, specializing in corporate and institutional interior design and space planning. She is consultant to several architectural firms, and a noted author of books that have become standard reference texts for students of architecture and interior design.

She is the author of "Space Planning, Designing the Office Environment" (Architectural Record), and "Contract Carpeting, A Critical Guide to Specifications and Performance" (Watson-Guption). Formerly associated with ISD in New York, and The Grad Partnership, her clients have included AT&T, Massachusetts General Hospital, and the State University of New York at Buffalo. Her recent projects have included the U.S. Coast Guard at Governors Island, the West Orange (N.J.) Public Library, Newark Public Health Services building, and interior design and planning for many private corporations. She is a member of the Institute of Business Designers (IBD).

**Tyrone Pike** is an architect with The Ehrenkrantz Group, New York City, where he managed the Energy Efficient Office Building Interiors Cost/Benefit Study for the U.S. Department of Energy Solar Management Support contract. His current work in that regard involves simulating the energy usage in buildings with the computer program, CALERDA. Prior to joining The Ehrenkrantz Group, he served as project manager/architectural engineer on special projects at Dubin-Bloome Associates, P.C. Mr. Pike is a member of ASHRAE, and holds a Bachelor of Architecture degree, Princeton University.

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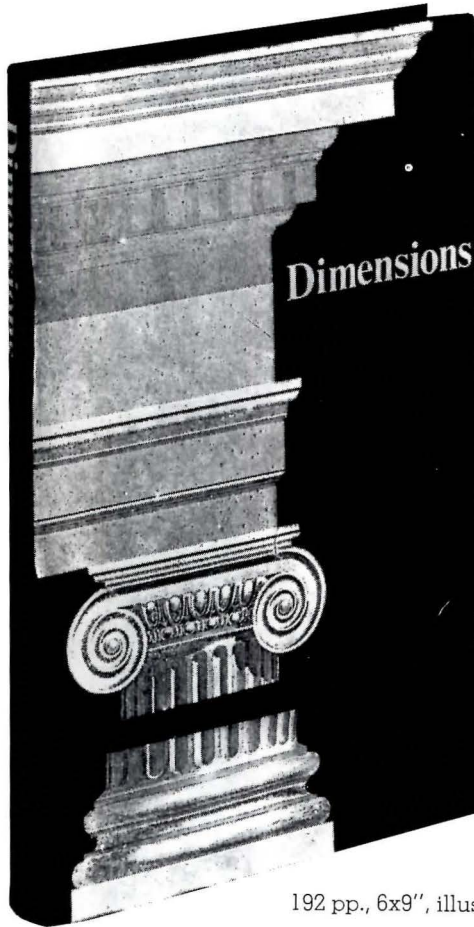
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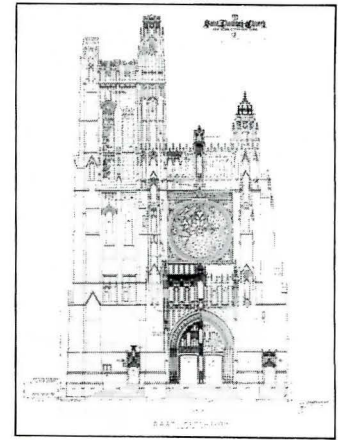
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## Modern housing dwelling units

MODERN HOUSING PROTOTYPES, by Roger Sherwood; Harvard University Press, \$25.00.

Reviewed by Robert A. M. Stern

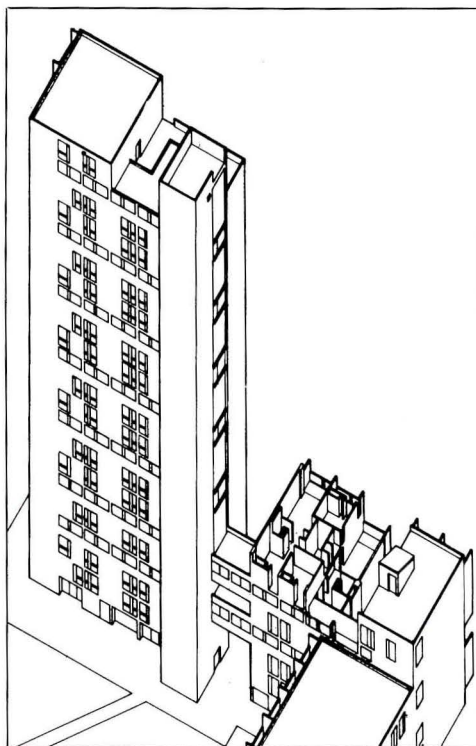
"The Modernists are different from us: they have more diagrams."

The design of multiple dwelling units—housing—is at a low point in its history. It suffers from a failure of imagination, it is hampered by an obsession with pragmatic problem solving and with technology, and it is virtually crippled by the lack of a sense of tradition. Every new apartment house is approached as though this building type had been invented in Marseille in 1949. Critics, too, in writing the history of the architecture of the past two hundred years, have largely ignored the problem of collective housing, preferring instead to concentrate on the parallel development of the high-rise office building and the other nineteenth- and twentieth-century building types that manifested technology and colossal size. These, after all, have been architectural characteristics paramount among what Sigfried Giedion called the "constituent facts" of our age.

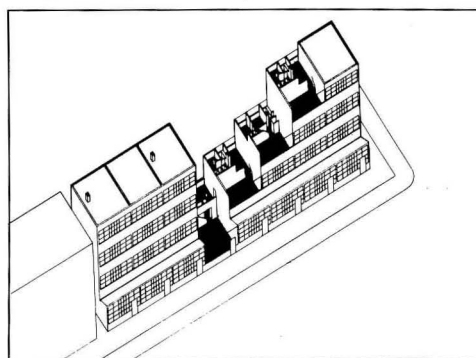
*Modern Housing Prototypes* is a handsome book (though its extensive use of blank white space surely contributes to its high cost). Like Andrew Alpern's book, *Apartments for the Affluent* (see RECORD, February 1976, page 43), it represents an important but highly frustrating step forward. This is to say that its principal virtue is a negative one, for its concentration on purely Modernist designs serves as a vivid reminder to us of how very few and how very diagrammatic were Modernism's genuine achievements in housing—an area on which its leading thinkers concentrated so much energy.

Sherwood's introductory essay attempts to establish a classification system for the various dwelling-unit and floor-plan types which he implies are fundamental to Modern housing; these are then discussed in some detail and illustrated with plans (sometimes too small to read), photographs, and specially prepared axonometric projections. These are the chief glory of the book—though they are not uniformly useful, and one wonders why the plans, too, were not redrawn for the book and reproduced at a uniform scale. All

Robert A. M. Stern's proposal for a thousand apartments was awarded a First Prize in the national competition for housing on Roosevelt Island in New York. His article, "With Rhetoric: the New York Apartment House," will appear in Volume 4 of *Via*, the journal of the School of Fine Arts at the University of Pennsylvania.



Peabody Terrace,  
Cambridge, Massachusetts, 1964  
Sert, Jackson, and Gourley



Zomerdijkstraat Atelier Apartment,  
Amsterdam, 1934  
P. Zanstra, J.H.L. Giesen, and K.L. Sijmons

of Sherwood's examples, then, are drawn from that body of work which Robert Venturi has slyly labeled "orthodox modernist," selected, that is, from that stream of work which until recently was accepted as the river of modern architecture and which now is coming to be seen as merely a mechanomorphological cubist tributary.

Sherwood's concept of just what constitutes multiple dwellings is also limited. He ignores, for instance, the issue of style (there is for him no such issue, presumably, since Modern architecture is meant to be without style, merely the inexorable product of program and technique). But by avoiding questions of style, he is able to devote his energies to issues of abstract composition.

Thus the design of multiple dwellings is seen as a three-dimensional puzzle in which units are assembled in relationship to each other in accordance with the dictates of various types, or *partis*. Here, then, is another limitation—not because style is thereby ignored, but also because any building that is compositionally complex or hybrid is automatically excluded. The works of important architects like Parker and Unwin (which are omitted) surely have as much to teach us about what Sherwood calls "detached and semi-detached housing" as the work of Frank Lloyd Wright (which is not). Sometimes the choices seem completely capricious. There are more examples of row housing than Sherwood hints at—including, again, the so-called "group house" developed by Parker and Unwin and so prevalent in the Garden City and Garden Suburb movements. And the section devoted to "party-wall" housing would have benefited by the inclusion of at least three types that have been overlooked: the amazingly inventive Los Angeles patio apartment of the 1920s (a model for high-density living that also responds to the demands of the car as well as to the need for distinct separations of public and private realms), Richard Norman Shaw's Albert Hall Mansions in London (with their extraordinary cross-sectional complexity), and any number of duplex apartments built in New York between 1900 and 1930.

All of these are excluded, one can only conclude, because they are merely modern, as opposed to Modern, and because simple to diagram they absolutely are not—which is not to say that they intricately adjust an ideal formal type to imperfect, real conditions. The section of the book devoted to "block housing" (by which Sherwood appears to mean housing built around the perimeter of a block and around a central courtyard) could easily have included Henry Hardenbergh's Dakota Apartments in New York of the 1880s and Sir Edwin Lutyens' Westminster (Page Street) Houses from the 1930s. Similarly, the section devoted to "slabs" is stunningly sparse: no Park Hill in Sheffield, no Pruitt-Igoe in St. Louis, No Robin Hood Gardens in London, and nothing of Giovanni Pisanella's contributions to the Twin Parks development in the Bronx in New York—all of which have important lessons to offer. The final section—"towers"—seems to describe the type quite well: is this where the author's sympathies really lie, or is it just that this is so simple a type that a few examples cover all the vases? In any case, another category should have been added, that of an as yet unlabeled, hybrid type combining the tower with the slab or

more Required reading on page 213

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**Europe: Architectural Guide 1860-Today** by Jeryll Habegger. 13 countries-500 Bldgs. with address, architect + date. 150 illus. \$4.50. Order from: Architectural Guidebook, 421 West Belden, Chicago, Illinois 60614.

with the perimeter block. Examples of this are Irwin Chanin's Century Apartments in New York (1930-31), Frank Lloyd Wright's Crystal Heights project (1941), and Davis Brody's Riverbend in New York (1968).

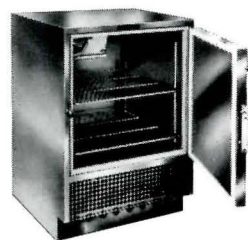
The quality of apartments as places to live is rarely discussed in *Modern Housing Prototypes*. The interiors of the "dwelling units"—a loathsome planners' term for apartments that has the effect of reducing them to mere cells—are almost never illustrated. Twenty-seven projects are discussed, and there is only one interior photograph and only a few that suggest the kinds of spaces that the buildings make as they relate to the landscape and to other buildings. This omission leaves unaddressed the question of the intrusiveness of the architect's formal language into the private realms of the inhabitants. As for semi-public spaces like lobbies, corridors, galleries, and courtyards, and public spaces like plazas and streets, which sociologists have argued are at least equal in importance to the "dwelling unit," there is almost no discussion at all. Problems of access, car storage, and community facilities—problems which arguably do separate the housing of our time from that built before World War II—are also ignored.

The defects of the book, then, lie within the limited scope of the selections and an almost exclusive concern with organizational—as opposed to environmental and symbolic—aspects of the multiple dwelling. They are also attributable to failures of scholarship, as are indicated in the author's discussion of Le Corbusier's *Immeubles Villas* project (1922). Though he takes at face value Le Corbusier's claim that the project was based on the *Certosa di Ema* (giving no citation for just where this claim was actually made), he neglects to point out that the courtyard-apartment type with an outside gallery circulation actually has a considerable history as workers' housing in London, and that these types, as well as Le Corbusier's, probably owe a debt to the Phalansteries of Fourier, whose phrase "a house, a palace" captures the symbolic essence of the multiple dwelling.

So what is one to make of this book, which promises much more than it delivers, yet is still the best of its kind produced in our time? *Modern Housing Prototypes* gives abundant testimony to the strengths, and the weaknesses, of the Modernist method—to its preference for diagrammatic clarity over formal complexity, its rejection of the compromised or commonplace solution, its inability to deal correctly with image and metaphor. While it is true, as Sherwood's book makes very clear, that the Modern Movement has contributed to the rational design of the apartment unit, it is not true, as the author seems to imply, that an emphasis on efficient planning and adequate ventilation are enough to ensure success. Under the sway of Modernism, architects have lost the habit of thinking of individual buildings as fragments of a larger whole, in the social, functional, and cultural as well as in the physical sense. Buildings are not merely functional diagrams, they are cultural artifacts.

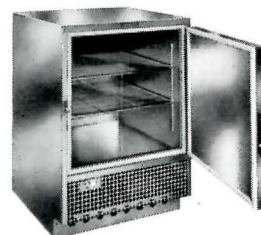
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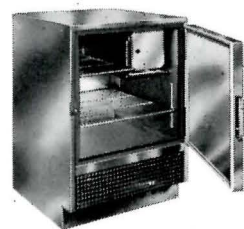


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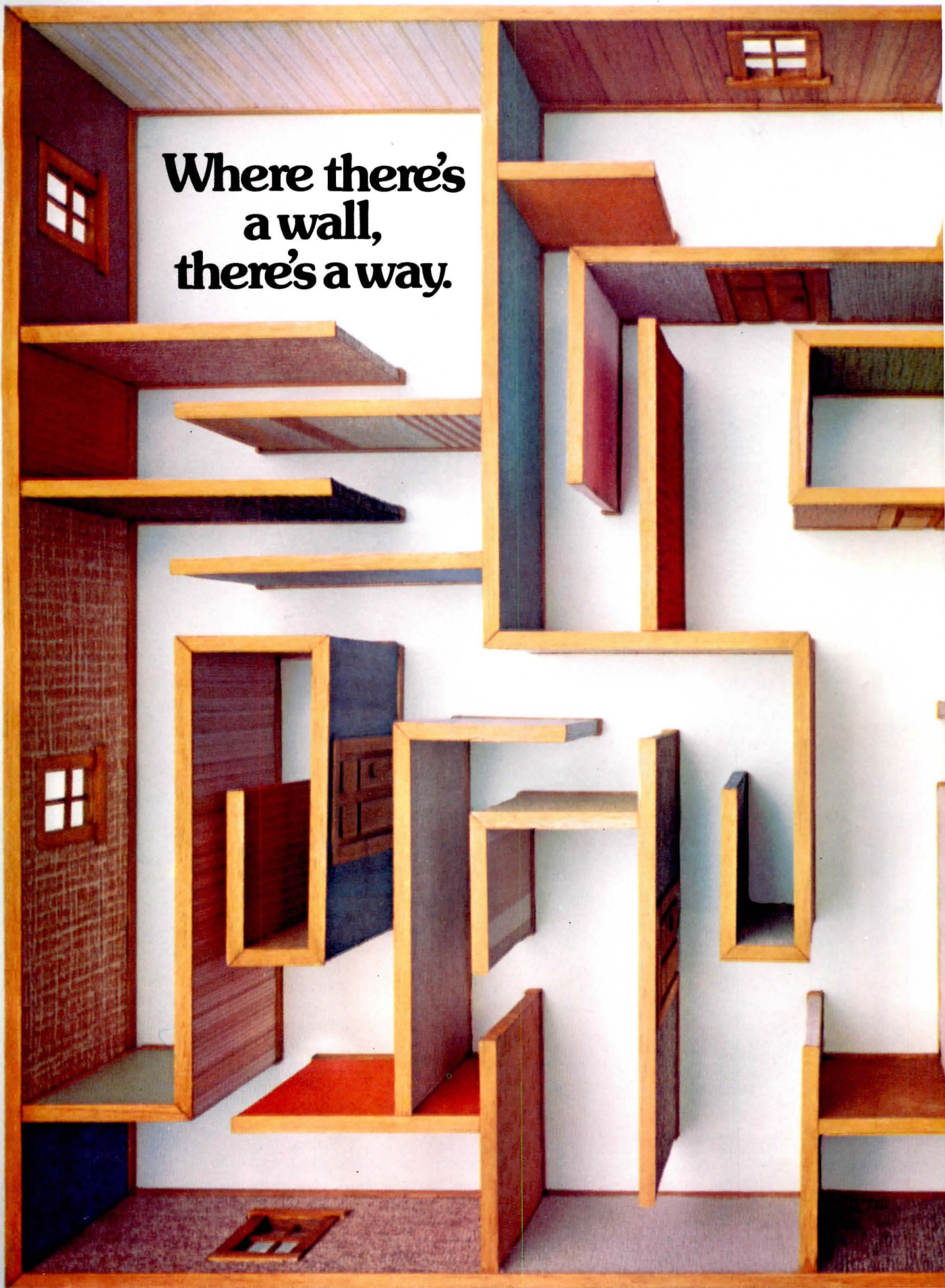
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