THE NEW AUSTRALIAN EMBASSY IN PARIS BY HARRY SEIDLER & ASSOCIATES

NEW DIRECTIONS FOR AN ESTABLISHED FIRM: MARQUIS ASSOCIATES

NEW RESIDENTIAL DESIGNS BY HUGH NEWELL JACOBSEN

BUILDING TYPES STUDY: EXISTING STRUCTURES OFFER A HELPING HAND TO HEALTH CARE

FULL CONTENTS ON PAGES 10 AND 11

ARCHITECTURAL RECORD

NOVEMBER 1978 11 A McGRAW-HILL PUBLICATION FIVE DOLLARS PER COPY

The Brigantine® commercial floor from Armstrong. At this Massachusetts high school, good looks and durability earn it the highest grades in its class.

Responding to a need to conserve energy while maintaining effective illumination, the Armstrong C-60 Ceiling System delivers handsomely. It provides lighting of a quality superior to that of a widely accepted 4-lamp 2′ x 4′ troffer installation but uses 40% less energy year after year.

The performance comparison shown below is keyed to the growing recognition that the classical footcandle is an incomplete measure of lighting effectiveness. In practical office situations, light rays strike the work surface from many angles. At any given point, some fixtures are providing high-quality illumination without glare. But other fixtures are projecting light at bad angles, producing "veiling reflections" that hinder the visual task instead of aiding it.

Classical footcandles measure only the amount of light reaching a point without attempting to identify how much of it is really useful. But there is a more sophisticated measure of lighting efficiency that does. Called Equivalent Sphere Illumination (ESI), it determines the *quality* as well as the quantity of light being supplied. It far more precisely measures how well the viewer can see what he is doing in every square foot of a specific room for a specific type of visual task.

With just one lamp per five-foot-square coffered module, the Armstrong C-60 assembly provides ESI levels greater than the conventional 4-lamp troffer arrangement but uses far less wattage.

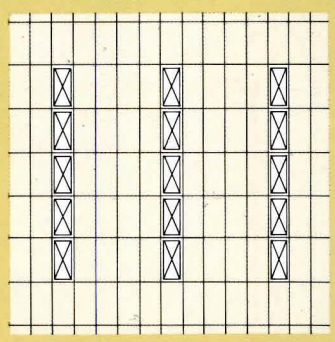
A brief comparison of the two systems is shown in the table below. That data is part of our informative new "Light Wars" show. "Light Wars" is a highly entertaining 30-minute program that includes a filmed explanation of ESI and documents how the C-60 System, in a 100,000-square-foot installation, can save as much as $29,000 per year at today's energy costs. To see "Light Wars," or receive a free booklet on ESI and the C-60 Ceiling System, mail the coupon below.

FROM THE INDOOR WORLD® OF

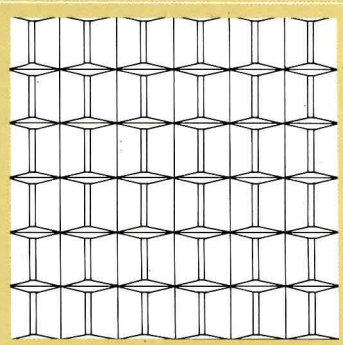
Armstrong

Circle 2 on inquiry card

Systems Performance Comparison*



2′x4′ Recessed Troffer



Armstrong C-60 Luminaire

Prismatic	Fixture lens	Prismatic
4	lamps/fixture	1
15	no. of fixtures	36
	classical footcandles	
127	initial	90
95	maintained	70
40	ESI level	44
3.07	watts/sq. ft.	1.84

*30′x30′x9′ room; task—ESI pencil. All test data was supplied by independent laboratories; complete information available on request.

Armstrong
4201 Rock St.
Lancaster, PA 17604

____Yes, I would like to see your 30-minute "Light Wars" presentation. Please call for an appointment. Phone:_____

____Yes, I would like a free copy of your booklet on ESI and the C-60 Ceiling System.

Name_____

Title_____

Firm_____

Street_____

City_____ State_____ Zip_____

Letters to the editor

I read with interest your comments in the September issue regarding our "troubles in too many buildings."

Having somehow developed and perfected the art of biting off much more than I can chew, I suggest that a foolproof first step for fellow architects and engineers is to start small. A nationwide movement to address the problems you highlight is either doomed to bureaucratic overkill or will take so long to implement as to be ineffective. Therefore, I urge that every—and I do mean every—project receive a post-mortem.

The project post-mortem is easily implemented in the small office. The project architect and engineer simply have a general discussion with fellow team members and others in the firm. For larger and more diversified organizations, the post-mortem may need to be presented in written format. (Of course, our lawyer friends will encourage us not to write about many of the problems, so we may quickly return to the informal or semi-formal verbal presentation.) With regard to subject, the post-mortem can and should consider design, production techniques, details, construction phase coordination, client satisfaction—yes, the whole spectrum.

I have worked for firms ranging in staff size from three men in a remodeled house to 900 architects and engineers in offices throughout the U.S. In both of these extremes in size, the project post-mortem was practiced religiously. Frankly, I cannot find one thing wrong with the idea.

Scott W. Braley, Associate
Heery & Heery
Architects & Engineers
Atlanta

Your editorial reasons for much of the present-day building problems hit the nail on the head, but why be so timid in your declarations?

Competition among the professionals to design cheap framing systems has been going on for several years. If you have a reputation for designing cheap structures that will "hold up in court," you will have a lively practice, especially with the speculators.

Everyone you listed is at fault because it is accepted that things must be substandard so each will survive to collect a profit.

Harry L. Percy, Jr., AIA
Yakima, Washington

Your editorial in the September issue struck a responsive chord. For every building failure or problem that is reported in the press there are literally hundreds and thousands that are not at all publicized, almost all of which never even get to litigation.

I am doing one or two energy audits per week in various and sundry buildings across the country. Inevitably there are problems ranging from minor to major which are evident to me and to the building owner, yet nothing is typically done about these problems. In too many cases the designer is not even aware that problems exist because the owner either doesn't wish to make an issue out of it or he just isn't aware that something is not performing properly.

Certainly publishing the causes and remedies for these problems would be of great benefit to the professional who is concerned. Unfortunately there are too many professionals who are not concerned about these problems. Yet, I still believe that it would be a good idea. The question is—where should this material be published? Certainly the widely circulated journals (with advertising) are not the place.

I believe that there are enough situations that are without legal entanglement so that a monthly publication could go on for years and years.

Your idea concerning a round table is a good one. You might wish to consider setting forth a couple of new ground rules, such as total anonymity for the participants and avoiding the mention of specific building projects, owners and professionals. There are enough professionals who have been involved as either expert witnesses in law suits or who have specialized in solving building problems or who have had a substantial portion of their practice in this area. One indication of this is the recent flurry of contracts let by GSA nationwide for roofing consultant services. If there was ever one area where there are problems, this is it. Yet rarely ever in literature do you see anyone baring his soul about how the roof that he designed or built had failed.

I commend you for your editorial and I certainly hope that something comes out of it.

Lawrence G. Spielvogel
Consulting Engineer
Wyncote,
Pennsylvania

As one reads the September editorial, "Too many troubles . . . ," he may well be reminded of a remark made by the late Hoosier astronaut, Gus Grissom, when asked his thoughts while sitting in the capsule during the long countdown. "It's quite a sensation to realize you are sitting there on top of 90,000 parts supplied by the lowest bidders." Gus didn't survive one of the low bidder's systems.

There is, today, altogether too much "bottom linesmanship" in the construction industry from top to bottom, much of it semi-concealed in second and third tier subcontractors and/or product selection. This is at least part of the trouble, but by no means all of it.

The failures we hear about are the catastrophic or dramatic ones. For every one of them there are

continued on page 153

Calendar

NOVEMBER

Through Nov. 17 Biennale, from the 1976 Venice Exhibition "Suburban Alternatives," U.S. Premiere; AA Gallery, Yale School of Architecture, 180 York St., New Haven, Conn.

13 Seminar, "Laying the Legal Groundwork for Design/Build Ventures," sponsored by ARCHITECTURAL RECORD, with briefing by Arthur T. Kornblut, Attorney; Peachtree Plaza, Atlanta. Program will be repeated Dec. 15 at Century Plaza, Los Angeles, and Jan. 15 at Hyatt Regency, Houston. Contact: Charles Hamlin, ARCHITECTURAL RECORD SEMINARS, 1221 Avenue of the Americas, New York, N.Y. 10020. Phone: 212/997-3088.

13-15 Conference on Case Studies of Downtown Success, sponsored by the Downtown Research & Development Center; Warwick Hotel, New York City. Contact: DRDC, 270 Madison Ave., Suite 1505, New York, N.Y. 10016.

13-15 52nd Annual Meeting of the National Electrical Manufacturers Association, Hyatt Regency Cambridge, Mass. Contact: NEMA, 2101 L St., N.W., Washington, D.C. 20037.

13-16 National Urban Forestry Conference, sponsored by the SUNY College of Environmental Sciences and Forestry, the U.S. Forest Service, and the Pinchot Consortium for Environmental Forestry Studies; International Inn, Washington, D.C. Contact: Dean, School of Continuing Education, SUNY College of Environmental Science and Forestry, Syracuse, N.Y. 13210.

13-27 Indian-American Symposium on Architecture and Urban Design Education, sponsored by the Indian Institute of Architects and Texas A&M University College of Architecture & Environmental Design. Contact: Texas A&M University, College of Architecture & Environmental Design, College Station, Texas 77843.

15-17 4th Annual Meeting of the Construction Research Council, Monteleone Hotel; New Orleans. Contact: Adriana Villars, CRC Meeting Coordinator, 1000 Vermont Ave., N.W., Washington, D.C. 20005.

21 Opening of the design exhibition, "Vienna Moderne: 1898-1918," at the Cooper-Hewitt Museum, 2 E. 91st St., New York City.

21-25 The Association of Student Chapters/AIA National Student Forum, "The Hottest Issues Under the Sun: Housing, Energy and Environment," sponsored by the University of Idaho ASC Chapter; Moscow, Idaho. Contact: Joanne Reece, PR, Forum 78, P.O. Box 3243, University of Idaho, Moscow, Idaho 83843.

28-Dec.1 Solar Heating & Cooling Systems Operational Results Conference, sponsored by U.S. Department of Energy; Broadmoor Hotel, Colorado Springs, Colo. Contact: The Conference Group, Solar Energy Research Institute, 1536 Cole Blvd., Golden, Colo. 80401.

ARCHITECTURAL RECORD (Combined with AMERICAN ARCHITECT. ARCHITECTURE and WESTERN ARCHITECT AND ENGINEER)
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Quotations on reprints of articles available. Every possible effort will be made to return material submitted for possible publication (if accompanied by stamped, addressed envelope), but the editors and the corporation will not be responsible for loss or damage.
EXECUTIVE, EDITORIAL, CIRCULATION AND ADVERTISING OFFICES: 1221 Avenue of the Americas, New York, N.Y. 10020.
PUBLICATION OFFICE: 1221 Avenue of the Americas, New York, New York 10020. Controlled circulation postage paid at Strasburg, Va.
OFFICERS OF McGRAW-HILL PUBLICATIONS COMPANY: Gordon L. Jones, president; Paul F. McPherson, executive vice president; Gene W. Simpson, group vice president; senior vice presidents: Russell F. Anderson; James E. Boddorf, planning and development; Ralph R. Schulz, editorial; vice-presidents: Denis C. Beran, European operations; David P. Forsyth, research; James E. Hackett, controller; Eric B. Herr, economics; Thomas H. King, manufacturing; Robert L. Leyburn, circulation; John W. Patten, sales; Edward E. Schirmer, international.
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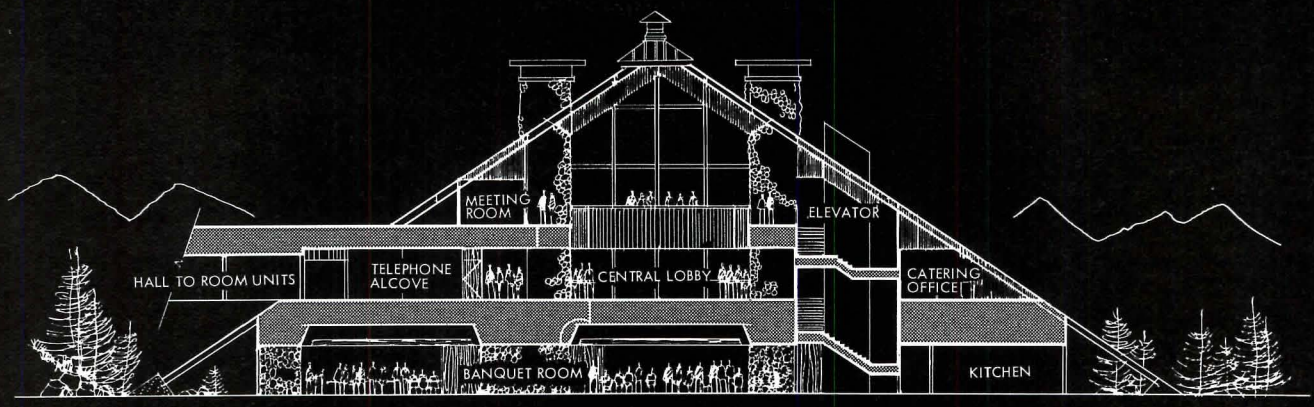
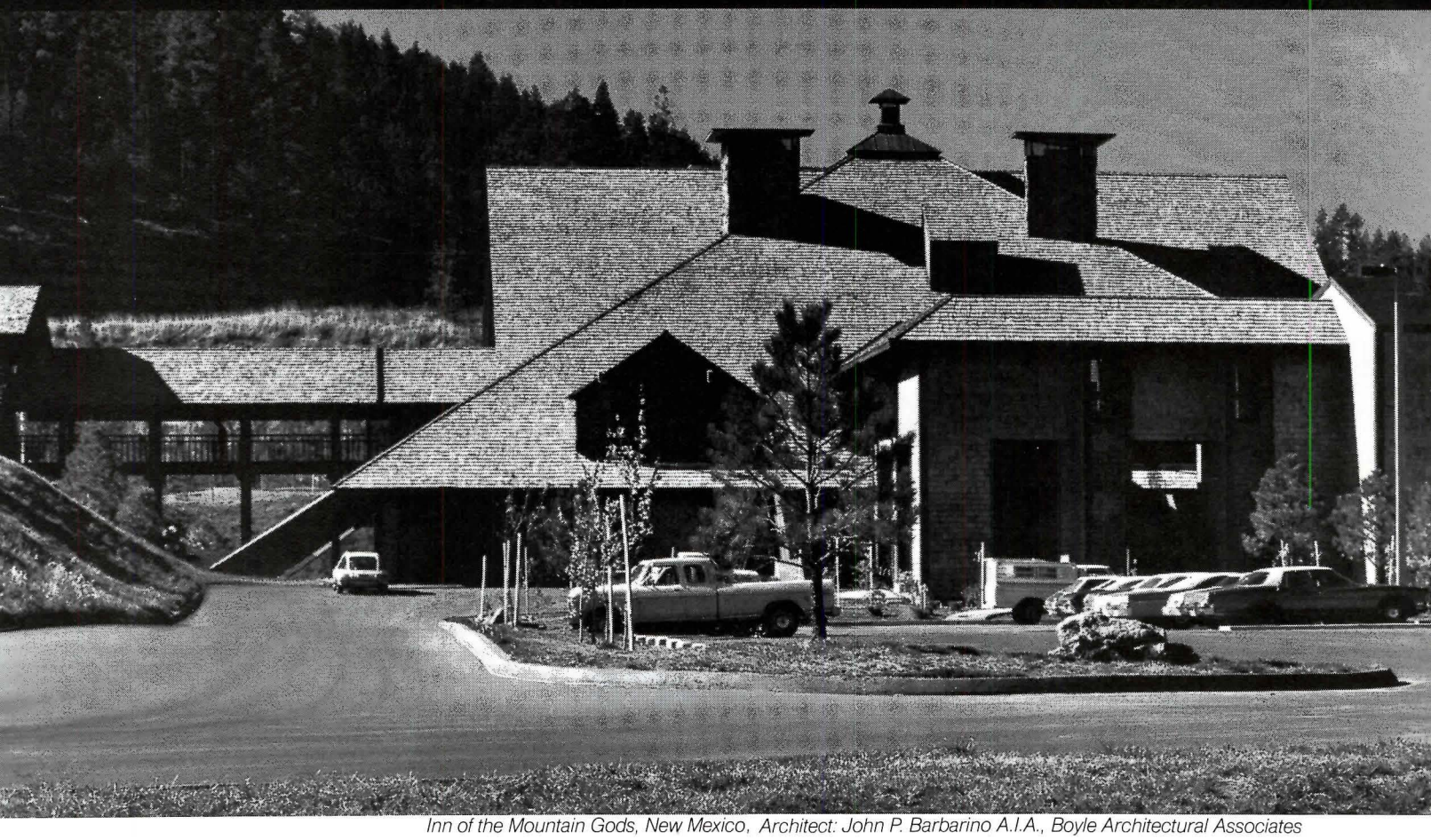
GUARANTEE: Publisher agrees to refund that part of subscription price applying to unfilled part of subscription if service is unsatisfactory.
ASSOCIATED SERVICES/McGraw-Hill Information Systems Co.: Sweet's Catalog Files (General Building, Engineering, Industrial Construction and Renovation, Light Residential Construction, Interiors), Dodge Building Cost Services, Dodge Reports and Bulletins, Dodge/SCAN Microfilm Systems, Dodge Management Control Service, Dodge Construction Statistics, Dodge regional construction newspapers (Chicago, Denver, Los Angeles, San Francisco).
THIS ISSUE is published in national and separate editions. Additional pages of separate editions numbered or allowed for as follows: Western Section 32-1 through 32-6.
POSTMASTER: PLEASE SEND FORM 3579 to Fulfillment Manager, ARCHITECTURAL RECORD, P.O. Box 430, Hightstown, N.J. 08520



Red Cedar helps a resort mirror its mountain setting.



Inn of the Mountain Gods, New Mexico, Architect: John P. Barbarino A.I.A., Boyle Architectural Associates

At this resort near the Sierra Blanca mountains in New Mexico, the massive main lodge is connected by covered corridor-bridges to a series of separate guest buildings.

The architect's challenge was "to design an architecture that would complement and blend with the natural environment. Buildings were literally threaded through existing trees and land forms, then sheathed with red cedar shake roofs and shingle sidewalls to create an architecture most consistent with the surroundings."

Naturally at home with nature, richly textured red cedar shingles and shakes also create a strong unity among all structures on the site, insuring continuity for future guest-room additions.

On the practical side, red cedar is highly insulative, and retains its natural good looks for years with minimum upkeep.

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These labels under the bandstick of red cedar shingle and shake bundles are your guarantee of Bureau-graded quality. Insist on them.

Insulative ("R") values of roofing products shown below. Source: ASHRAE Handbook, and California Energy Design Manual.

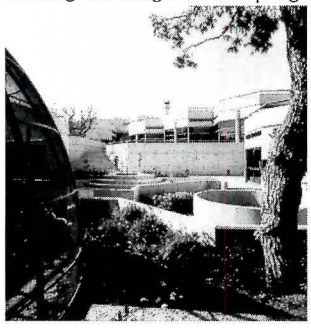
Cedar Shakes (Heavy)	1.69
Cedar Shakes (Medium)	1.15
Cedar Shingles	.87
Built-Up Roofing, Slag	.78
Asphalt Shingles	.44
Built-Up Roofing, Smooth	.33
Asbestos Cement Shingles	.21
Slate	.05

Red Cedar Shingle & Handsplit Shake Bureau

Circle 6 on inquiry card

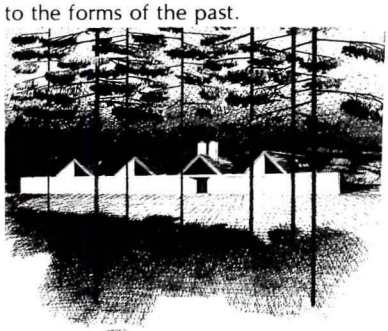
The new Australian Embassy Paris, France
Architect: Harry Seidler & Associates
Photographer: Max Dupain

THE RECORD REPORTS



ARCHITECTURAL BUSINESS

FEATURES



BUILDING TYPES STUDY 524

ARCHITECTURAL ENGINEERING

NEXT MONTH IN RECORD

Building Types Study: Federal Architecture—An agenda for quality
What is the Federal Government doing, or what should it be doing, to make design quality an integral function of its policies, programs guidelines, and procedures? This issue of RECORD will assess initiatives underway in the General Services Administration, the Veterans Administration, the Department of the Navy, the Corps of Engineers, the Department of Housing and Urban Development—and some 20 other agencies entrusted with construction responsibilities or with financially assisting construction at the local level. The Administration's Urban Policy, and its evolving Cultural Policy, will also be addressed, as will the impact of recent and proposed legislation bearing on the humanity, harmony, and convenience of the physical environment.

Let the sun shine in.

Brighten things up with MODUSPAN,® the space frame that opens new horizons for interior design. Pictured below: The Orange Park Mall in Jacksonville, Florida. Where our space frame experts provided the design and technical assistance needed to turn an architect's vision into reality. For more information about Moduspan... call the Unistrut Service Center nearest you. Or see our catalog in Sweet's. It'll shed some light on your latest design.

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UNISTRUT | GTE

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On training young graduates: Some useful "how-to" from NCARB

In the August editorial, I argued that "The graduate who arrives at your door looking for a job is a talented survivor—who has gotten that far mostly on his or her own. Help them the rest of the way. If you cannot offer them a job, make some phone calls and help them find one. Train those you do hire as you wish you had been trained by your first employer . . ."

Well, that editorial got a lot of comment—and not all of it from from students and recent graduates saying "yeah, yeah!". One of the most thoughtful—and a good follow-up—came from Lorenzo ("Pete") Williams, president of the National Council of Architectural Registration Boards. While we published his letter in October letters, I would like to repeat parts of it here and add a supportive note of my own:

Writes Pete: "I applaud your August editorial appealing to practitioners that they step up their material and moral support of young graduates entering our profession . . . Good advice, to be sure, but not really the latest or best, since you neglected to steer employers toward NCARB's Intern-Architect Development Program—the IDP.

"With IDP, it is no longer necessary for an architect-employer to go it alone; a firm needn't invent a regimen for its interns. IDP is designed to give all interns the opportunity to gain the training and experience that will make them better architects than we've ever produced before.

"One of architecture's notable cooperative efforts—one involving the leadership commitment for several years of NCARB, AIA, ACSA and ASC-AIA—the IDP is now available to interns on a statewide basis in six states, and in many other states [see list below] the registration boards and AIA components have expressed their readiness to implement the program in the near future. I can foresee, within several years, that IDP will in fact be a nationwide system of internship training. . . . The main thrust of IDP is to make internship in architecture as structured and meaningful a learning experience as any other form of education. It consists of a record-keeping process, an advisory system, and a supplementary education program."

This program is indeed one of the most efficient ways that registered architects can train young graduates "as you wish you had been trained." The IDP program is now formally in place in six states—California, Texas, Iowa, Kansas, Mississippi, and New Jersey. In those states, a growing number of architects are committed to running the young graduates they hire through a structured and carefully monitored internship period—getting useful work from them to be sure, but structuring that useful work so that the intern is well prepared not just for his licensing examination but for responsible practice after that.

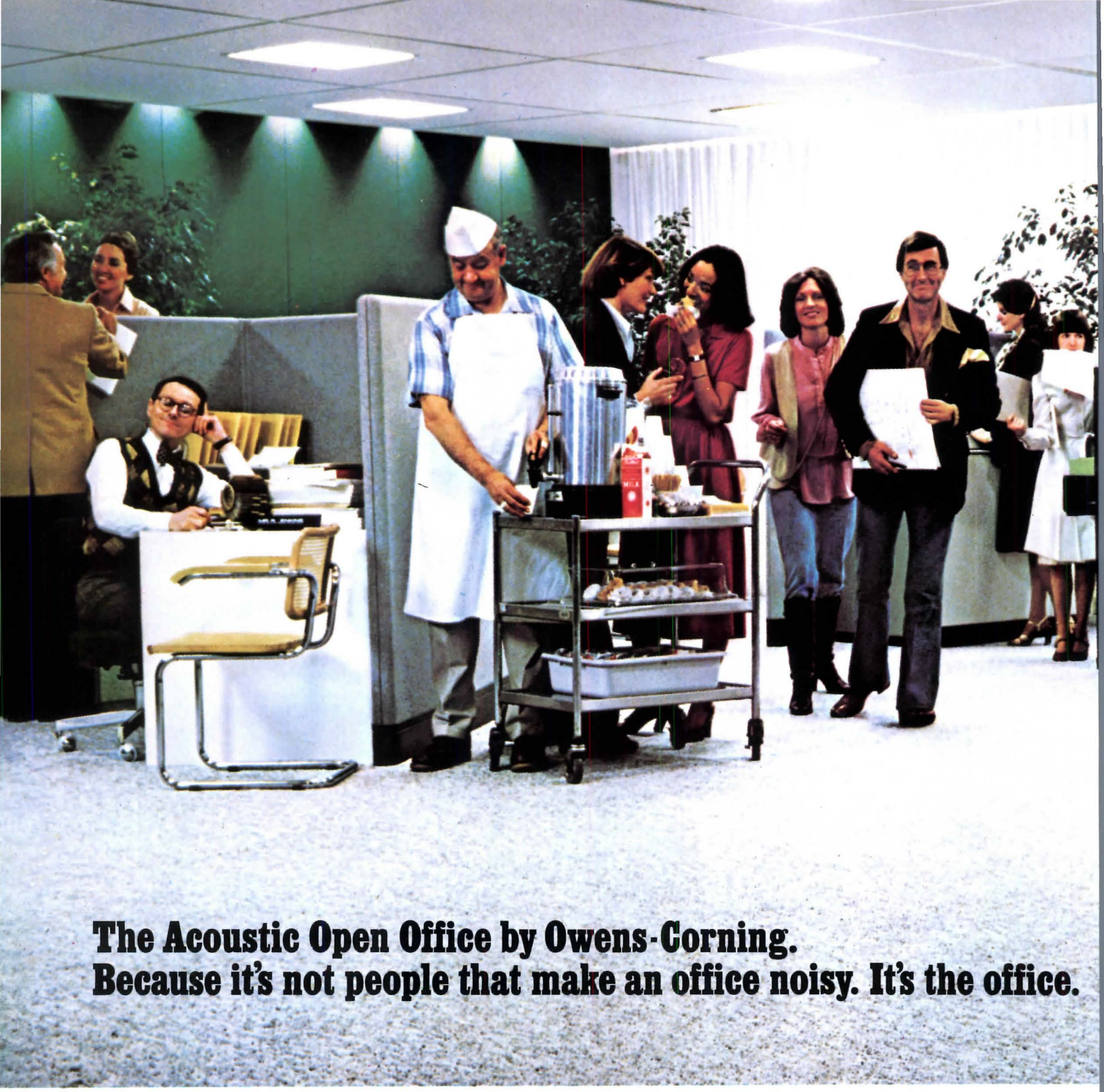
According to NCARB, formal agreement on the IDP program is near in many other states—including all six New England states, Indiana, Kentucky, Louisiana, Michigan, Montana, Nebraska, Oklahoma, South Carolina, Tennessee, Utah, and West Virginia.

But even in other states, the IDP program does offer useful guidance to both the practicing architect and to the young graduate. Specifically:

- Any architect can write to the NCARB (at 1735 New York Avenue, N.W., Suite 700, Washington, DC 20006) for a copy of "Information for IDP Sponsors and Advisors." This publication spells out—for any registered architect who is interested in training young graduates "as you wish you had been trained"—how to become a professional sponsor to the young people in your office, or how you can serve as an impartial, third-party professional advisor to interns in other local offices. The goal—even those in states which have not or will not adopt the IDP program formally—is a program of work for young employees which will not be just cost-effective for the office, but complete the young graduates' education and preparation for the licensing examination.
- And any student or graduate (indeed, anyone interested in preparing for the licensing exam) can write to the NCARB and ask for a copy of the IDP Manual—the booklet used to record the intern's work experience in the IDP program. While few interns will be in a position to do much dictating about the nature of the work assigned him or her, the booklet will provide a guide to shoot at—a guide to the kind of work that NCARB considers critical to intern development and eventual licensing.

In short, formally in some states and informally in others, NCARB and cooperating firms do have a useful pattern for "training young architects as you wish you had been trained." It's worth a letter to Washington.

—Walter F. Wagner Jr.



The Acoustic Open Office by Owens-Corning. Because it's not people that make an office noisy. It's the office.

People can't help but make noise while they work. Not much you can do about that.

What you can do something about are noisy walls, floors, ceilings, and furniture—the hard surfaces that reflect and broadcast every little sound people make.

Design an open office acoustically, and these surfaces can actually be used to *control* noise.

Not too noisy, not too quiet.

The Acoustic Open Office by Owens-Corning is a system of components designed to reduce the overall noise level *and* create the conditions that allow speech privacy.

It's made up of five basic elements:

An Acoustic Ceiling made of Owens-Corning Fiberglas* ceiling boards that works so well absorbing sound it's earned a Noise Isolation Class of 20. (The open sky has a perfect rating of 23.)

Sound dividers divide space *and* provide speech privacy. Each divider has a sound-absorbent core of Fiberglas.

Acoustic Wall Panels to soak up deflected sounds that hit the wall.

In 1979, the construction industry can expect a fall in housing and a rise in some nonresidential construction, according to the *Dodge/Sweet's Construction Outlook: 1979* published by McGraw-Hill Information Systems Company. The forecast credits worsening inflation, tight money, budgetary restraint and slowing economic growth for putting an end to the three-year-long expansion of construction markets, but says also that "the industry is *not* headed for anything like the 1974/75 collapse." Details on page 65.

Labor costs in construction are rising at an average rate of 6.6 per cent, or 72¢ per hour, reports the Collective Bargaining Services Division of the Associated General Contractors of America. The AGC body bases its figures on 302 collective bargaining settlements concluded through August this year.

"The construction industry is currently riding the crest of a boom," says George A. Christie, chief economist of the F.W. Dodge Division of McGraw-Hill Information Systems Company. He cautioned that, in a period of credit restraint, "the decline of homebuilding may be only a few months away," although August contracts, rising 12 per cent above last August's figure, continued at a record pace. "Contracting for commercial and industrial buildings has been bounding up and down within a range that could only be described as somewhere between high and very high." August nonresidential contracts, at $3.9 billion, were merely high.

The executive and legislative branches have hopped on the solar bandwagon for their Washington offices. The White House will install solar collectors on its West Wing, and the House of Representatives will install collectors on two of its office buildings. Details on page 35.

Congress has funded a cost study for the conversion of Washington's Pension Building as an exhibition center, a major step in the establishment of a National Museum for the Building Arts. Details on page 37.

The Museum of Modern Art signalized the reviving interest in the architecture of Sir Edwin Lutyens in a major retrospective exhibit of his work last month. Details on page 34.

HUD has chosen 118 cities and towns to participate in the first phase of its neighborhood strategy program. The program, which reflects the continued determination of HUD Secretary Patricia Roberts Harris to "revitalize, rebuild and rejuvenate our cities," will disburse $160 million over the next five years to rehabilitate housing in neighborhoods selected by the participating communities.

The Department of the Interior is conducting a series of "Technical Workshops for Architects on Rehabilitation," with special application to historical buildings. The one-day program covers such technical concerns as moisture, masonry and retrofit, as well as tax incentives and regulations. Future programs are scheduled for Ann Arbor, Michigan; Lincoln, Nebraska; Columbia, South Carolina; San Francisco; Seattle; Albany, New York; Baltimore; Salt Lake City; and Burlington, Vermont. For information: John H. Stubbs, Historical Architect, Office of Archeology and Historic Preservation, U.S. Department of the Interior, Washington, D.C. 20242 (202/523-5891).

Vecta Contract, furniture manufacturer, has launched "an aggressive search for new product designs," writes company president William H. Sullivan. "The search extends to designers with established international reputations and to those with ability who have lacked a vehicle for their talents." Before submitting material, interested designers should contact Vecta Contract, 740 West Mockingbird Lane, Dallas, Texas 75247.

The average American homebuyer paid $55,600 for a house in September, and paid 9.75 per cent mortgage interest, the Associated Press reports. Economist Richard Marcis of the Federal Home Loan Bank Board thinks the purchase price for housing may go up 10 per cent in 1979, though interest rates might fall ¼ to ½ per cent. On the other hand, economist Michael Sumichrast of the National Association of Home Builders predicts a rise in both purchase price (from 12 to 14 per cent) and in mortgage interest.

The GSA celebrated the start of renovation on Washington's landmark Old Post Office, furthering its policy of restoring historic buildings to government use. Details on page 37.

Two Rotch Traveling Scholarships will be awarded for 1979, one for $11,000, the second for $6,000. The 1979 Rotch Scholar will receive his stipend for nine months' foreign travel ($1,000 upon his return), and the 1979 Second Rotch Scholar will receive five month's travel ($500 upon his return). Applicants must be U.S. citizens under 35 years of age, with an architectural degree from a Massachusetts school or professional experience in a Massachusetts office. Written requests for application forms must be received no later than January 22 by Hugh Stubbins, Secretary, Rotch Traveling Scholarship, 1033 Massachusetts Avenue, Cambridge, Massachusetts 02138.

GSA probes uncover no corruption in its building activities, but preventive measures may affect A-E procurement

In the wake of scandals rocking the General Services Administration, officials are instituting new procurement rules and practices that they think will help cut down on the opportunities for corruption.

So far, the taint of corruption has not surfaced on the agency's architect-engineer selection procedure. But Administrator Jay Solomon is reviewing those procedures to see if changes are warranted.

He has told a congressional committee that the Public Building Service has devoted too much manpower to "administrative trivia" and not enough attention to "procurement review and reviews of architectural drawings."

Mr. Solomon has also reinstituted what he calls "a common business policy" of retaining 5 per cent of contractor payments until all work is substantially completed so the government will have leverage in possible disputes with contractors.

An Office of Acquisition Policy has been established, too, to coordinate the agency's approach to procurement practices.

Federal grand juries in a number of cities, including Baltimore, Salt Lake City and Chicago, as well as the District of Columbia, are still looking into corruption by GSA employees and contractors who deal with them. Most of the attention so far has focused on the Federal Supply Service, the wing of GSA that buys and distributes commercial office supplies to Federal agencies.

Concurrently, however, other investigators have been looking into charges involving the agency's maintenance and alterations and repair activities. There are charges that painting contractors, for example, may have paid GSA building superintendents for certifying that work was done when actually it was not.

The Congress is also active in the GSA probe, and there is speculation that the scandal may benefit backers of a completely revamped procurement system designed to be more flexible and to lead to more competition among contractors.

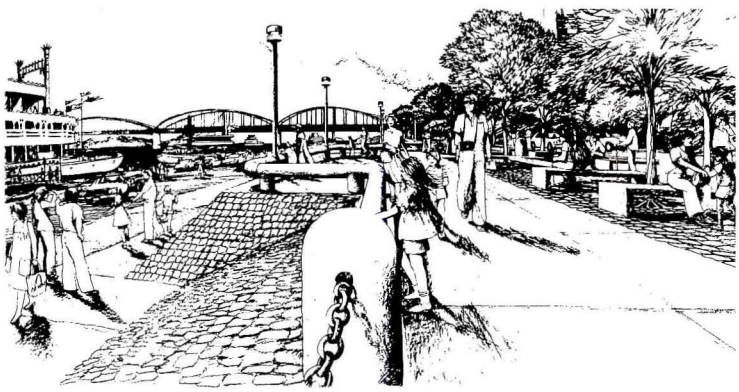
Usually the government deals with corruption by tightening up procurement practices, but Sen. Lawton Chiles (D-Fla.), chairman of the Subcommittee on Federal Spending Practices, thinks the solution to GSA's problems might rest on a more flexible approach to procurement.

The bill Sen. Chiles has introduced makes no mention of the Brooks Law, which specifies that all civilian agencies should select A-Es on the basis of qualifications.

What the bill would do is to discourage procurement officials from preparing detailed specifications and encourage instead the use of functional, or performance, specifications. A "sunset" provision would mean that each procurement specification and regulation would have to be justified periodically or go out of existence.

Sen. Chiles says the bill would "minimize favoritism and collusion" by giving all qualified sources the opportunity to compete for, and to win, contracts.

This legislation has been approved by the Senate Governmental Affairs Committee and is presently being reviewed by the Senate Armed Services Committee. Sen. Chiles plans to push for early Senate consideration when Congress reconvenes next year. The bill would go to the House, where a lengthy study is expected. — *William Hickman, World News, Washington.*



St. Louis plans recreational development of its riverfront

St. Louis's Central Riverfront, a mile-long stretch of levee along the Mississippi with the city's signature Gateway Arch at its center, attracts many visitors, both natives and tourists. Eero Saarinen's Arch (properly the Jefferson National Expansion Monument) draws more than 3 million visitors yearly, and these people are likely to visit also the historical riverboats permanently moored along the levee and the redeveloped Laclede's Landing, as well as the neighboring downtown business district.

The city, perceiving some of the Central Riverfront's inadequacies as a link for the various activities along it and as a recreational pedestrian environment, has embarked on a $3.6-million improvement program, designed by the St. Louis planning firm Team Four, Inc.

The levee itself imposed two unarguable design constraints. Its primary purpose is, of course, flood control—waters have risen as high as the steps to the Arch. Moreover, the long sloping cobblestone surface provides both mooring for working and pleasure vessels and parking for automobiles.

In answer to flood waters, the designers propose the use of granite, concrete, heavy-gauge steel tubing and hardy plant life that can be easily maintained and that can resist the effects of immersion and battering by floating debris.

To make both mooring and parking more efficient, and to increase safe pedestrian access, the planners propose the reorganization of these functions on a 70-ft module defined by new utility trenches and walkways extending to the riverbank. Mooring rings will also be placed on the module and, as much as possible, out of harm's way for pedestrians. (For non-riparian readers: river vessels tie up to a mooring barge, which is in turn fastened by chains to rings sunk in the levee pavement. Permanent gangways give pedestrian and vehicular access to barges.)

At the top of the levee, a short steep slope will separate a lower pedestrian walkway and a higher promenade. Widened areas along the promenade will have seating and planting, and at either end a "passive" park will provide vistas and picnic tables. A large viewing plaza will be added to connect the levee with the steps in front of the Arch, and a viewing barge will be moored on the river.

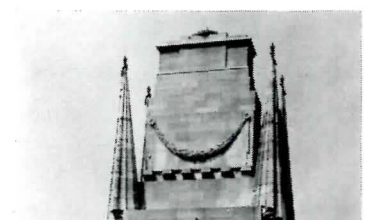
Lutyens retrospective opens at Museum of Modern Art

Some 30-odd years after the death of Sir Edwin Lutyens, the architect enjoys a reviving reputation as architects and scholars take a fresh and sympathetic look at the 20th-century design eclipsed by the International Style. New York City's Museum of Modern Art last month opened what it believes to be the first American retrospective of Lutyens's work. The exhibit, "The Architecture of Sir Edwin Landseer Lutyens," will remain on view until January 7.

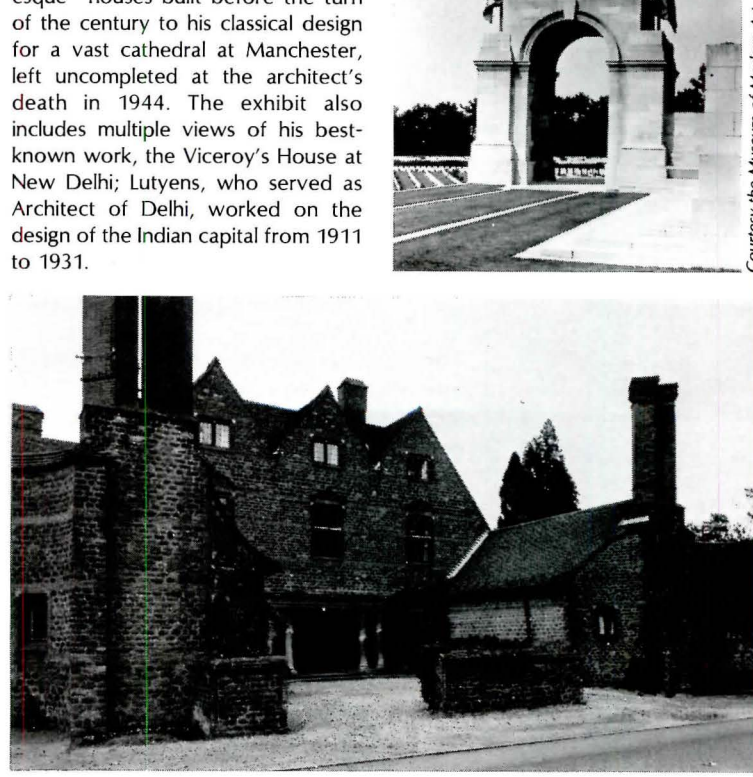
The collection, assembled by the Museum's guest director Allan Greenberg, contains 16 examples of Lutyens's work, ranging from "picturesque" houses built before the turn of the century to his classical design for a vast cathedral at Manchester, left uncompleted at the architect's death in 1944. The exhibit also includes multiple views of his best-known work, the Viceroy's House at New Delhi; Lutyens, who served as Architect of Delhi, worked on the design of the Indian capital from 1911 to 1931.

Among the buildings shown in the exhibition are Tigbourne Court in Surrey (at bottom), designed in 1899 in collaboration with the horticulturist Gertrude Jekyll, and a series of war memorials built after World War I, including that at Etaples, France (immediately below).

The Museum will also sponsor a public lecture by Mr. Greenberg, "Edwin Lutyens: A 20th-Century Architect," on November 27 at 8:30 P.M.



Courtesy the Museum of Modern Art



Boston photographic exhibit celebrates industrial milltowns

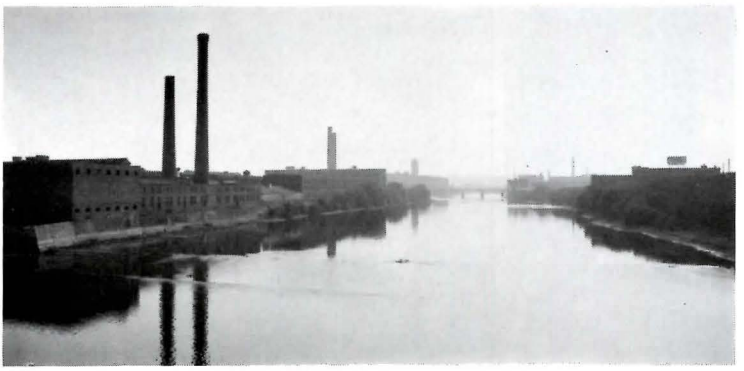
The 19th-century mills of New England engaged the attention and imagination of Ralph Langenbach some eight years ago when he was still a student of architectural history and he has since spent considerable time, film and travel to amass photographs of these urban complexes.

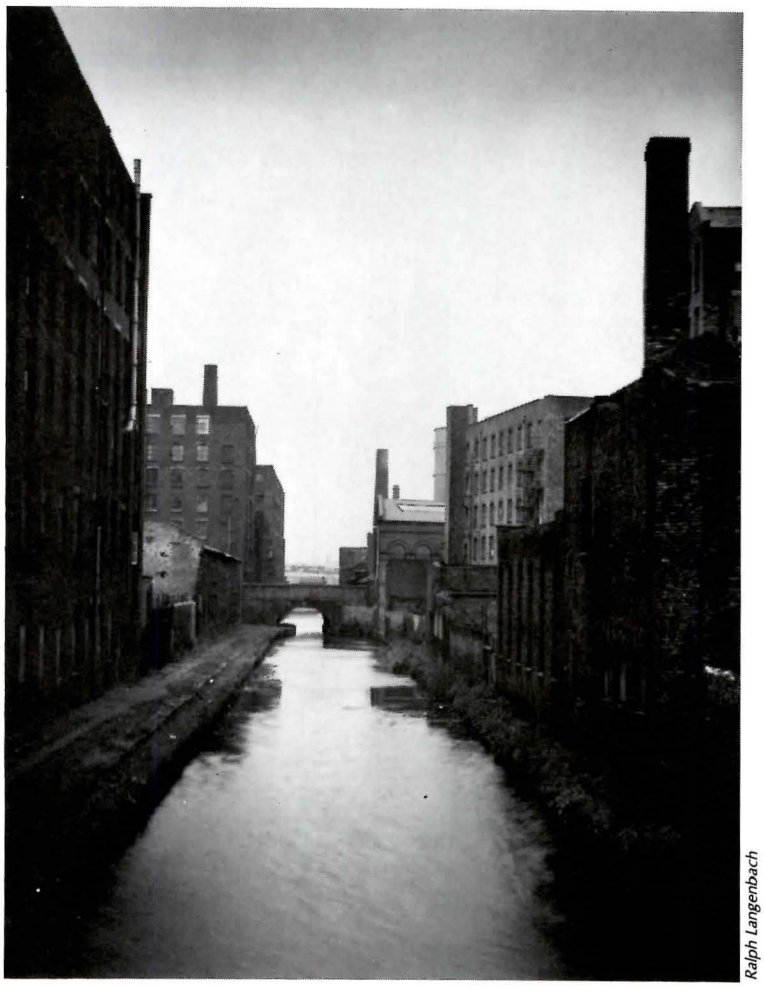
Some of the fruits of his research were shown last month in the exhibit "A Sense of Place: The Milltown in England and New England," shown at Boston City Hall's Main Gallery.

Among the photographs shown in Boston were views of the Amoskeag mills in Manchester, New Hampshire, now demolished (see below and right), as well as Massachusetts mills at Lowell (now the Lowell Historic National Park), Lawrence, Fall River and North Uxbridge, and other locations in New England, Yorkshire and Lancashire.

The exhibit included a number of outsize architectural photomurals, some as large as 6- by 10-ft, as well as smaller prints mounted in clear acrylic, all suspended from the ceiling. Other photographs showed milltown people and their style of life and work; in addition to Mr. Langenbach's work, this collection included photographs by Lewis Hines made earlier in the century.

The exhibition corresponded with the publication this month of the oral history *Amoskeag, Life and Work in an American Factory City,* by Mr. Langenbach and social historian Tamara K. Hareven.





Ralph Langenbach

The House of Representatives announces plans to install solar-energy systems in two of its office buildings . . .

The House of Representatives last month approved spending $3 million to equip two of its office buildings with solar devices.

Legislative authority is still not complete—the Senate must also authorize the project, and both houses must then appropriate the funds. Approval of all steps seems likely, however.

Architect of the Capitol George M. White has already completed a preliminary study. On the basis of his findings, the lawmakers decided to put the solar devices on the Rayburn House Office Building and on House Office Building Annex No. 2.

On Mr. White's recommendations, the Congress decided against a proposal to put similar systems on the Longworth and Cannon office buildings because they lack properly oriented roof space.

The Rayburn building is to get a flat-plate collector system that would be stationary, while the system on the Annex would have concentrating collectors that track the sun.

Mr. White says the two collectors would save over $4.5 million in utility costs over 20 years, assuming a modest increase in conventional energy costs.

The Rayburn Building's $1.2-million system will be designed to provide 46 per cent of the building's annual energy requirements for domestic water heating, winter preheating of outdoor air supplied to the induction heating system, and summer reheating for cooled air.

The system on Annex No. 2 will cost an estimated $1.3 million and will be designed to provide 24 per cent of the building's annual energy requirement for domestic water heating, heating for building radiation, and partial building air conditioning. The House computer center is located in this building and requires year-round cooling.

Included in the money authorized by the bill is $500,000 for monitoring devices and for consulting fees.—*William Hickman, World News, Washington.*

. . . and the White House will get solar-heated hot water

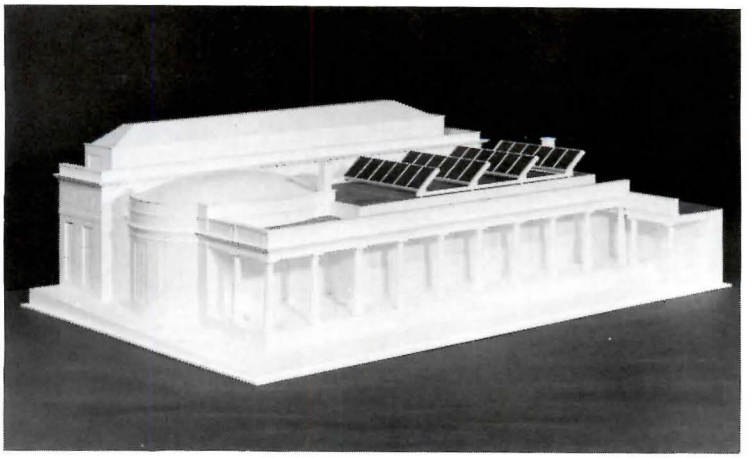
The White House, which more than a year ago announced that it would install a solar-energy system, expects now to have collectors in place by early spring next year.

Though reduced in scope from earlier designs—it will provide only domestic hot water for the West Wing—the installation will offer "a major signal that the solar age is here," according to Omi Walden, Assistant Secretary of Energy for Conservation and Solar Programs.

The design calls for a 600-sq-ft array of four collectors mounted on the roof above executive office space. The earlier, more ambitious design called for balustrades and other camouflages to preserve the Executive Mansion's appearance. In the present design, the collectors, though discreetly located, will be visible from the south lawn. A 600-gallon storage tank will be dug in one of the basement mechanical rooms.

At a press conference late in September, Hugh A. Carter, Jr., Special Assistant for Administration, acknowledged that the solar installation's chief value is symbolic. "It is marginal from the breakeven standpoint." Asked by a reporter whether he meant that the system was not cost-effective, Mr. Carter answered, "It's a little bit on the negative side."

As symbols in Washington go, however, this one is inexpensive. The installation wil cost about $24,000, and will provide 76 per cent of the West Wing's hot water at an estimated saving of $1,000 per year.



The system was designed for the Department of Defense by PRC Energy Analysis Company, mechanical engineers of McLean, Virginia, and Mueller Associates, of Baltimore with the Ehrenkrantz Group, New York architects.

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Congress approves funds for Pension Building renovation

The effort to establish a National Museum for the Building Arts moved a major step closer to reality last month when Congress approved funds to study the cost of converting the Pension Building into an exhibition center that would probably be operated by the Smithsonian Institution.

Several legislative steps must still be taken, but approval of the cost study is seen as a critical milestone. David O. Meeker, executive vice president of the American Institute of Architects, said the okay was "a clear statement of congressional intent on the future use of the Pension Building so that needed work can begin and a more precise description and cost estimate for the museum project can be obtained."

The resolution approved by the Congress authorizes the General Services Administration to spend $60,000 on the cost study. In addition, the Smithsonian and the National Endowment for the Arts were provided $10,000 each to aid in refining the proposal offered last year by the National Museum of the Building Arts, Inc., a nonprofit corporation advocating the facility.

Dr. Cynthia R. Field, president of the corporation, has explained to congressional committees that approval of the cost study would allow her group to obtain Federal advice on "vital physical and programmatic factors to be considered" in establishing the museum.

The approved resolution said the term "building arts" encompasses "all practical and scholarly aspects of architecture and landscape architecture; engineering; building and construction; urban planning, design, physical development, and renewal; and historic preservation."

Dr. Field, an architectural historian, estimates the cost of renovation of the Pension Building at $12 million; its adaptation as a museum would add approximately $1.5 million.

The Pension Building is a huge red brick structure constructed between 1882 and 1887. It was designed by Gen. Montgomery C. Meigs of the Corps of Engineers. A highlight is the court, which is framed by eight 76-foot Corinthian columns, surrounded by four tiers of galleries and lighted by clerestories.

Dr. Field and other advocates of using the structure as a museum cite it as an example of energy-saving construction. — *William Hickman, World News, Washington.*

Washington ceremony marks start on Old Post Office

A ceremony marking the beginning of renovation work on the Old Post Office in Washington was held at the end of September, with First Lady Rosalynn Carter and Joan Mondale, wife of the Vice President, doing the honors.

The 80-year-old Richardsonian Romanesque structure, with its 135-foot clock tower, anchors the south side of Pennsylvania Avenue midway between Capitol Hill and the White House.

When the $18-million renovation is completed, the building will have office space for the National Endowment for the Arts, the National Endowment for the Humanities, the Pennsylvania Avenue Development Corporation, the Advisory Council on Historic Preservation, the National Capital Planning Commission and commercial and cultural tenants.

Designer for the renovation work is the joint venture of McGaughy, Marshal, and McMillan, Arthur Cotton Moore Associates, Associated Space Design Inc., and Stewart Daniel Hoban.

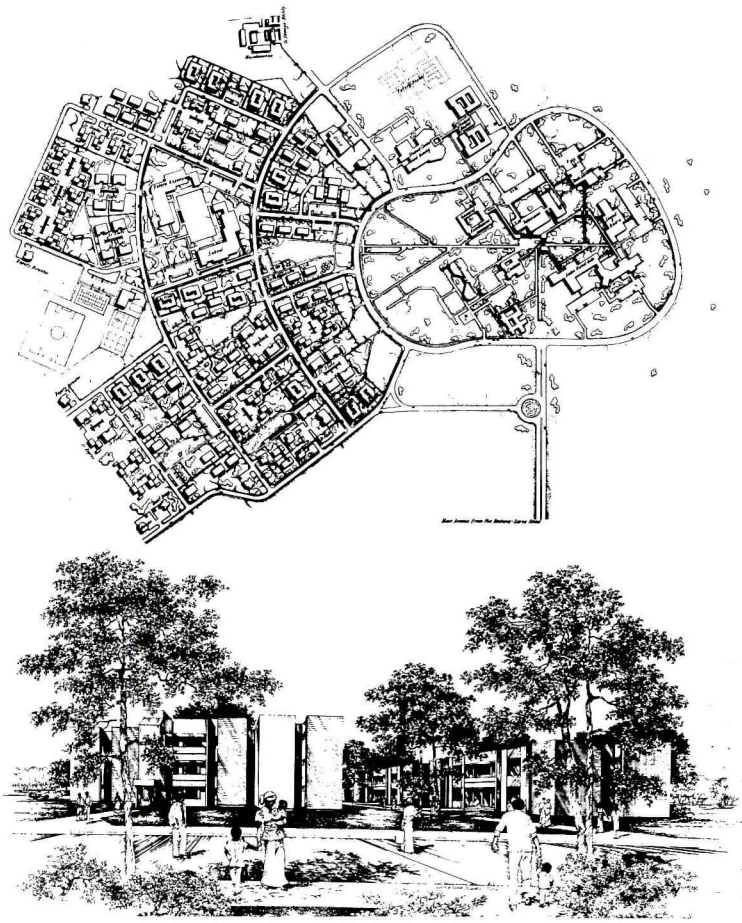
The General Services Administration, which is in charge of the building's renovation, used the dedication as an occasion to reveal some long-forgotten history of the structure's original design:

"It all began in January 1892. Willoughby J. Edbrooke, the supervising architect of the Treasury, presented his sketches to the Secretaries of the Treasury and the Interior and to the Postmaster General for the new post office building. It would take $3.5 million and seven years to complete.

"Edbrooke opposed the use of private architects for Federal buildings, saying that the office of the Supervising Architect built better and less expensive buildings 'than those erected by state and municipal authorities or private parties. . . .

"However, the American Institute of Architects didn't accept Edbrooke's arguments against competition and pursued legislation, which was passed in 1893, to enable the Secretary of the Treasury to hold competitions among architects."

Before that was accomplished, however, the building, based on Edbrooke's design, was started. — *William Hickman, World News, Washington.*



Nigeria builds a suburb for audiovisual production

In Nigeria's semi-arid northern district, the nation's ministry of education will establish a mini-city for the students and staff of the National Educational Technology Center at Kaduna.

The center, with a complex of television, radio and film studios, will serve as a training facility for students in audiovisual communications and as a production facility that will, eventually, furnish all educational audiovisual aids for use in Nigerian schools.

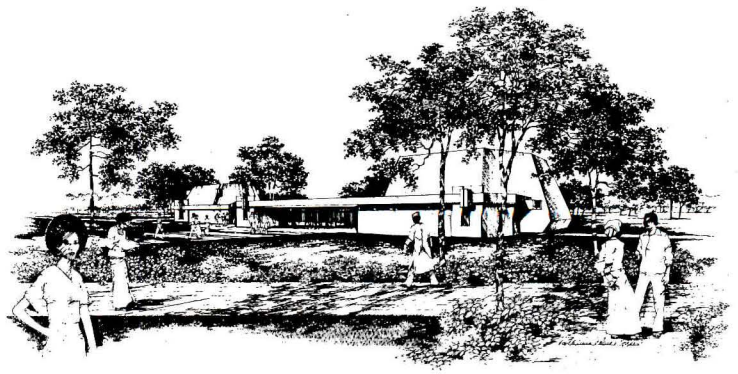
The center will be in effect an independent city located on a 1,000-acre site 10 miles northeast of Kaduna, and will contain its own water treatment facilities, power generation and transportation system. Housing, including student hostels and apartments and single-family houses for the staff and its families, will accommodate an early population of 6,000.

Technical buildings—that is, television, radio and film studios—occupy the heart of the plan, and are circled by a main loop road off of which radiate residential quarters and community services.

In deference to the tropical climate, buildings will be constructed of poured concrete. They will be joined to each other by a network of interconnecting verandas and walkways that will define demographic and architectural areas.

The center will be constructed in three phases. The first phase, for which working drawings have been completed, will include administrative offices and production facilities for television and cinema, as well as roads and services. The cost of the first phase is estimated at 22.5 million naira ($34 million), and its total cost is presently estimated at $90 million.

The master plan and first-phase buildings for the Kaduna center were designed in joint venture by American and Nigerian architectural firms—the Harsen & Johns Partnership of Tenafly, New Jersey, and Niger Consultants.



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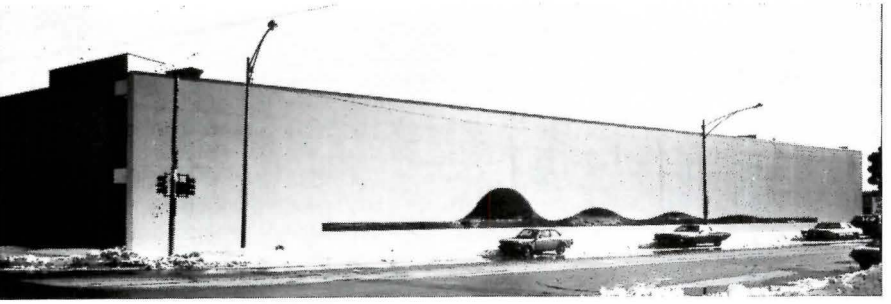
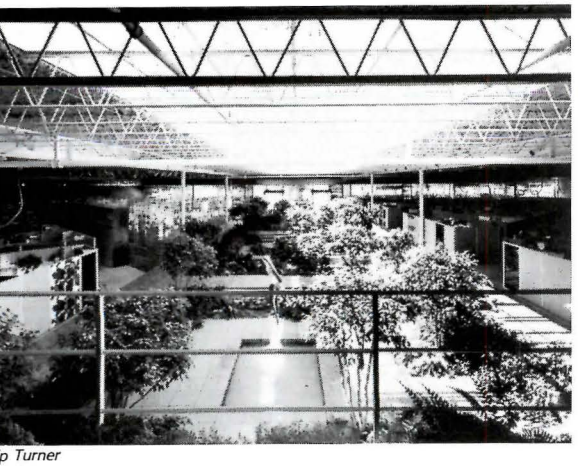
78 Distinguished Buildings program yields a bumper crop of awards for the AIA's Chicago chapter

e Chicago chapter of the nerican Institute of Archi- ts selected a numerous and n collection of projects in its 78 Distinguished Building vards program. Three of the Distinguished Buildings were specially singled out for Honor Awards (shown this page; other awards shown overleaf). Jurors for completed projects included William Caudill, FAIA, of Houston, Hugh Hardy, FAIA, of New York City, and Sarah Harkness, AIA, of Cambridge, Massachusetts. Not-yet-completed designs were judged by Richard Whitaker, Jr., AIA, Dean of Architecture at the University of Illinois Chicago Circle Campus, G. Day Ding, Dean of Architecture at the University of Illinois-Urbana, and R. Ogden Hannaford, Associate Professor of Architecture at the Illinois Institute of Architecture. The Distinguished Buildings were exhibited for five weeks at the Art Institute of Chicago.

nor Award: Illinois Regional rary for the Blind and Physi- y Handicapped, Chicago; nley Tigerman & Associates, architect. "This building advances the art of architecture," the jury declared. "The contrasting colors will be an aid to the visually impaired, the totally blind will find their way more easily because of the defined passage."



nor Award: The Bradford change, Niles, Illinois; Weese egers Hickey Weese Archi- ts Ltd. The jury commented at its members were "greatly impressed by the architect's ability to transform a commonplace strip building into a unique people-oriented office and display space."



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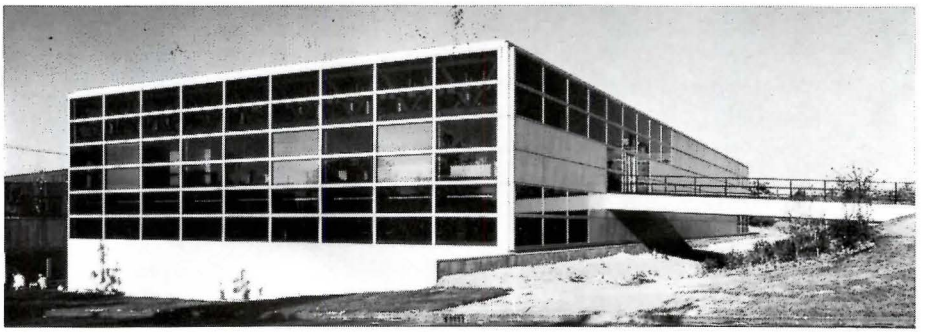
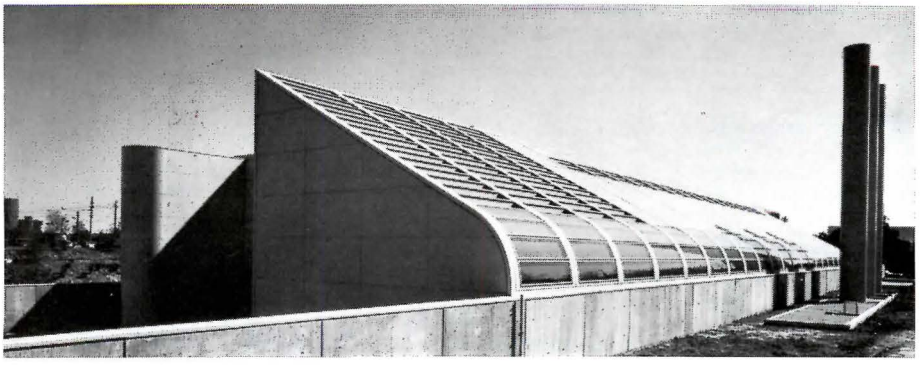
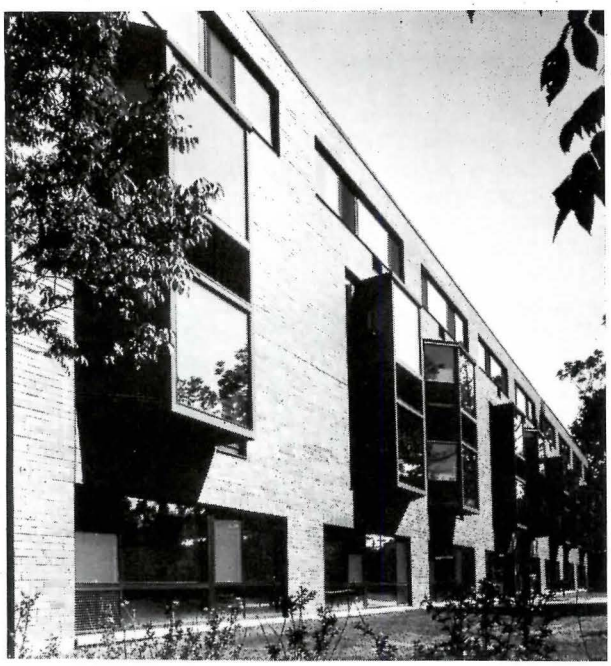




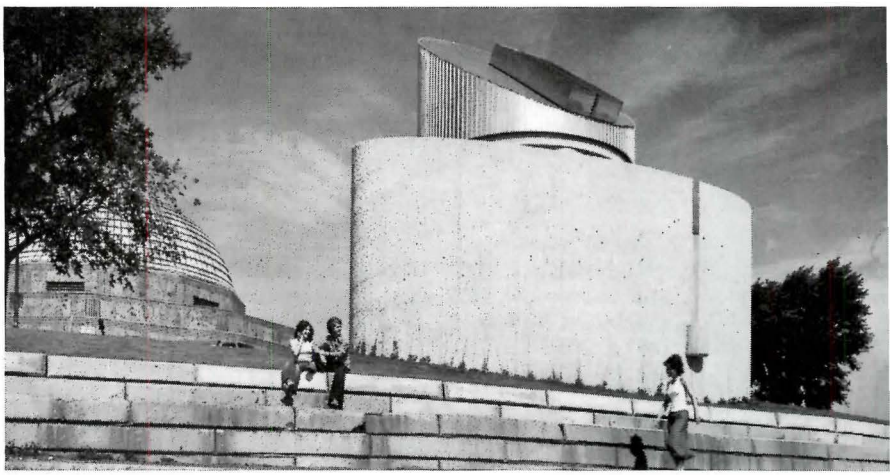
Honor Award: Monsanto Environment Health Laboratory, St. Louis; Holabird & Root, architect. The jury praised "the skillful play of fenestration and massing, [proving] that simple buildings need not be boring. . . . There is a distinct quality about the building—it looks what it does."

Among the Distinguished Buildings, the Chicago jurors selected 15 completed buildings and four not-yet-completed projects

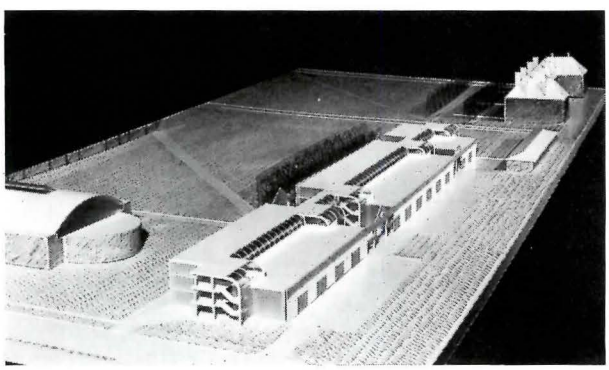
Completed Building: Fire Station #1, Bedford Park, Illinois; Holabird & Root, architect. Said the jury: "The presentation quality is dramatic and strong. It becomes a stage for the fire engines themselves, a simple strong statement."



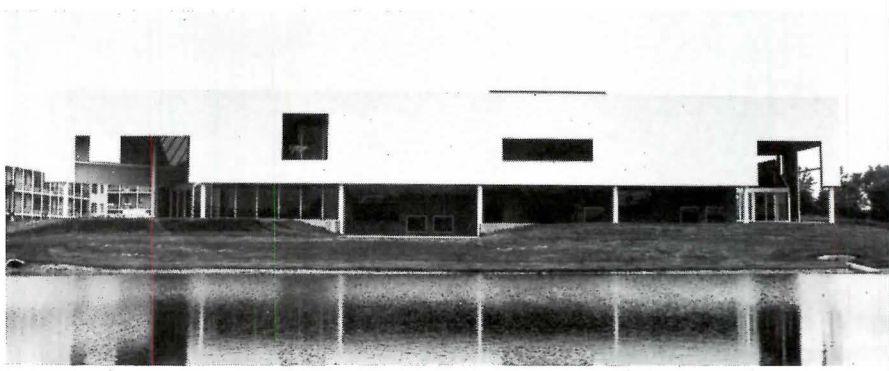
Completed Building: Highland Park Housing for the Elderly, Highland Park, Illinois; Booth, Nagle & Hartray Ltd., architect. "Good residential scale in keeping with its neighbors," said the jury, and added that the housing is "sympathetic to what the life of elderly people ought to be."



Completed Building: The Ralph Doane Observatory of the Adler Planetarium, Chicago; Hammond Beeby and Babka, architect. The jury called the structure, for amateur astro omers, "a direct and unclu tered response to a specialize program," and praised i "strong sculptural quality."



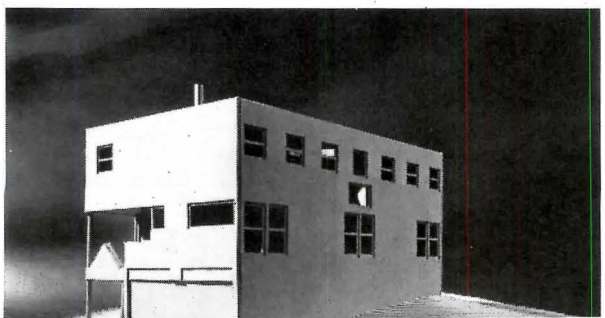
Building Project: Agricultural Engineering Sciences Building, University of Illinois, Urbana-Champaign; C.F. Murphy Associates, architect. The project "integrates whimsically well with Georgian brick buildings," said the jury.



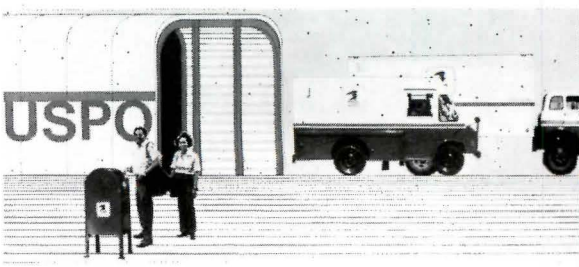
Completed Building: National College of Chiropractic Student Center, Lombard, Illinois; Hinds, Schroeder, Whitaker, architect. The jury admired th use of metal panels and four the design "a playful expre sion of an inert mass."

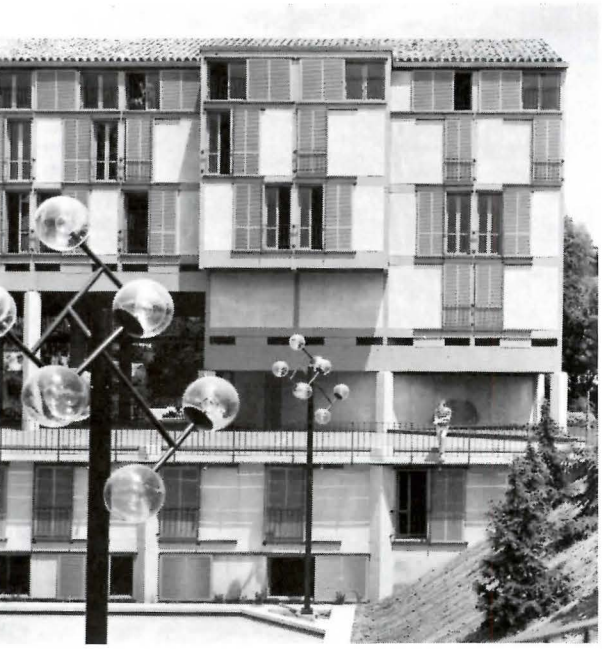
Completed Building: Savior Divine Lutheran Church, Palos Hills, Illinois; Jaeger, Kupritz Ltd., architect. With an "intimate quality," it "sets itself apart from neighbors and yet is not unfriendly."

Building Project: Mackenbach Residence, Itasca, Illinois; Stuart E. Cohen AIA and Sisco/Lubotsky Associates, architects. The jury liked the combination of a simple exterior with "intriguing sculptural spaces in the interior."



Building Project: U.S. Post Office, Oak Brook, Illinois; C. F. Murphy Associates, architect. The jury said, "The conformation of the wall and roof a insulated metal skin does t the 1970s what brownsto did for the 1870s."

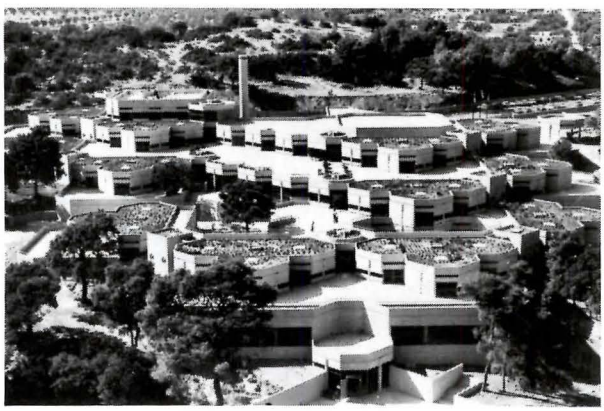




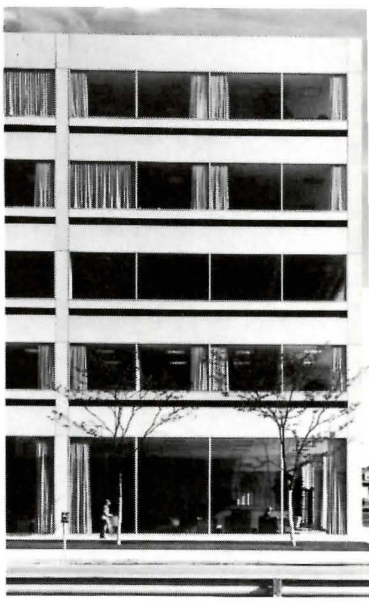
Completed Building: Frederic Emmons Terman Engineering Center, Stanford University, Palo Alto, California; Harry Weese & Associates, architect. "This large building is handled very well," said the jury. "Its character is sympathetic to the region." The design incorporates such traditional Stanford materials as timber framing, stucco and red roofing tiles.

Hedrich-Blessing

Completed Building: Main Post Office, Moraine Valley, Bridgeview, Illinois; Fujikawa Conterato Lohan Associates, architect. The jury found praiseworthy the "skillful use of an inexpensive metal curtain wall. This industrial solution is appropriate to the neighborhood in which it is located."



Completed Building: Bodossakion Demotic School, Athens College, Greece; Perkins & Will International, architect. Finding the school "very impressive," the jury liked the combination of "educational theory with the landscape."

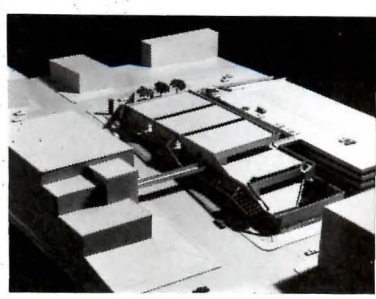


Completed Building: St. Joseph Valley Bank, Elkhart, Indiana; Skidmore, Owings & Merrill, architect. "A classic contemporary office building designed with particular care to the details," said the jury. "It is fresh in its expression."

Completed Building: Academic acility, Rush University, Chicago; Metz Train Olson & Youngren, Inc., architect. The ury termed the medical teaching facility "an up-to-date response to a complex problem. The building is distinctly urban in character [and] has a sculptural quality."

Balthazar Korab

Completed Building: St. John of the Cross Church, Western Springs, Illinois; Loebl Schlossman & Hackl, architect. "A symphony of brick and wood," the jury thought. "The use of materials gives the building warmth." It also commended the "restraint in the avoidance of clichés."



Building Project: Student Community Center, Grand Rapids Junior College, Michigan; WBDC, Inc., Perkins & Will Partnership, Carl Wacker and Associates, architects. "This downtown student center invites pedestrian traffic."

Completed Building: Gymnasium, La Lumiere School, Laporte, Indiana; C. F. Murphy Associates, architect. "The concept of getting ceiling height with a bulldozer is great," the jury thought, and went on to praise a "direct response with economy of means" and the "simplest possible solution to the shelter of an athletic space."

Dodge/Sweet's Construction Outlook: 1979
Moving from a year of expansion into a year of stability

In 1978 the construction industry reached full capacity operation for the first time in five years. But the conditions that supported this recovery no longer exist. Instead, today's environment of worsening inflation, tight money, budgetary restraint, and slowing economic growth indicates that the three-year-long expansion of construction markets is nearing its end. In fact, after adjustment for inflation, the rate of contracting for new projects had just about leveled off by midyear—though at a very high level, to be sure. This change, from expansion to stability, marks the beginning of a sequence of things to come.

As the flow of *new* projects begins to diminish, housing is normally the first of the building markets to weaken. The declining phase of the residential cycle is expected to begin in 1978's closing quarter, while contracting for many types of nonresidential building will still continue to rise through most or all of 1979.

With housing on its way down and many types of nonresidential construction still going up in 1979, the movements of the components of total construction activity will be nearly offsetting. However, the decline of housing—mild as it is expected to be—will tip the balance toward a small (5 per cent) decline in total physical volume of new construction contracted next year. Inflation will boost the price of this reduced volume of new construction to a higher dollar value than 1978's record amount by about 2 per cent.

Although the physical volume of new construction is expected to decline a bit in 1979, what will be happening next year hardly deserves the label of recession. The industry is *not* headed for anything like the 1974/75 collapse. In fact, the final years of the 1970's may prove to be something of a transition period in the evolution of the construction cycle.

For the past 25 years, each new experience with the construction cycle has been more violent than the preceeding one culminating in the most severe cycle of them all—the 1973/78 experience. There is now reason to expect more moderate construction cycles in the future.

A closer examination of building markets shows that most of this cyclicality is concentrated in housing. Not only is the residential market considerably bigger than the nonresidential market, lately it has been showing twice the cyclical excursion from peak to trough that nonresidential building has. Two sources of instability explain most of the extra severity of housing cycles: an undependable supply of mortgage money, and on-and-off government subsidy programs.

Although a slowdown is projected for 1979, it should not approach the recession of '74

"Overheated" was the term widely used to describe conditions in 1973, but in 1978—even after more than three years of expansion—the label does not apply. With capacity utilization currently hovering at 84 per cent (vs. 88) and the unemployment rate stuck at 6 per cent (vs. 4.9) there is enough slack in the system in 1978 to minimize the risk of a boom-and-bust sequence.

What's more, the last recession was greatly intensified by the energy "crisis" of the winter of 1973/74. In the context of business cycles this was a random event (as opposed to those which recur with some regularity), and was instrumental in making the 1974/75 recession the most severe one since the 1930's. While there can be no assurance against another oil embargo sometime in the future, there is no reason to expect it to coincide with the next recession, as the last one did.

What made the 1974/75 breakdown unique was the coincidence of cyclical and non-cyclical forces—the economic/energy episode. But, even if we can assign a low probability to such a rate happening in 1979, there are other vulnerabilities to be concerned about.

One obvious alternative to overheating is cooling off. With less thrust coming from the consumer sector, with government's priorities re-ordered (once again!) from stimulus of growth to restraint of inflation, and with business capital spending at a less-than-optimum rate, further slowing of the economy's pace seems inevitable. But even a slowdown would be preferable to an "induced recession"—the result of excessive monetary restraint as a means of containing inflation. Unless the course of inflation is reversed soon, this risk becomes greater as the economy's growth rate slows.

"Stage II," the Carter Administration's newest effort at reversing inflation's uprising was not made public at the time of printing. It is assumed that some form of voluntary guidelines will be at the core of the program, leaving much of the burden of restraint where it is right now—with the Federal Reserve.

Forecasting the economic environment for 1979 involves two unsatisfactory choices: slowdown and recession. Because a recession brought on by excessive restraint would be, essentially, a policy miscalculation, the slowdown alternative has to be the one to go with. But it should be kept in mind that the Administration and the Federal Reserve will be trying to do what has never been done successfully before—to bring inflation under control by "demand management" without precipitating a recession. There is a great risk in taking the economy to the brink (zero growth by early 1979) and then trying to revive it. The tax cut may be all that makes the difference.

Any market outlook has two critical dimensions: the *direction* that demand is headed, and the level it will attain. For the past three years, the construction industry could safely take the first of these two dimensions for granted. As the building market's cyclical upswing gathered momentum, the key question was not "which way?" but only " how much?". Now, however, as the building cycle approaches its peak, the direction of demand has taken on as much importance as its level.

To highlight the areas of best opportunity in the unstable period ahead, analysis of 1979 construction markets is presented according to four conditions of demand based on both direction and level.

Strong demand and getting stronger: Offices, industrial, sanitation

The best place to look for expansion in the late stages of the construction cycle is the commercial and industrial building sector. Typically the last part of the construction market to participate in a general cyclical advance, contracting for business-related construction finally began to hit stride in 1978—more than a year behind the housing cycle. And even after this year's strong gain, there's room for further expansion in 1979 as

Prepared October 1978 by the Economics Department, McGraw-Hill Information Systems Company; George A. Christie, vice president and chief economist.

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this late upswing continues to develop.

Commercial and industrial building gains are likely to be smaller in 1979 than in 1978, however, and one category—stores and retail warehouses—is already near the peak. Offices and manufacturing buildings are a couple of the construction industry's "best bets" for 1979.

Offices: No construction market has changed over the past couple of years the way this one has. The office building boom of the early 1970's reached its peak in 1973 (just before the REIT bubble burst) leaving a glut of empty office space to haunt the nation's major cities. The problem of excess supply was compounded by the general recession that followed, and by 1975 contracting for new offices had dropped by nearly 50 per cent to just over 100 million square feet.

By early 1978 the condition of surplus office space had become one of shortage. A new boom is now under way as the current rate of building—at the 200 million square feet level—is matching the record output of 1973, but this time with less risk of overreaching demand.

What turned the office building market around so dramatically was the surge of white-collar employment in the middle 70's. Our "demand indicator" says that an annual volume of approximately 200 million square feet for the next two years would be about adequate to accommodate the expected labor force growth which is now at its maximum and will soon begin to grow more slowly. However, experience shows that once a cyclical expansion takes hold, it is characteristic of the office market to overbuild until rising vacancies and weakening rentals reveal—too late—that a surplus exists. Our 1979 estimate allows for a typical amount of cyclical "misadjustment" on the part of office developers.

There are some other significant changes from the recent pattern of office construction. In 1978 the regional distribution of contracting favored the Northeast and the West more than in recent years when the South completely dominated the market. Paralleling this geographical redistribution of demand, there's a shift back toward high-rise buildings and larger projects.

Manufacturing Buildings: Contracting for industrial buildings reveals the fundamental flaw in the economy's lackluster recovery from the 1975 recession: the absence of real strength in business capital spending. The well-established relationship between capacity utilization and industrial construction, which has been a reliable indicator of the demand for building in the past, failed to hold up this time around. Pre-1975 experience shows that by the time plant utilization reaches 84 per cent of capacity (the current rate) a full-scale industrial building boom should be under way. Not so in 1978. Instead of the 240 million square feet of construction previously associated with an 84 per cent utilization rate, current volume is only 200 million—a good gain over 1977, but still some 20 per cent short of potential.

For whatever reasons—and there are more than enough of them: energy constraints, pollution standards, inflation, interest rates, anxiety about wage/price controls, and other issues that are contributing to an unusually high level of business uncertainty—there's been a shift in the relationship between plant utilization and the decision to expand. Since 1975, industry has been playing it a lot closer to the vest (a strategy that is also apparent in lean inventories). This attitude, along with the prospect of diminishing growth of the economy in 1979 limits the potential for further expansion of industrial building next year. Below-normal GNP growth of 2½ per cent will do little to raise the utilization rate, considering that some 200 million square feet of new capacity that was contracted during 1978 will be coming onstream next year. As the rate of plant utilization in manufacturing advances to between 85 and 86 per cent in 1979, the further "tightening" of operations is expected to call forth another 220 million square feet of new manufacturing building—20 million more than in 1978, but still a low volume by pre-1975 standards.

Sewer and Waste Treatment Facilities: For reasons having nothing to do with the construction cycle, sewer and water facilities have been, and continue to be, one of the construction industry's best growth markets. The key to above-average growth in sewer/waste treatment projects is the continuing support from the Federal trust fund established to meet long-term national goals for water purity. The EPA fund (originally $18 billion, and recently supplemented by another $24 billion) has reasonably well insulated this construction market from severe cyclical

1979 National Estimates

Dodge Construction Potentials

Nonresidential Buildings		1977 Actual	1978 Preliminary*	1979 Forecast	Percent Change 1979/78
Contract Value (millions of dollars)	Office Buildings	$ 5,247	$ 8,500	$ 9,850	+16
	Stores & Other Commercial	8,343	10,700	10,400	− 3
	Manufacturing Buildings	5,150	7,800	7,800	—
	Total Commercial & Manufacturing	$18,740	$27,000	$28,050	+ 4
	Educational	$ 5,217	$ 5,600	$ 5,800	+ 4
	Hospital & Health	4,485	4,150	4,200	+ 1
	Other Nonresidential Buildings	6,857	5,950	6,750	+13
	Total Institutional & Other	$16,559	$15,700	$16,750	+ 7
	Total Nonresidential Buildings	$35,299	$42,700	$44,800	+ 5
Floor Area (millions of square feet)	Office Buildings	137	200	215	+ 8
	Stores & Other Commercial	430	525	475	−10
	Manufacturing Buildings	171	200	220	+10
	Total Commercial & Manufacturing	738	925	910	− 2
	Educational	112	103	100	− 3
	Hospital & Health	67	60	58	− 3
	Other Nonresidential Buildings	184	157	170	+ 8
	Total Institutional & Other	363	320	328	+ 2
	Total Nonresidential Buildings	1,101	1,245	1,238	− 1

*Eight months actual; four months estimated.

Residential Buildings		1977 Actual	1978 Preliminary*	1979 Forecast	Percent Change 1979/78
Contract Value (millions of dollars)	One-Family Houses	$ 49,508	$ 54,550	$ 51,300	− 6
	Multifamily Housing	10,652	13,250	15,000	+13
	Nonhousekeeping Residential	1,273	1,700	2,000	+18
	Total Residential Buildings	$ 61,433	$ 69,500	$ 68,300	− 2
Floor Area (millions of square feet)	One-Family Houses	1,910	2,045	1,815	−11
	Multifamily Housing	472	535	560	+ 5
	Nonhousekeeping Residential	36	45	50	+11
	Total Residential Buildings	2,418	2,625	2,425	− 8
Dwelling Units (thousands of units)**	One-Family Houses	1,343	1,320	1,135	−14
	Multifamily Housing	506	555	590	+ 6
	Total Housekeeping Residential	1,849	1,875	1,725	− 8

Nonbuilding Construction					
Contract Value (millions of dollars)	Highways & Bridges	$ 10,210	$ 10,200	$ 10,000	− 2
	Utilities	20,275	15,000	18,000	+20
	Sewer & Water	7,123	8,400	9,100	+ 8
	Other Nonbuilding Construction	4,873	6,200	5,600	−10
	Total Nonbuilding Construction	$ 42,481	$ 39,800	$ 42,700	+ 7

All Construction					
Contract Value (millions of dollars)	**Total Construction**	$139,213	$152,000	$155,800	+ 2
	Dodge Index (1972 = 100)	153	167	171	

*Eight months actual; four months estimated.
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Since 1970—the benchmark year when the National Environmental Policy Act established the Federal program of goals and subsidies—sewer/waste treatment construction has shown annual growth averaging 13 per cent in dollar terms, and better than 4 per cent after adjustment for inflation. This *real* rate of growth in the 1970's has been double that of construction activity as a whole.

Circumstances point to a below-average gain in sewer/waste treatment contracting in 1979. There will, of course, be a gap in funding due to the expiration of the LPWA program. This gap will amount to roughly half a billion dollars—the portion of 1978's total that is traceable to Round II. In addition, a recent change in the manner of releasing EPA disbursements will slow future growth. By shifting to the concept of "level funding" (i.e., equal annual installments of $4.5 billion through 1984) the agency hopes to minimize inflationary pressures. It is not expected, however, that the "Proposition 13 effect" will be much of a deterrent to sewer and waste treatment facilities construction at the local level since local dollars have very high leverage when used in combination with Federal funds.

Currently strong, but likely to weaken: single-family homes, stores, warehouses

The types of construction found in this group are the ones which have been some of 1978's best performers: single-family housing, stores and warehouses (which derives from homebuilding), and roadbuilding.

Because these markets will be easing from very high levels of demand, good volume is still indicated for 1979. Sensitivity to the timing of cyclical turning points will be important, however.

One-Family Housing: How much longer can the amazing homebuilding market stand up under the combined pressures of mind-blowing price tags and double-digit mortgage rates? As these two signs of stress imply, the answer can only be found in an assessment of the underlying strength of the demand for housing and the financial resources to make that demand effective.

The *quantity* of housing currently being produced (mid-1978) appears to be in good balance with the underlying demographic trends that determine the need for shelter. The rate of household formation and the replacement of losses to the stock of housing in the second half of the 1970's indicate a basic annual need for shelter averaging about 2.3 million new units. With 300,000 units of this need being met by mobile homes, the current two million unit rate of conventional housing starts (both one-family and multi-family units) ought to be sustainable as long as it remains affordable.

The housing market has already had its initial encounter with monetary restraint, and it came through surprisingly well. When Treasury bill rates soared above the ceilings on savings deposits at thrift institutions last spring, the homebuilding industry braced for another round of disintermediation that would send housing activity tumbling in 1978's second half. But it didn't happen. However, the housing market will be under maximum financial stress between now and spring. During this critical period, the rate of one-family housing starts will decline to a 1,100,000 annual rate, then gradually recover to a 1,250,000 annual rate by year-end for a total of 1,175,000 units for the year.

Retail Building: The well-established statistical relationship between housing starts and contracting for stores/shopping centers bears out what logic suggests: that the demand for retail facilities is derived principally from homebuilding and that the lag between the two is quite short (about six months, on average). Now that the driving force—homebuilding—has leveled off and is expected to decline in the months ahead, the prospect for continuation of the three-year expansion of retail building is limited.

Another indication of the critical state of retail building market is the present high ratio of warehouse to store building. This ratio is typically at its lowest, around 60 square feet of warehouse to every 100 square feet of store, at the bottom of the building cycle, rising steadily to a maximum of 0.9 to 1 at the peak. What this means is that during early recovery, when business is picking up, retail construction is concentrated where the profit is—in selling, not warehousing. But eventually, as business improves, warehousing must be expanded to match the higher sales volume. By mid-1978 contracting for warehouses was almost matching stores square foot for square foot, beyond the ratio that is characteristic of the cyclical peak.

The signs clearly point to a diminished

1979 Regional Estimates

Dodge Construction Potentials

Northeast

Connecticut, District of Columbia, Delaware, Massachusetts, Maryland, Maine, New Hampshire, New Jersey, New York, Eastern Pennsylvania, Rhode Island, Virginia, Vermont

Contract Value (millions of dollars)

	1977 Actual	1978 Preliminary*	1979 Forecast	Percent Change 1979/78
Nonresidential Buildings				
Commercial & Manufacturing	$ 2,833	$ 4,050	$ 4,225	+ 4
Institutional & Other	3,468	3,200	3,525	+10
Total	$ 6,301	$ 7,250	$ 7,750	+ 7
Residential Buildings				
One-Family Houses	$ 6,543	$ 6,825	$ 6,675	− 2
Multifamily Housing	1,643	2,250	2,700	+20
Nonhousekeeping Residential	216	350	400	+14
Total	$ 8,402	$ 9,425	$ 9,775	+ 4
Nonbuilding Construction				
Highways & Bridges	$ 2,075	$ 1,950	$ 2,000	+ 3
Utilities	3,362	3,000	2,500	−17
Other Nonbuilding Construction	3,211	3,800	3,800	—
Total	$ 8,648	$ 8,750	$ 8,300	− 5
Total Construction	$23,351	$25,425	$25,825	+ 2

Midwest

Northern Illinois, Indiana, Iowa, Kentucky, Michigan, Minnesota, North Dakota, Ohio, Western Pennsylvania, South Dakota, Wisconsin, West Virginia

Contract Value (millions of dollars)

Nonresidential Buildings				
Commercial & Manufacturing	$ 4,759	$ 6,350	$ 6,725	+ 6
Institutional & Other	4,420	4,100	4,350	+ 6
Total	$ 9,179	$10,450	$11,075	+ 6
Residential Buildings				
One-Family Houses	$11,667	$12,550	$12,050	− 4
Multifamily Housing	2,608	2,925	3,450	+18
Nonhousekeeping Residential	276	350	400	+14
Total	$14,551	$15,825	$15,900	—
Nonbuilding Construction				
Highways & Bridges	$ 2,578	$ 2,750	$ 2,600	− 5
Utilities	3,799	5,500	5,200	− 5
Other Nonbuilding Construction	2,720	4,200	4,000	− 5
Total	$ 9,097	$12,450	$11,800	− 5
Total Construction	$32,827	$38,725	$38,775	—

*Eight months actual; four months estimated.

South

Alabama, Arkansas, Florida, Georgia, Southern Illinois, Kansas, Louisiana, Mississippi, Missouri, North Carolina, Nebraska, Oklahoma, South Carolina, Tennessee, Texas

Contract Value (millions of dollars)

	1977 Actual	1978 Preliminary*	1979 Forecast	Percent Change 1979/78
Nonresidential Buildings				
Commercial & Manufacturing	$ 6,758	$10,275	$10,275	—
Institutional & Other	5,356	5,025	5,350	+ 6
Total	$12,114	$15,300	$15,625	+ 2
Residential Buildings				
One-Family Houses	$18,055	$21,275	$19,500	− 8
Multifamily Housing	2,965	4,100	4,575	+12
Nonhousekeeping Residential	312	550	600	+ 9
Total	$21,332	$25,925	$24,675	− 5
Nonbuilding Construction				
Highways & Bridges	$ 3,788	$ 3,725	$ 3,700	− 1
Utilities	10,944	5,000	6,800	+36
Other Nonbuilding Construction	3,748	4,000	4,100	+ 2
Total	$18,480	$12,725	$14,600	+15
Total Construction	$51,926	$53,950	$54,900	+ 2

West

Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming

Contract Value (millions of dollars)

Nonresidential Buildings				
Commercial & Manufacturing	$ 4,390	$ 6,325	$ 6,825	+ 8
Institutional & Other	3,315	3,375	3,525	+ 4
Total	$ 7,705	$ 9,700	$10,350	+ 7
Residential Buildings				
One-Family Houses	$13,243	$13,900	$13,075	− 6
Multifamily Housing	3,436	3,975	4,275	+ 8
Nonhousekeeping Residential	469	450	600	+33
Total	$17,148	$18,325	$17,950	− 2
Nonbuilding Construction				
Highways & Bridges	$ 1,769	$ 1,775	$ 1,700	− 4
Utilities	2,170	1,500	3,500	++
Other Nonbuilding Construction	2,317	2,600	2,800	+ 8
Total	$ 6,256	$ 5,875	$ 8,000	+36
Total Construction	$31,109	$33,900	$36,300	+ 7

*Eight months actual; four months estimated.

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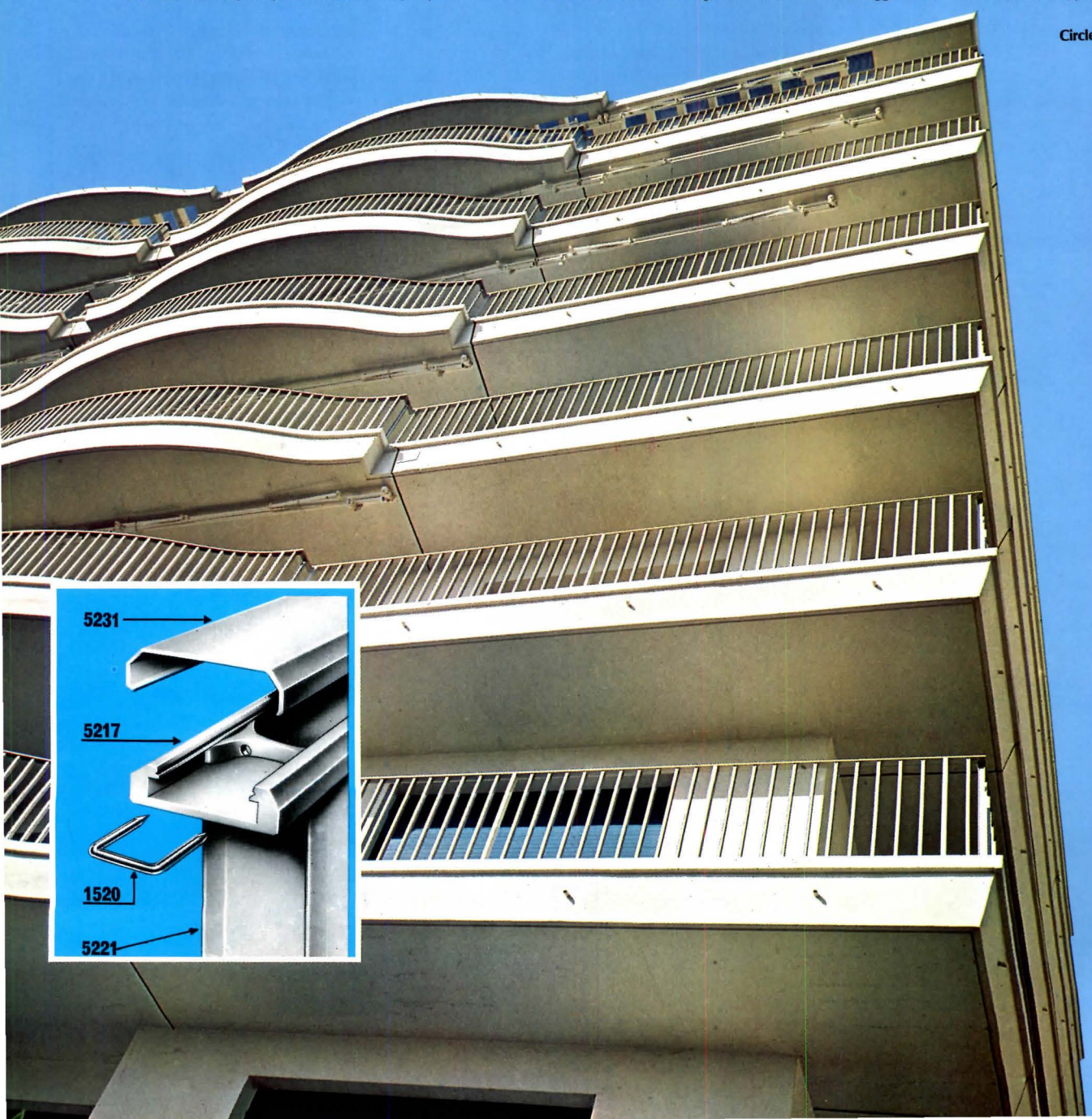

volume of retail building in 1979. However, because store building did not quite keep pace with the housing boom through late 1977 and early 1978, and because the impending setback for homebuilding is expected to be relatively shallow and brief, next year's decline of retail building is likely to be a small one, with weakness concentrated in the second half of the year.

Streets, Highways, and Bridges: Roadbuilding, like sewer and waste treatment facilities, participated heavily in the $6 billion Local Public Works Act during 1977 and 1978. For roadbuilding, the maximum impact of the program was felt between mid-1977 and mid-1978 when the rate of contracting was boosted nearly 25 per cent above normal. As a result, both 1977 and 1978 were unusually strong years for highway work with a record $10-plus billion of construction contracted in each year. By 1978's second half, however, LPWA funding was depleted and contracting was settling back into its familiar trend which is governed mostly by disbursements from the Federal Highway Trust Fund.

The generous provisions of the proposed Surface Transportation Act are bound to escalate spending for highways, bridges, and related construction over the years ahead. However, it is expected that budgetary restraint and concern over inflation will prevail in the short run, holding 1979 contracting at or slightly below 1978's unusually high total.

Below potential with prospect of gain: multi-family housing, public administration

Even in booming 1978, at the peak of the building cycle, a few construction markets are not living up to their potential. Because special circumstances apply in each case, multi-family housing, electric utilities, and public administration buildings have little in common except the opportunity for improvement in 1979.

Multi-Family Housing: After three years of recovery, contracting for multi-family housing is leveling off at close to 600,000 units annually—only a little more than half the volume of the early 1970's when the apartment market was at its peak. With housing demand generally strong in 1978, and with one-family demand currently well ahead of its former cyclical high, there obviously have been some major changes in the apartment market between 1973 and 1978.

Demography explains most of the change. As noted earlier, the closer we get to the 1980's, the more the age mix of the population favors home ownership. The young adults of the late 1960's and early 1970's, who at that time provided the rationale for peak multi-family building, are now making the transition from apartments to one-family homes in large numbers. Inflation also has a lot to do with the reduced volume of apartment building. Over the past five years, development and operating costs (land, construction, money, and energy) have all been rising faster than rentals in most areas, making apartment development only marginally profitable without some form of subsidy. (This is the other side of the cost/income relationship that has been making ownership so advantageous.)

As the multi-family building market continues to adapt to the structural changes of the mid-1970's, an average volume of about 600,000 per year (the current rate of building) will be appropriate for the next five years or more. However, in 1979 there is the potential for a modest but temporary expansion beyond that average level. Currently low vacancy rates—particularly in the West and in the Northeast—and the rapid absorption of newly-built units are indications of a supply/demand imbalance carried over from an insufficient volume in 1975 and 1976.

With credit conditions working against expansion of conventionally-financed multi-family building in the near future, the potential for gain in 1979 is limited to the area of low-and middle-income subsidized units—HUD's domain—which presently (along with FMHA) involves one-quarter of total multi-family starts.

After a period of very low activity (1974-75), Federal housing subsidy programs are again on the rise. In 1978, starts of new multi-family units under the government's many and varied programs (but mostly through Section 8) will total about 150,000—up from less than 100,000 two years earlier. With the Carter Administration's commitment to urban redevelopment as its mandate, HUD is requesting a substantial increase in subsidized multi-family housing starts in 1979.

Utilities: For the first time since the 1973/74 energy crisis, contracting for electric power plants is headed for a decline in 1978—and a sizeable one at that.

The spectacular expansion of generating capacity in the 1970's carried last year's contract value for new utility construction to a record $20 billion (more than the equivalent of all the commercial and industrial building contracted that year). But with only $11 billion of new projects reported through the first eight months of 1978, it appears that this year's total will be off by as much as $5 billion.

The main difference in 1978 is not the *number* of new projects, but their size and type. This year new power plants are averaging less than $500 million each—barely half last year's amount. The decline is due to a major shift from nuclear to fossil fuel.

Short of a major technological breakthrough (or another crisis), it would appear that the electric utilities will continue to go the fossil fuel route for the time being. As long as they do, it means a lower growth trend of expenditures for electric power plants than the one that has prevailed for the past five years.

Public Administration Buildings: Ever since Revenue Sharing began transferring $6 billion of Federal taxes each year to local governments, contracting for public administration buildings has settled into a relatively steady groove, averaging 45 million square feet per year. This stability was temporarily disturbed late in 1977 when the Local Public Works Act dropped three quarters of a billion dollars into this relatively small building market. For a brief time the rate of contracting more than doubled, and then as soon as the special funds were gone, activity plummeted. By now the effect has mostly dissipated, leaving 1977 abnormally high, and 1978 abnormally low.

Weak in '78; declining further in '79: schools and hospitals

With only a couple of temporary interruptions, the path of contracting for institutional buildings has been downward for the past 10 years. Since 1968, when contracting hit a peak of 481 million square feet of new construction, the institutional building market has shrunk by one-third to its present 315 million square feet. And over this decade of decline the condition has spread from schools (declining enrollments) to hospitals (excess capacity and inflation).

There's one important feature of this market that must not be overlooked, however. As the demand for *new* construction has declined, the volume of additions, alterations, and rehabilitation of existing institutional buildings has been increasing sharply. Nearly half the educational construction currently being done, and more than half the hospital work, involves the modification of existing structures.

Educational Buildings: The steady decline of school enrollments during the 1970's has reduced the need for building new classrooms and other educational facilities to a fraction of what it was at the end of the 1960's. Relocation of the population (not enrollments) is now the main source of demand for educational building, as evidenced by the disproportionate share of construction that is concentrated in the South. Prior to the Sunbelt migration of the early and mid-1970's, the South built 25 per cent of the national total of schools; by 1975 that ratio had risen to 33 per cent; currently it is 42 per cent.

With migration now slowing from the extraordinary inter-regional movement of the mid-70's, even some of the support for educational building that has been based on relocation will be diminishing in the years immediately ahead, and the outlook is for a further decline to a new low of 100 million square feet.

Hospitals and Health Facilities: In sharp contrast to the 1960's, when expansion of hospital construction was being encouraged by Federal subsidy programs, the 1970's brought government regulation and restraint over the further development of health facilities. What turned this building market around was the combination of excess capacity and rampant inflation in health care delivery systems. Tight control over building, and greater emphasis on more efficient use of existing facilities will prevail until the current excesses are worked out. The 1979 outlook is a decline from 1978's total of 60 million square feet to 55 million—the lowest volume since the early 1960's. Stability in the range of 55 to 60 million square feet annually is the prospect for the next several years.

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Proprietorship, partnership, corporation? Weighing the alternatives.

In recent years, many professionals have considered incorporating their practices. Following examples set by doctors, lawyers and accountants, architects also have questioned whether the traditional sole proprietorship or partnership form of practice remains viable in light of changing business practices, tax laws, statutory developments, and liability concerns. With the passage of time, it has become clear that numerous unrelated factors must be considered carefully before an architect can decide which legal format is most appropriate for his practice. None of the four basic forms—the sole proprietorship, the partnership, the professional corporation, or the general business corporation—can be a perfect solution for every firm under all circumstances. The pros and cons of each must be carefully weighed.

by Arthur T. Kornblut, Esq.

The initial selection of a legal format for an architectural practice is rarely the result of a careful analysis of management, legal, insurance and tax factors that can affect an architect's business as it develops. Rather, during the start-up phase of a practice, architects often operate as sole proprietors or in partnership because these legal formats require few formalities to come into existence. They even can become the legal vehicle for the practice by default (i.e. in the absence of a stated plan to operate as a proprietorship or a partnership, this intent can be inferred by the lines along which the practice actually has developed). And even when there is specific intent to operate in one of these forms, little may be done to formalize, by means of written partnership agreements or other documents, the intentions of the principals.

The need for written documentation of the principals' intentions about the conduct of the practice should not be underestimated. For example, a major problem in dissolving a partnership often is the absence of a written agreement or one without adequate provisions to cover the distribution of assets (such as pending professional service contracts) and liabilities upon termination. If dissolution occurs, it can be anticipated that full cooperation among the partners will not be possible at that time, whether the break-up is caused by death, disability, or fundamental disagreements. As long as the partnership remains viable, almost any problem can be handled by contemporaneous discussion and agreement, and thus the need for a written agreement sometimes becomes obscured when the partners become accustomed to operating without one.

There probably is little long-term danger in not having a firm plan for the legal structure of the practice when it commences. Architects should be able to rely on the ease with which proprietorships and partnerships can come into existence and be conducted. They afford significant flexibility in management to enable the firm to grow along lines best suited for the people and type of practice involved, and they are particularly amenable to change, both within their own formats or to another one.

As the practice develops, it may become desirable to evaluate the initial legal format to see whether it continues to serve the needs of the firm in light of changing circumstances. Analysis may reveal that continued use of a proprietorship or partnership will be in the firm's best interest. Or, it may indicate that establishing a corporation would be more appropriate. This decision can not be made in the abstract. It requires a full review of all known factors affecting the professional practice. Business goals and priorities must be established by the principals. From this review, the specific items that are most important to the principals often will determine the optimum legal format. Because of the expense, time, paperwork and numerous legal details involved, any decision to change can not be made lightly. If the decision proves wrong and another change is mandated within a relatively short period, it will be disruptive and costly to the practice.

From time to time, this column will cover specific aspects of the impact of an architectural firm's legal format on various factors affecting the professional practice. This month's column will commence with a brief review of some effects of the legal format on a multi-state practice. Future topics being considered are tax considerations; professional liability concerns; broadening and transfer of management and ownership; and combining the professional practice with non-architectural, but related, business activities.

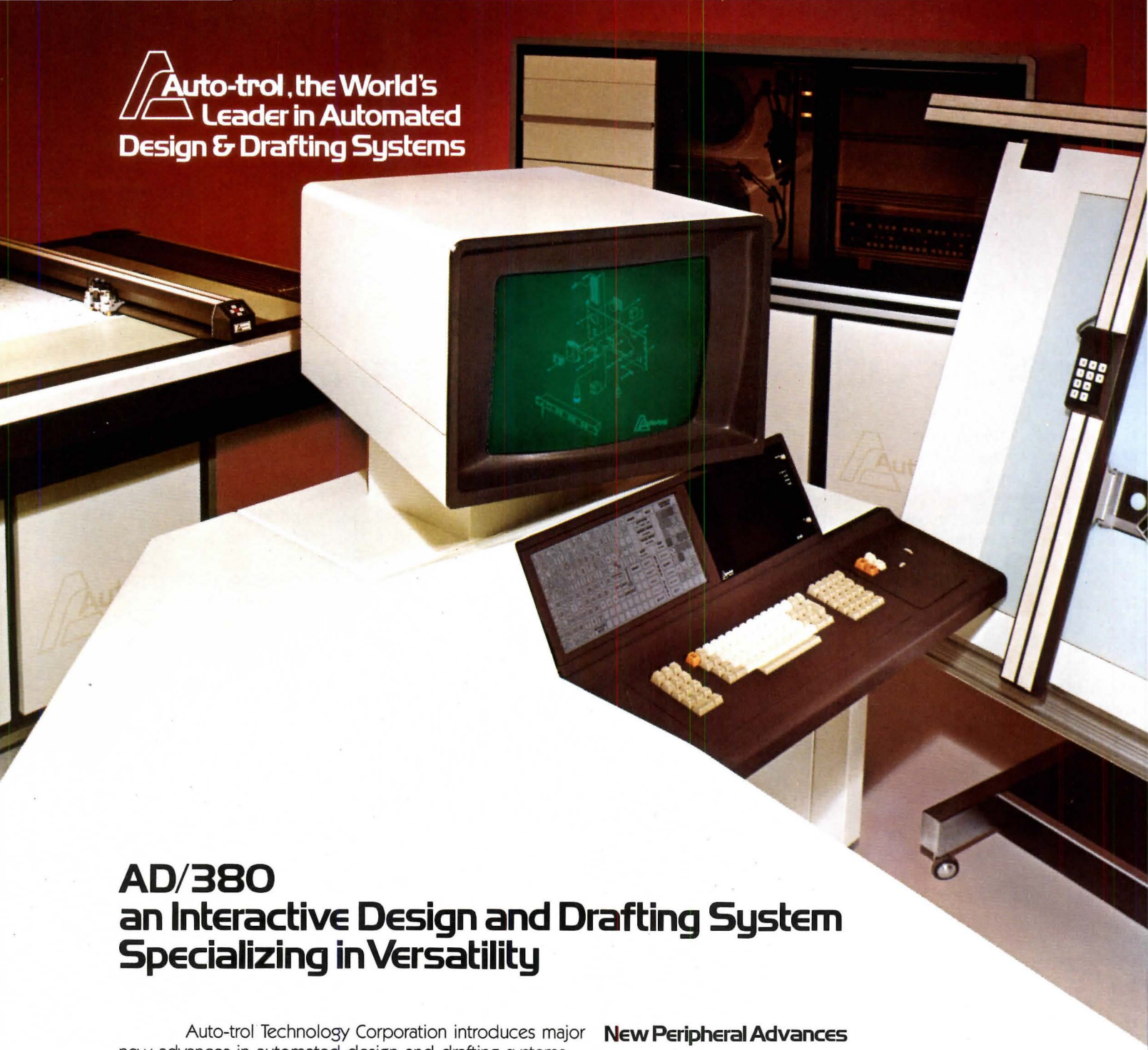
The impact of interstate practice

All other considerations aside, an architectural firm with a multi-state practice often is better off operating as a sole proprietorship or a partnership. Many professional registration laws and regulations were formulated when professionals could not incorporate, and their requirements are decidedly slanted toward non-corporate forms of practice. This is changing somewhat as more states enact modernized registration statutes compatible with relatively recent professional corporation laws.

In additon to professional registration law requirements, corporations operating in foreign jurisdictions (ones other than the state in which incorporated) often have to comply with specific laws related to authorizations for out-of-state corporations to engage in business locally. For a sole proprietor or partnership, the major requirements may only be that at least one principal hold a valid professional license to practice in the jurisdiction.

The importance of being properly qualified to both practice and do business in a given state can not be overemphasized. If these requirements are not met, a firm may not be able to sue successfully for the collection of fees. New Jersey is one state that is notably strict in this regard. In a recent case, an A/E firm organized as a Maryland corporation entered into a contract with a New Jersey client for a project located in New Jersey. An employee of the firm held a valid New Jersey architect's license and signed and sealed the drawings. When the client failed to pay the fees for professional services, the A/E firm sued on the contract in Federal court in New Jersey. The court, interpreting New Jersey law, found the contract to be illegal, denied the A/E recovery, and stated that the corporation was not authorized by the state licensing law to perform professional services in New Jersey. Even though a New Jersey registered architect-employee signed and sealed the documents, he was not a party to the contract at issue and had no right to sue for breach of it.

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



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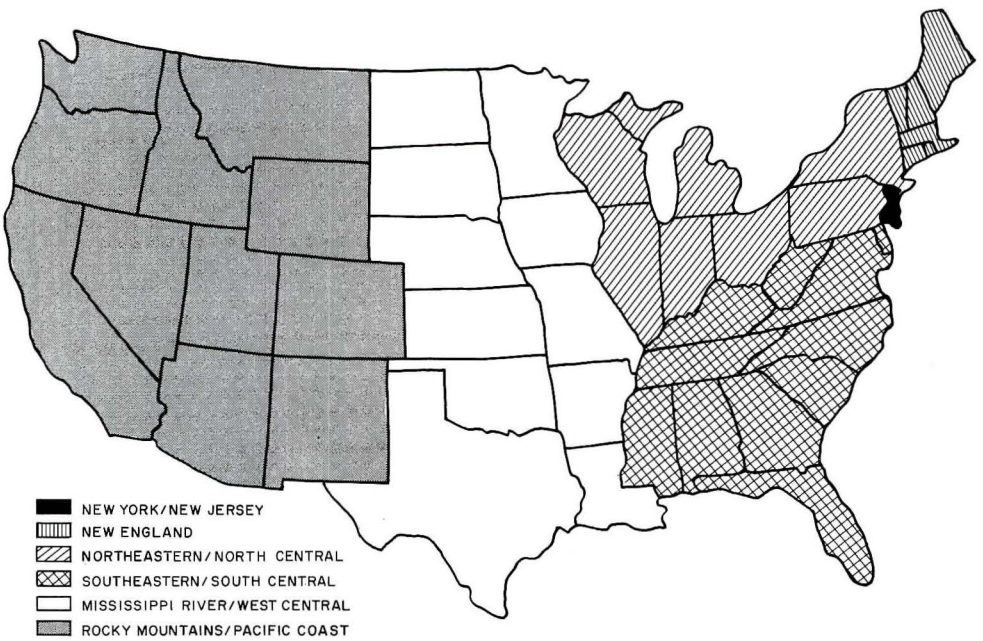
U.S. construction costs have increased 6.8 per cent in one year

Based on a recent survey of the prices of five key building materials, and wage rates for ten widely used building trades, average building construction costs have increased 3.5 per cent in the past six months, and now stand 6.8 per cent above this time a year ago.

According to the Dodge Building Cost Services' report, on the average, 183 metropolitan areas throughout the United States showed building material prices increased 5.9 per cent in the last 12 months, while hourly wage rates of building trade craftsmen increased 8.2 per cent for the year. Building costs in Canada have increased 9.6 per cent above a year ago.

In developing this index, data are weighted to reflect the impact of basic cost components on the over-all cost of a "typical" building that is really a composite of residential, non-residential, and institutional buildings.

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

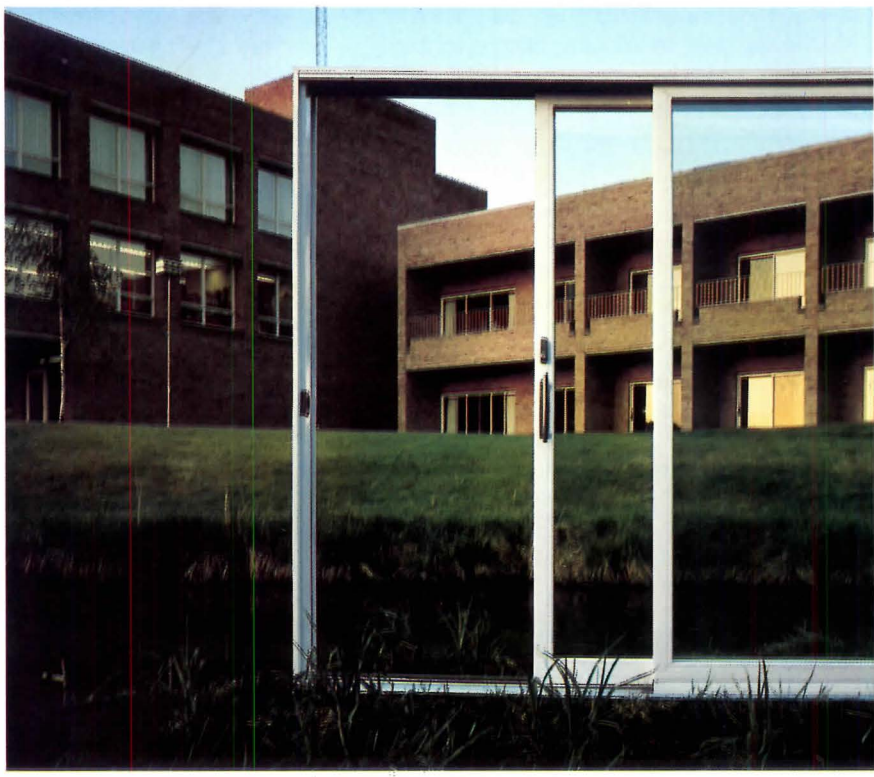


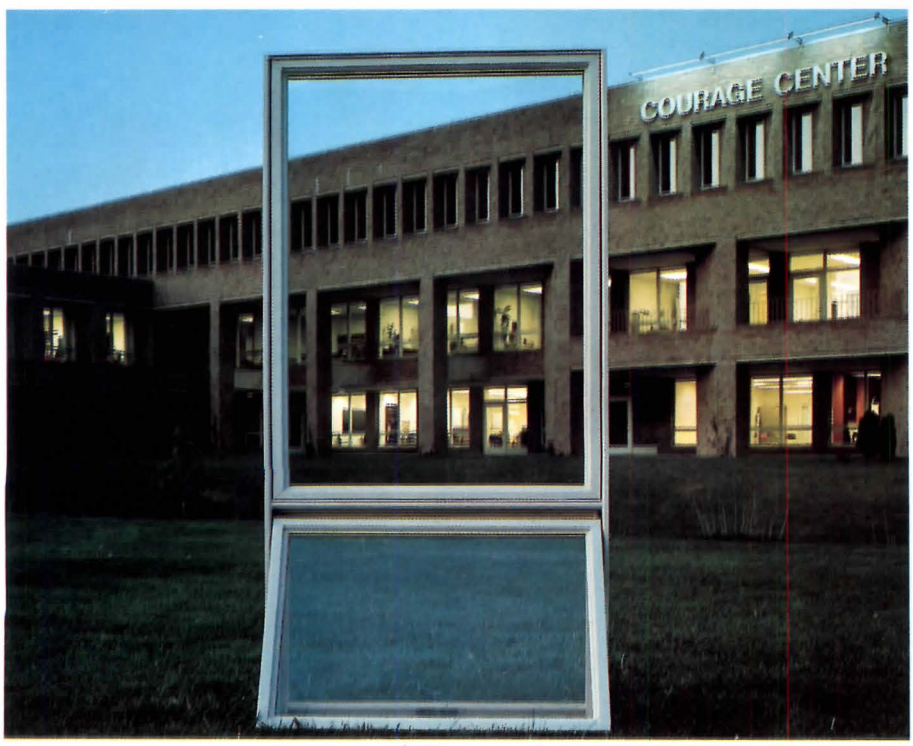
HISTORICAL BUILDING COST INDEXES—AVERAGE OF ALL NON-RESIDENTIAL BUILDING TYPES, 21 CITIES

1941 average for each city = 100.00

Metropolitan area	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977 (Quarterly) 1st	2nd	3rd	4th	1978 (Quarterly) 1st	2nd	3rd	4th
Atlanta	353.1	384.0	422.4	459.2	497.7	544.8	575.0	598.7	657.1	701.5	712.0	704.3	732.5	742.8	772.5	789.6	
Baltimore	308.7	322.8	348.8	381.7	420.4	475.5	534.3	581.1	585.0	605.7	614.8	628.1	653.2	661.0	687.4	687.4	
Birmingham	284.3	303.4	309.3	331.6	358.3	402.1	421.2	448.9	551.9	543.8	551.9	575.9	598.9	608.5	632.8	626.7	
Boston	277.1	295.0	328.6	362.0	394.4	437.8	462.5	513.2	555.9	567.7	576.2	581.3	604.5	611.1	635.5	621.5	
Chicago	339.5	356.1	386.1	418.8	444.3	508.6	529.6	560.1	635.2	662.2	672.1	683.4	710.7	717.8	746.5	747.9	
Cincinnati	302.6	325.8	348.5	386.1	410.7	462.4	500.1	550.6	609.8	615.6	624.8	650.7	676.7	683.5	710.8	710.8	
Cleveland	331.5	358.3	380.1	415.6	429.3	462.2	509.5	531.0	632.9	619.4	628.7	615.1	639.7	650.6	676.6	670.1	
Dallas	281.7	308.6	327.1	357.9	386.6	436.4	477.9	499.6	538.5	560.1	568.5	611.6	636.1	640.6	666.2	716.8	
Denver	312.5	339.0	368.1	392.9	415.4	461.0	510.0	553.6	616.0	656.3	666.1	691.7	719.3	731.5	760.8	760.8	
Detroit	316.4	352.9	377.4	409.7	433.1	501.0	538.7	597.5	617.2	634.2	643.7	649.4	675.3	733.7	763.0	755.7	
Kansas City	278.0	295.5	315.3	344.7	367.0	405.8	444.9	509.1	547.3	568.2	576.7	592.1	615.7	625.6	650.6	661.9	
Los Angeles	320.1	344.1	361.9	400.9	424.5	504.2	531.8	594.1	673.1	709.2	719.8	748.2	778.1	787.4	818.9	836.0	
Miami	305.3	392.3	353.2	384.7	406.4	447.2	485.5	558.9	592.5	604.6	613.7	616.7	641.3	653.5	679.6	673.1	
Minneapolis	309.4	331.2	361.1	417.1	412.9	456.1	488.6	538.0	564.1	593.0	601.9	617.9	642.6	654.8	680.9	658.0	
New Orleans	274.2	297.5	318.9	341 8	369.7	420.5	442.1	494.7	534.8	580.2	588.9	609.2	633.5	639.8	665.4	665.4	
New York	321.4	344.5	366.0	395.6	423.1	485.3	515.3	533.5	580.8	607.7	616.8	607.7	632.0	644.6	670.4	650.0	
Philadelphia	301.7	321.0	346.5	374.9	419.5	485.1	518.5	567.5	579.2	615.8	625.0	655.8	682.0	688.8	716.4	709.5	
Pittsburgh	293.8	311.0	327.2	362.1	380.3	424.4	465.6	509.5	526.3	549.5	557.7	579.7	602.9	615.2	639.8	618.3	
St. Louis	304.4	324.7	344.4	375.5	402.5	444.2	476.7	528.9	537.1	605.8	614.9	611.9	636.3	642.7	668.4	662.8	
San Francisco	402.9	441.1	465.1	512.3	561.0	632.3	672.5	753.3	820.8	904.5	918.1	954.2	992.3	1002.2	1042.3	1044.2	
Seattle	292.2	317.8	341.8	358.4	371.5	424.4	450.2	515.1	570.5	603.7	612.8	620.6	645.4	656.1	682.3	687.9	

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

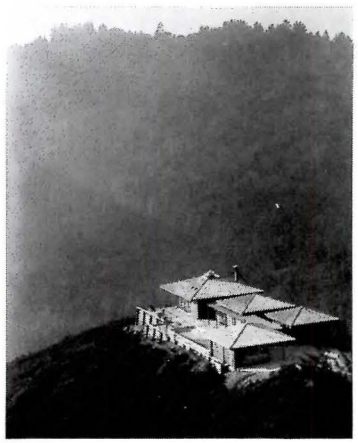



COURAGE CENTER

New directions for an established firm in a time of change

Five years ago, the 20-year-old firm of Marquis & Stoller disbanded with the departure of three of the principals. With a new group of partners and associates, Marquis Associates has, like many firms, been in a period of re-study. And at a time, as Robert Marquis puts it, "when manifestos of 'post-Modernism' abound, when nationally recognized practitioners find themselves in the curious position of imitating their younger colleagues, and when the pressures of a concerned citizenry call for more inclusive/less exclusive approaches to design." The changing attitudes and architecture of this well-established and design-conscious firm, as described in this article by Bob Marquis and partner Cathy Simon offer some food for thought . . .

"The organization of a new group of partners and associates has led inevitably to the examination of new directions, new philosophies, new concerns, and new ways of going about the business of creating architecture—a time of excitement and search, perhaps especially for those of us nurtured on the basic tenents of the now-traditonal Modern Movement. Because our firm has always worked in the tradition of the Bay Area Style, our transition may be less severe than if we had been involved in "glass-box-modernism" or the structural-technological investigations of the late 1960s. But transition it has been . . .



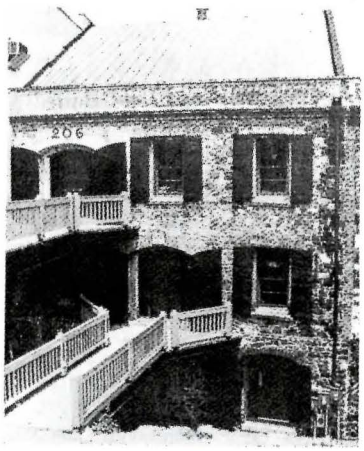
The forces and concepts that most influence our work today are

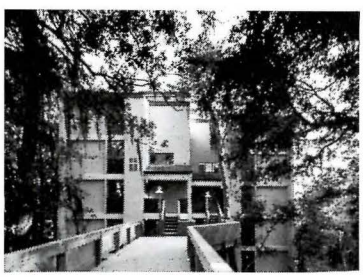
1. Contextual design . . .

We have always been concerned with fitting our buildings to sites with regard to light, views and contours. But we have now evolved a heightened concern with the important implications of design in *context,* particularly in urban environments. Rather than seeing buildings as isolated objects (which I think we did 10 years ago) we now try to incorporate them into the continuity of other buildings, streets, sidewalks, open spaces, materials, grain and scale that form communities. We hope they are positive, sympathetic additions to these places. Commodore Sloat School (page 96) respects the "Spanish" design of the surrounding community, both its houses and churches, and reflects it through use of materials and forms without imitating the older styles. The design of the St. Francis Yacht Club (page 94), acknowledges the original design (of 1927) by Willis Polk who, in his own time, had respected existing California architectural styles. The new building is in the footprint of the earlier building which burned in 1974, and uses the same basic forms, the same stucco and tile—but has a completely different interior.

2. Historic continuity . . .

We try to see buildings not only in relation to their present environments, but also in connection to the past *and* to the future, providing a sense of continuity for people. When forms and concepts from the past can be used to evolve good places for today and tomorrow, we welcome them and use them gladly. For instance, the Marquis and Stoller concept for Treetops housing on Hilton Head Island, South Carolina, derived from the gracious residences along Savannah's Factor's Walk; and the influence of the Victorian street of San Francisco with its bay

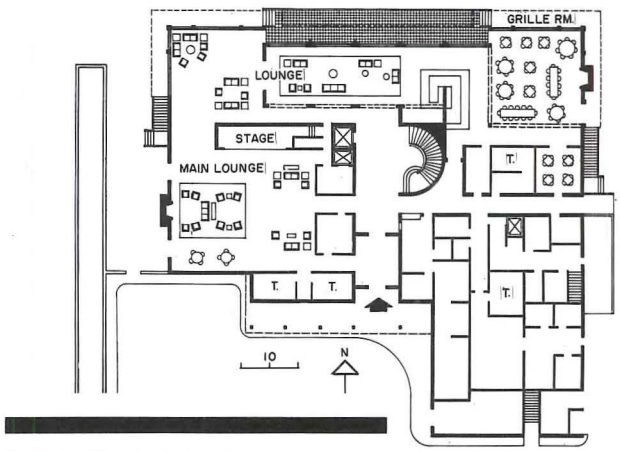




windows in evident in the St. Francis Square housing. In our work, we aspire toward a strong relationship between form and content, both as architecture and as meaning. In Commodore Sloat School, the new building refers

continued on page 102

Chuck Ashley photos

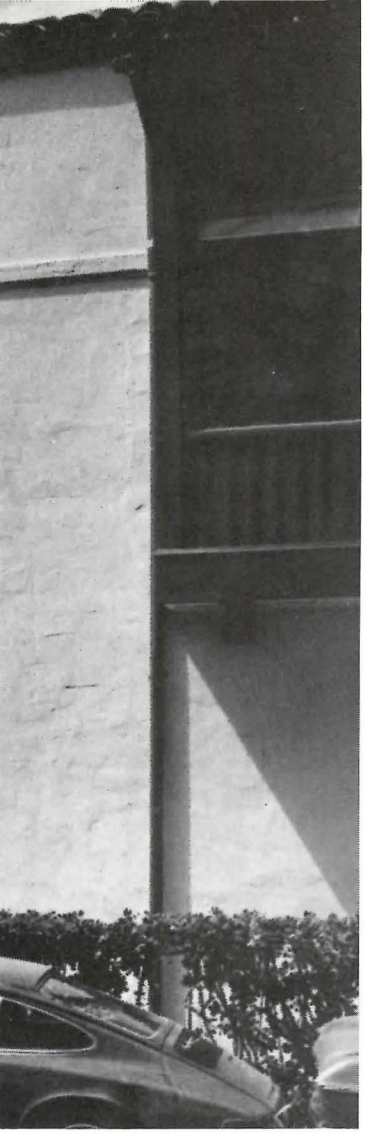


REUSE AND A STRONG NEW ORDER: ST. FRANCIS YACHT CLUB

The St. Francis Yacht club has been a landmark on San Francisco Bay since it was built in 1928 to designs by Willis Polk. In December 1976 a serious fire destroyed the interiors and a major portion of the walls of the building.

Marquis Associates' approach to the redesign and rebuilding was to preserve the general character of the exterior in massing and materials—barrel tile roofs and stucco walls with arched windows facing the magnificent views of the bay. But on the interior, where a series of alterations had confused the originally simple plan, the architects devised a series of larger more open spaces opening off a clear and generous circulation plan. The lobby is a strong directional space off which the various ground-floor lounges and a small grille room are reached. Along the line of travel, a grand circular stair winds up to the main dining room on the second floor—and here continuous glass walls offer spectacular views of the Bay, and the Golden Gate Bridge. The new furnishings and finishes are bright and appropriate to the club and properly leave any nautical "motif" to the fleet outside . . .

To minimize the glare common in waterside buildings, Marquis Associates used a long skylight at the rear of the dining room to balance the light; and another skylight in the main lobby brings light into this interior space. A new concrete slab was built on new piles to bring the building into code compliance, and the new structure is steel and wood frame.

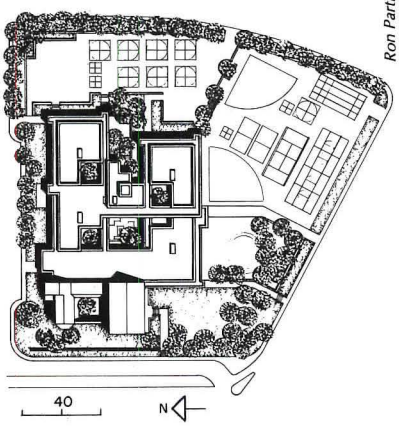


SAINT FRANCIS YACHT CLUB, San Francisco, California. Architect: *Marquis Associates—principal-in-charge, J. Peter Winkelstein; project architect: Mui Ho; interior designer: Phyllis Martin-Vegue.* Engineers: *Forell/Elsesser (structural); Gayner Engineers (mechanical); Marion, Cerbatos & Tomasi (electrical); The Engineering Enterprize (lighting); The Marshall Associates (kitchen).* General contractor: *Plant Brothers Corporation.*

Philip Molten photos except as noted

Ron Partridge

Ron Partridge

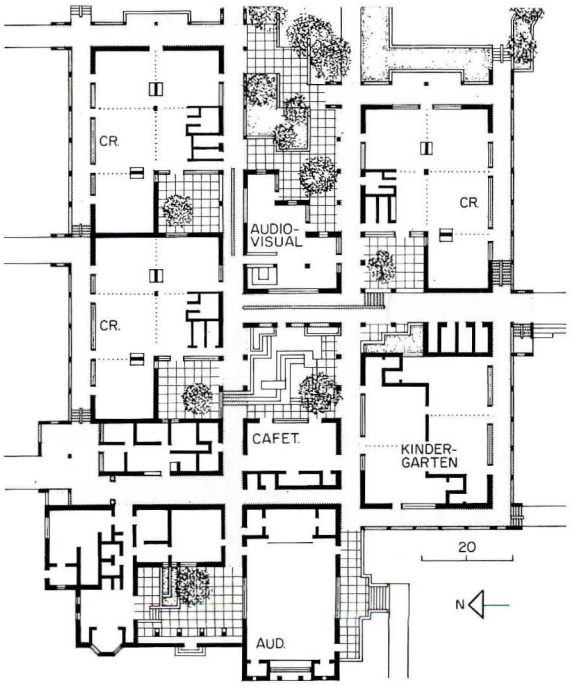


PLANNING DISCIPLINE: THE COMMODORE SLOAT SCHOOL

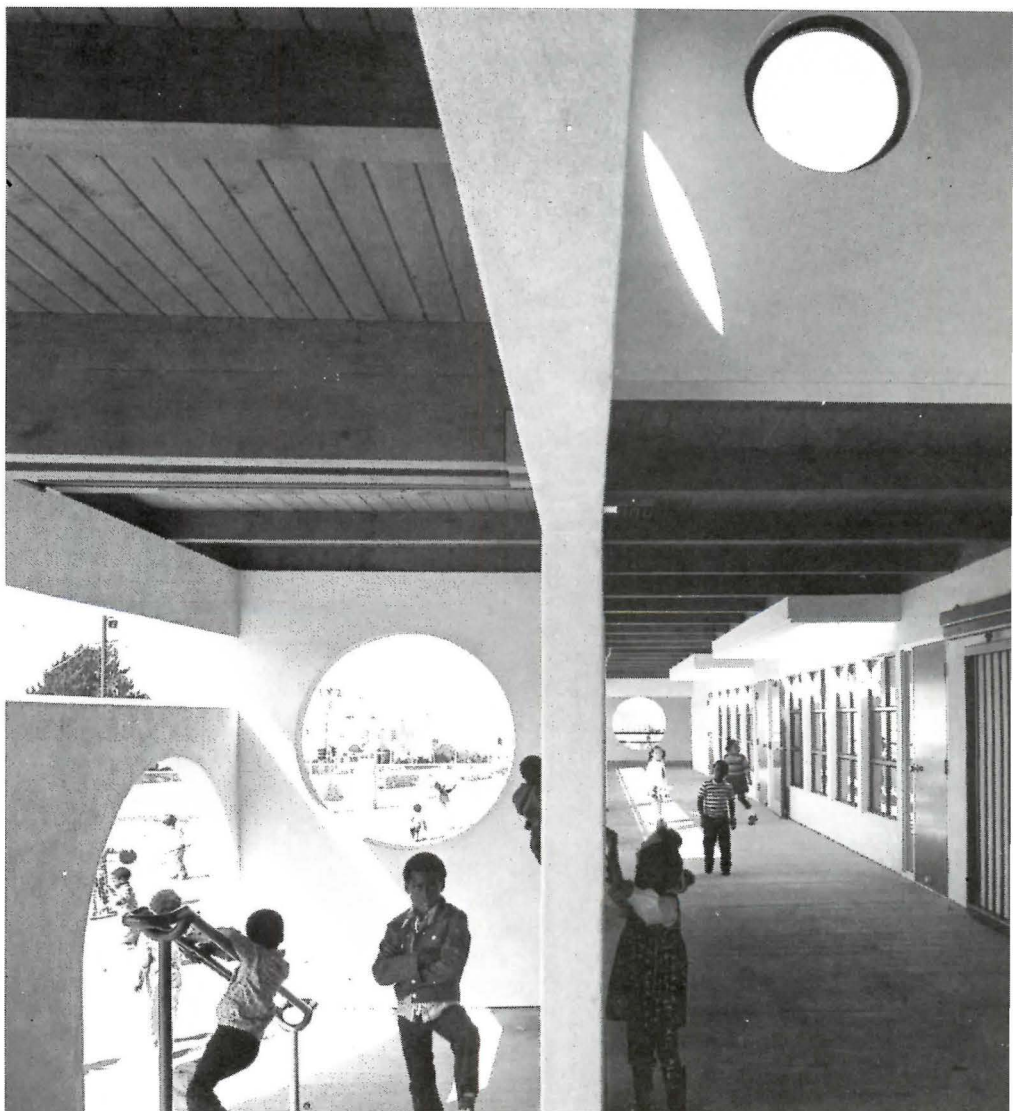
Located on a site in San Francisco that slopes toward ocean views and is surrounded by small-scale mission-style houses, this elementary school is at once sympathetic to its established environment and a demonstration of strong new thinking in planning, organization, and energy conservation. The building is low and steps down the slope to avoid the neighbors' views. The long walls of the 33,000-square-foot facility are separated into residential-scale elements. The finish is white stucco, used on most of the neighboring buildings.

Commodore Sloat may be among the first of a new wave of schools designed not only to conserve energy—but to reintroduce students to the outdoors. There are large windows in the classrooms that allow outside views, natural light within, and cross ventilation. To shade these windows, and to allow maximum flexibility of circulation, both the older part of the building, which includes a remodeled auditorium (bottom of plan), and the new parts of the school are connected by a forceful grid of outdoor corridors. These corridors surround the three new open-plan classroom blocks, the kindergarten, the cafeteria and the media center—as well as the activity-filled central courtyard, shown above. The project cost of $2,171,000 includes new construction, remodeling and site work. The construction is wood.

COMMODORE SLOAT SCHOOL, San Francisco, California. Owner: *San Francisco Unified School District*. Architects: *Marquis Associates—princi-*



pal-in-charge: J. Peter Winkelstein; project architect: Cathy Simon. Engineers: *Forell/Elsesser (structural); Montgomery & Roberts (mechanical); Marion, Cerbatos & Tomasi (electrical).* Consultants: *Wilson-Ihrig (acoustical); CHNMB (landscape); Robert Quagliata (stained glass); Marjorie Spiegelman (graphics); J. Paul Oppenheim (costs).* General contractor: *S.J. Amoroso Construction/ Trans-California Corporation.*



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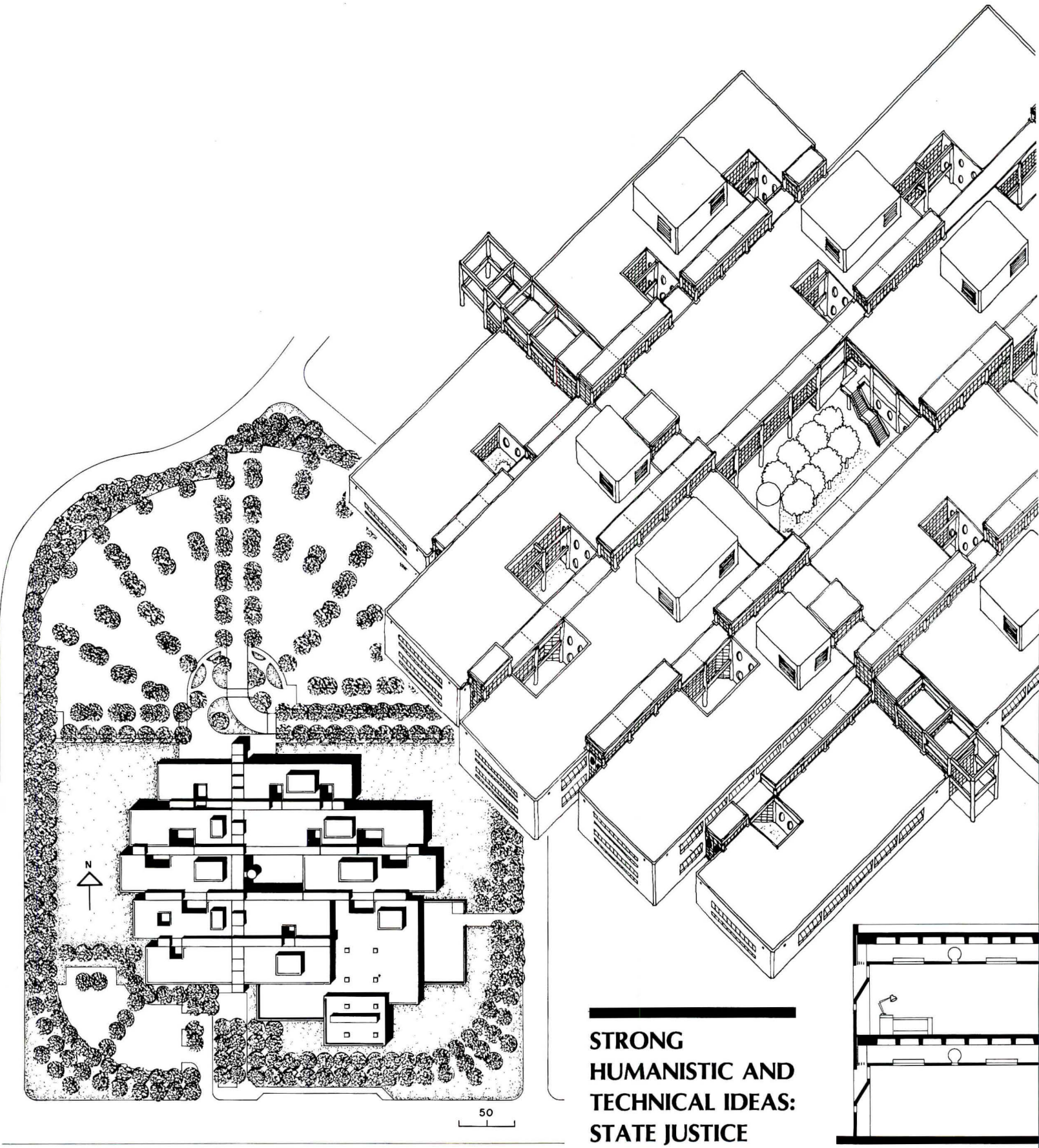
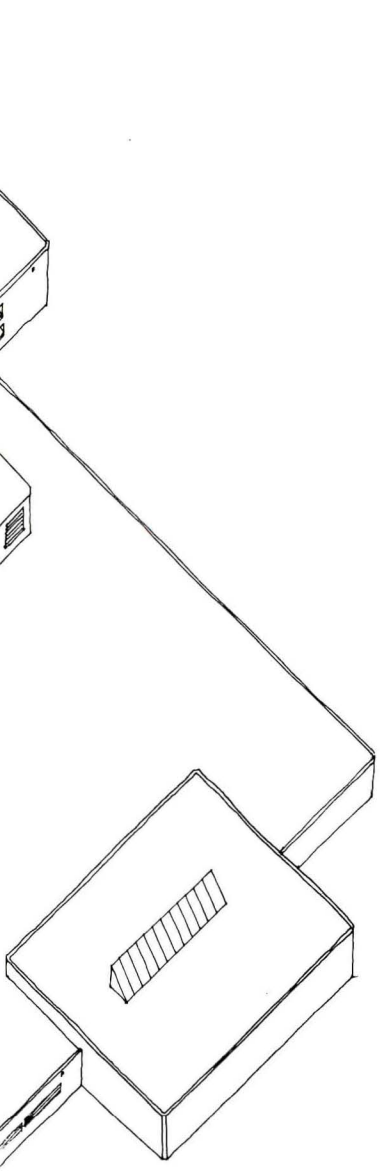


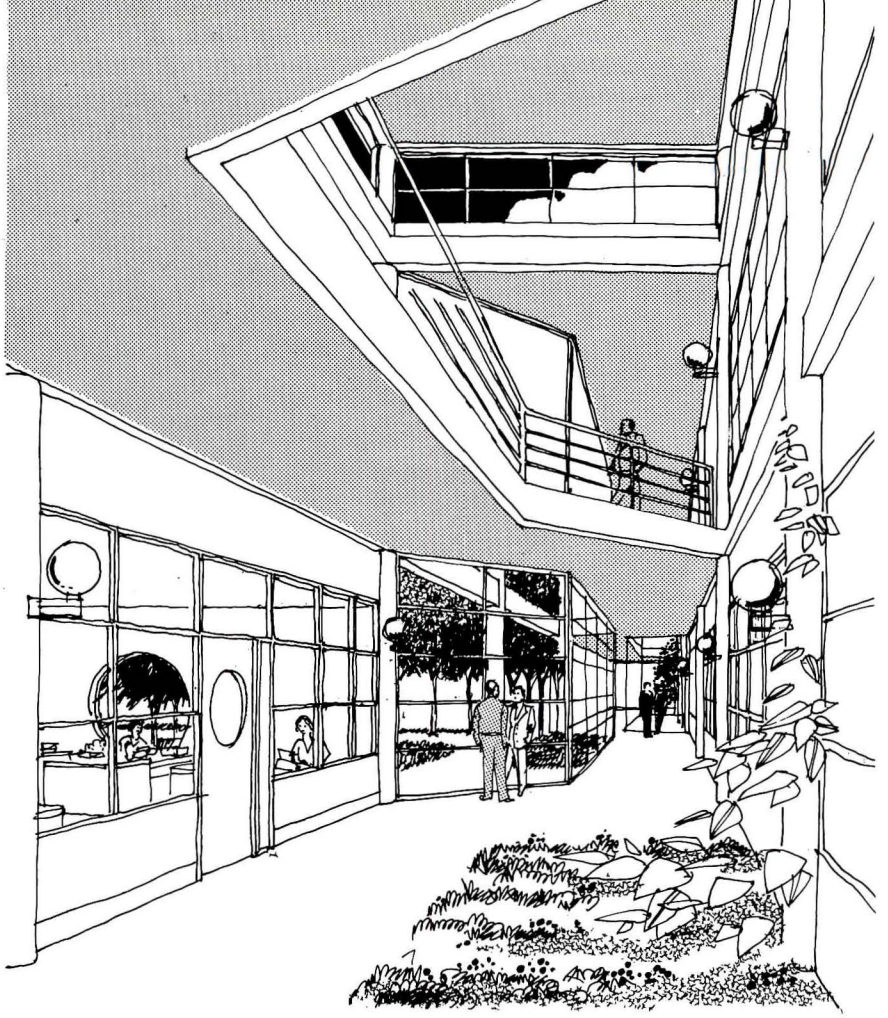
STRONG HUMANISTIC AND TECHNICAL IDEAS: STATE JUSTICE

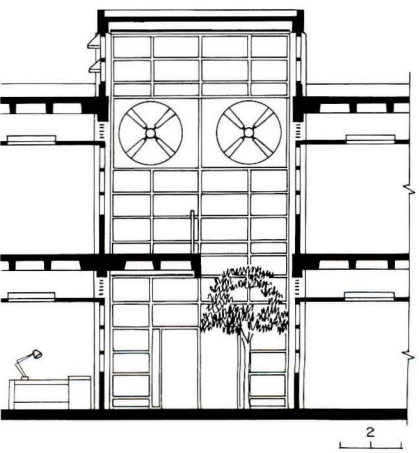
Part of a new generation of energy-conscious construction for the State government, California's new Department of Justice in Sacramento should offer not just very high heating and cooling efficiency—but a very high level of amenity for the occupants. The design for the 350,000-square-foot building is intended to achieve richly varied urban and urbane spaces on the interior while turning heavily insulated and heat reflective exterior walls to the semi-urban environment. The anticipated energy demand will be forty per cent of conventional construction. This effect will be due to both the skin and other sources. As indicated in the section, the skin will have high windows under overhangs for natural light on the interior. Night air will be drawn through plenums above the ceilings, and will be used to cool the large thermal mass of the concrete slabs.

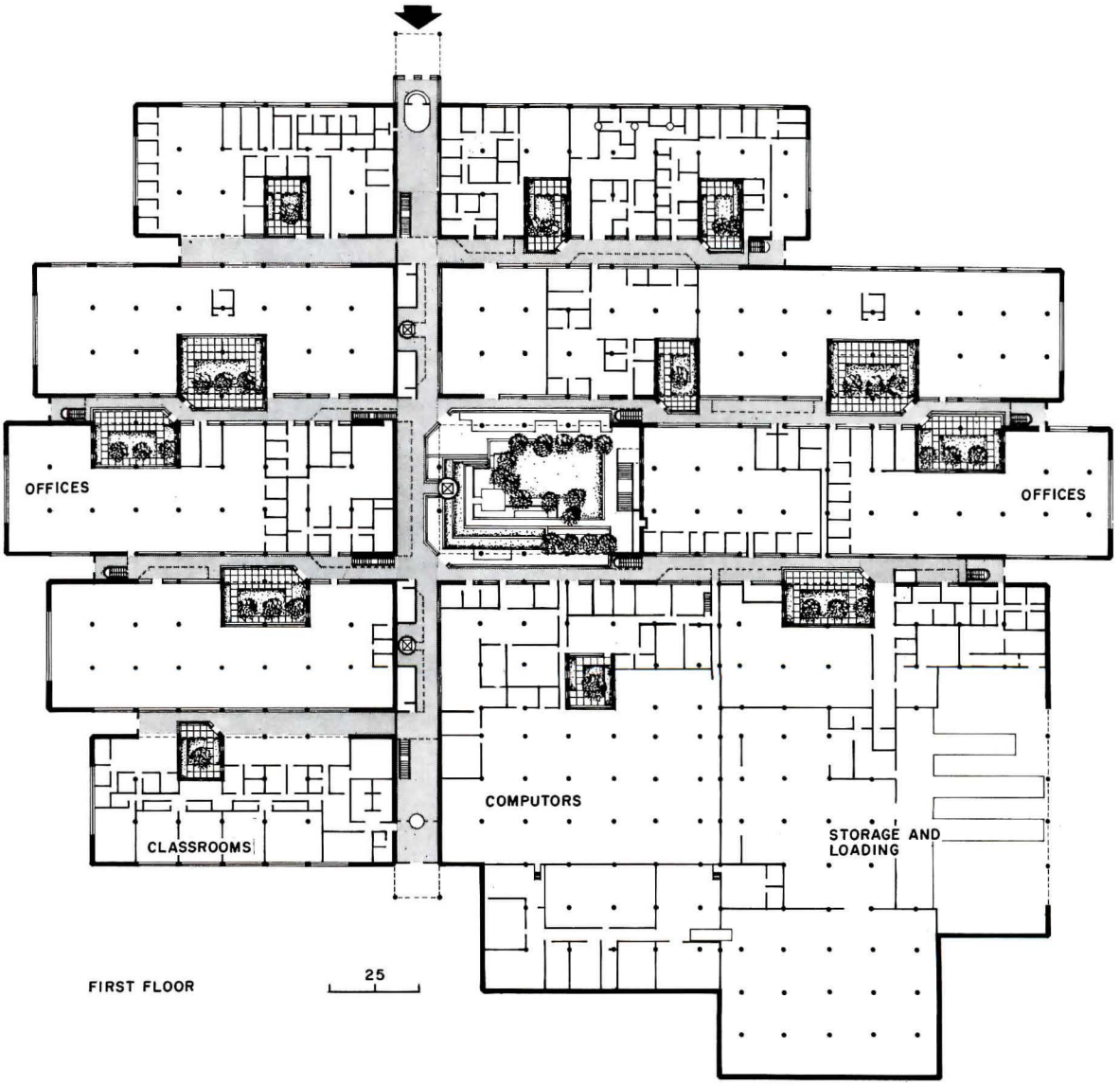
The importance of a pleasant and varied working environment is emphasized by the Justice Department's isolation in both geographic and security terms. Accordingly the architects have developed a plan which they liken to a city—with double-height corridors or "streets" that project above the main roof for natural light. Each of the working divisions (or "neighborhoods") within the 'city' has its zone, and is related to outdoor courtyards. A main central courtyard will provide a focus of activity.

OFFICE BUILDING CALIFORNIA DEPARTMENT OF JUSTICE, Sacramento, California. Client: *Department of General Services—State Architect:*

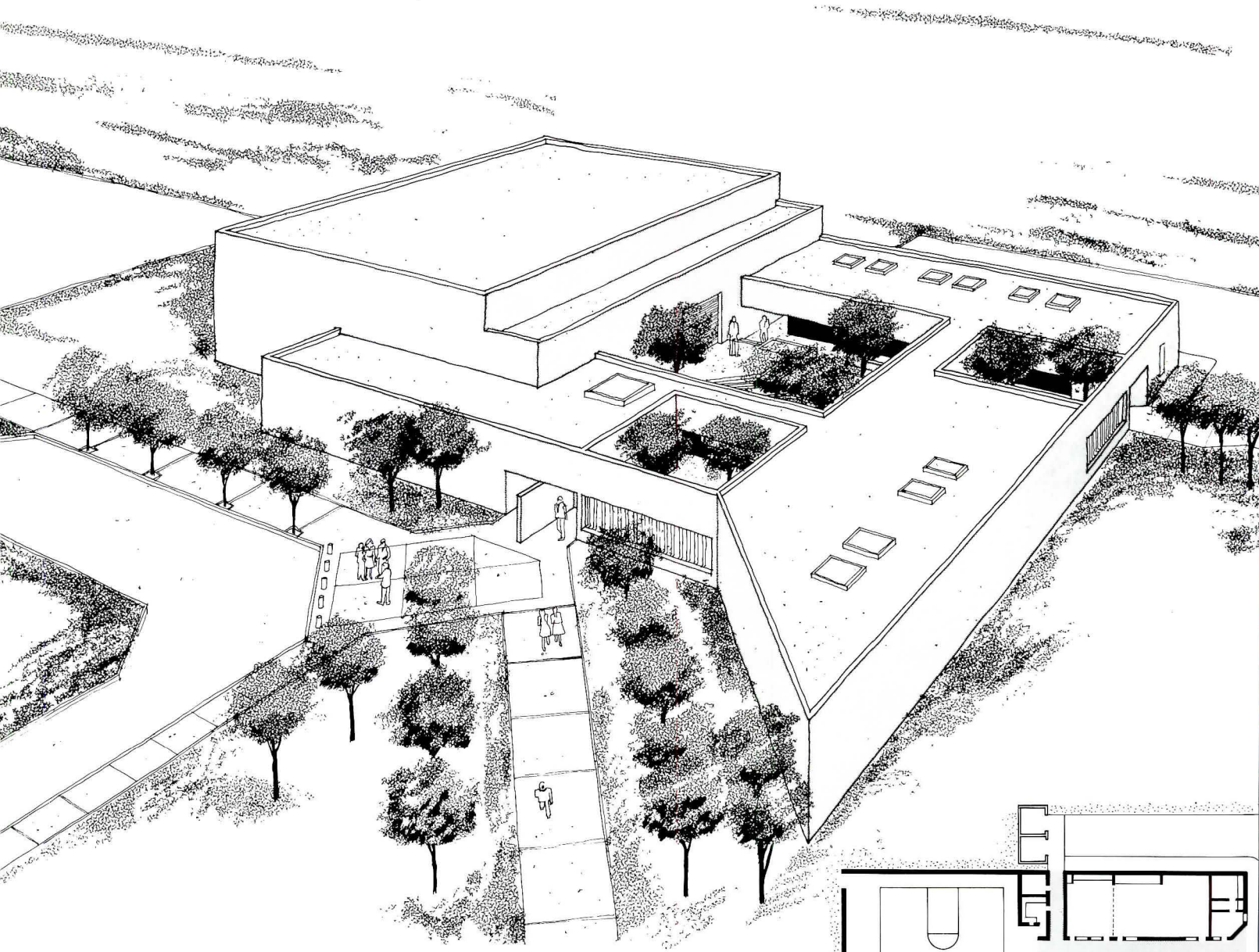


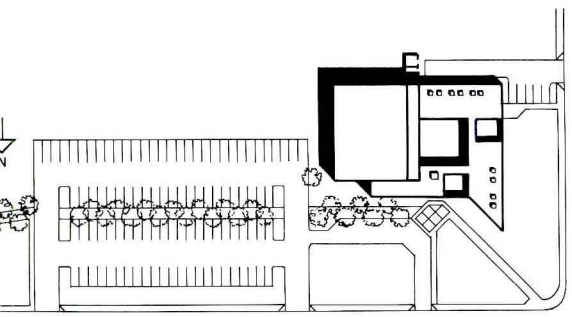


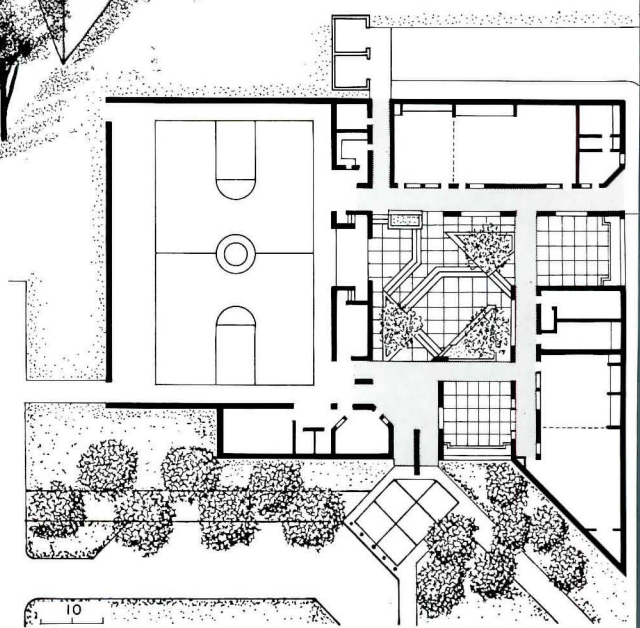




Sim Van der Ryn. Architects: *Marquis Associates—principal-in-charge: Robert Marquis; project architect: James Caldwell; architectural team: Robert Wulf, Bruce Bullman, Jacques de Brer, John Ellis, Douglas Shoemaker.* Engineers: *Rutherford-Chekene (mechanical); The Engineering Enterprise (electrical).* Consultants: *Dubin-Bloome (energy); CHNMB (landscape); Jim Burns (communications); Paul Oppenheim (construction cost).*





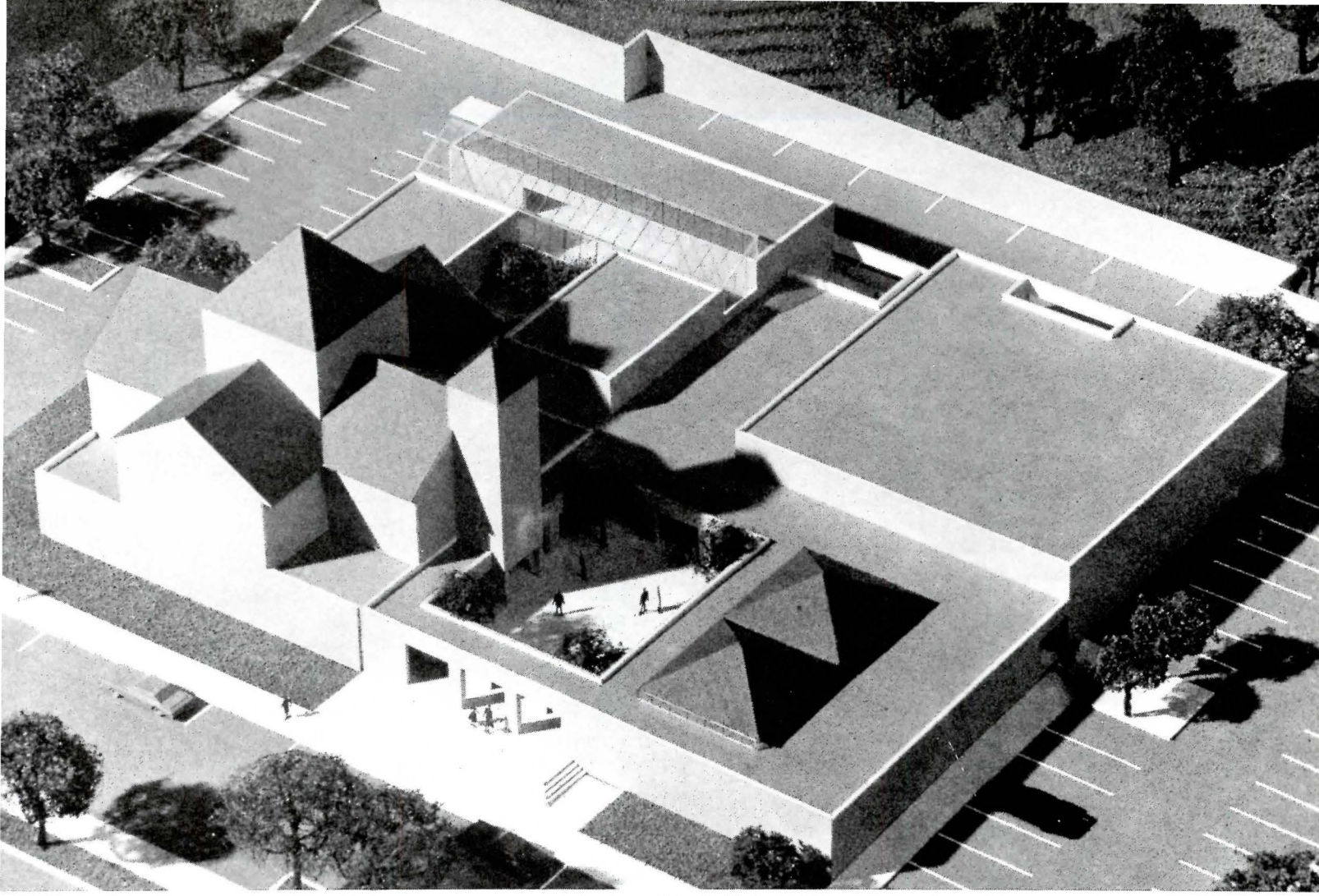


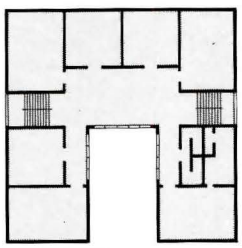
A SPECIAL EMPHASIS ON CONTEXT: STOCKTON'S COMMUNITY CENTER

This facility at the intersection of two residential streets in Stockton, California is to be community oriented not just in function—but in scale and character. The building is to keep a low profile to the streets around it, and this profile will be further softened by generous landscaping and berms. The wood-frame structure will have stucco walls, and these will afford excellent security—they are pierced by only two entrances and a connection for a future school to be built to the south (top of plans above).

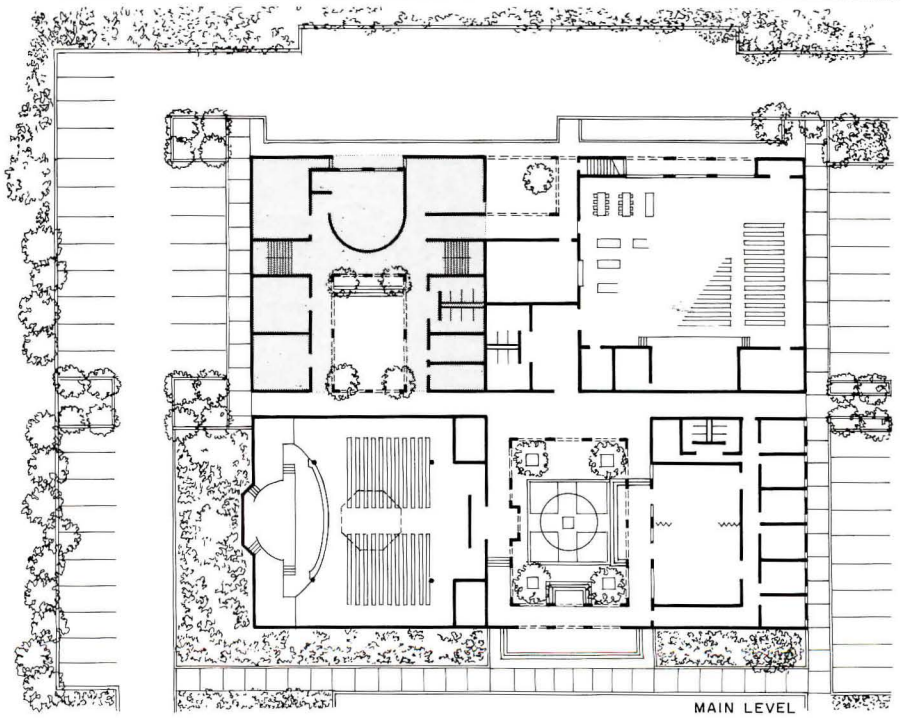
But the new center will be far from windowless. Three interior courts will provide pleasant views from interior spaces, places to lounge and relax, and seating for performances on a stage that can either face the gymnasium on the inside, or the central court outside. The brightness within will be further enhanced by vivid colors painted onto ceilings, pipes and window frames. Two multipurpose rooms and an office for a two-man police substation will complete the main facilities.

SEIFERT COMMUNITY CENTER, STOCKTON, California. Architects: *Marquis Associates—partner-in-charge: James Caldwell; project architect: Joseph Toussaint.* Engineers: *Raj Desai Associates (structural); Chamberlain & Painter, Inc. (mechanical/electrical); City of Stockton Public Works Department (site/construction administration).* Consultants: *J. Paul Oppenheim (costs); City of Stockton Parks and Recreation Department (landscape).* Contractors: *Stanfield and Moody (parking lots); F & H Construction (building).*





UPPER LEVEL



MAIN LEVEL

A SPECIAL EMPHASIS ON CONTINUITY: SAINT GREGORY ARMENIAN APOSTOLIC CHURCH

To be built in two phases, this complex in a residential and institutional area of San Francisco will—when complete—offer a strong visual message about the occupants and create for the church group a strong sense of community. The two-story school building for 200 students (upper left in plan) and the single-story social hall (upper right) are to be completed first. With the completion of the 500-seat church and a building for meeting rooms and offices (lower left and lower right in plan) the complex will be closed into a walled compound dominated by the towers of the church with their unmistakable historic form.

Again, Marquis Associates have produced a building which clearly zones its varied functions, but pulls those functions together with the strong organization of its internal circulation pattern—again around internal courts. Here, the pattern seems particularly appropriate, given the aim of psychological continuity. Despite the relatively small size of the project—there are 19,520 square feet of enclosed space—the main courtyard and the circulation paths would appear to create a very strong sense of place—of community. Parking for 91 cars will be provided.

SAINT GREGORY ARMENIAN APOSTOLIC CHURCH, San Francisco, California. Owner: *Saint Gregory Armenian Apostolic Church.* Architect: *Marquis Associates—principal-in-charge: J. Peter Winkelstein; project architect: Joseph Toussant.* Engineers: *Forell/Elsesser (structural); Gayner (mechanical/electrical).*

to the existing neo-Spanish auditorium and arcaded patio, reinterpreting those images into "new" architectural language. Additionally, glazed terracotta tile ornaments from the old building are incorporated into and embellish the new school. The St. Francis Yacht Club reflects Willis Polk's version of the Monterey Customs House on which the original Yacht Club was modeled. Similarly, the adaptation of traditional forms used in the St. Gregory's Church project (page 101) are meaningful to the Armenian worshipper; they connect it with the past and give significance to the entire new complex. Five years ago we might have felt the need to apologize for this "historicism." Not today.

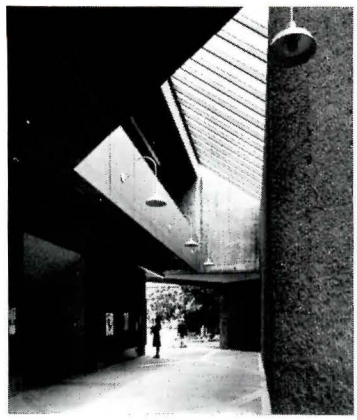
On the other hand, it seemed inappropriate to think of designing the huge Department of Justice complex (page 98)—with its vacant site on the outskirts of Sacramento—on some "historic" model such as the California Missions. We try to achieve clarity, directness and simplicity in historic allusions, but to avoid in-jokes relating to the things we learned in architectural history courses. We think architecture can often be fun—but only rarely be funny!

3. Circulation as a form determinant

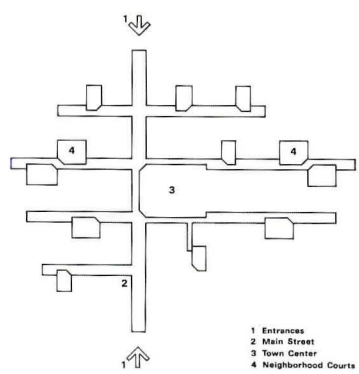
The analysis and articulation of the circulation network has become a stronger principle in our recent work. We hope the user immediately understands the organization of the design because of the clarity of the circulation network. Since activities should be accommodated well and pleasurably in buildings, we try to make these connections among activities and buildings—the corridors, walk-ways, courtyards—places of celebration and enrichment.

An early example of this in our work was the Learning Resources Center at University of California, Santa Barbara (Marquis and Stoller, Record, July 1977). At the intersection of several paths, the building itself became a covered "connection" through the campus, part of the *circulation network*, putting passers-by (indeed, passers-through) in touch with activities in the Learning Resources Center itself.

Commodore Sloat School is organized on a grid of interconnected covered walkways which define open spaces, classroom blocks, and special uses, as well as provide sheltered access to all parts of the building. The experience of moving around the school is enlivened by a series of courtyards, which serve the classroom blocks, bringing light into the covered walkways, and providing visual connections from one part of the building to another.



In the Justice Building (page 98), where security and controlled entry are major programmatic requirements, the circulation systems consists of a "main street," with only two entry points, and a series of "side streets" which intersect it. At the middle of the building the main street passes by a large central courtyard, the "Town Center," shared by all the building users. Departmental side streets cross the main street, providing access to the individual work spaces within the building. As at Commodore Sloat, courtyards are an important feature of the circulation system and enhance its use.



4. Structure and skin . . .

The expression of structure once important in our work, has become less of a factor. Most of the buildings we do must, by their very nature and economics, be constructed of studs with a membrane of stucco, metal or tile. Their walls are frequently load-bearing. Because of energy and cost considerations the windows are set into this skin (rather than from post to post). Thus skin takes on a greater importance.

In the Stockton Community Center (page 100) the client's program called for a windowless exterior. Therefore the outside is treated very simply, with grilles and detail occuring only at the entries. Once inside the central courtyard, the skin of the building remains a simple plane, but with large punched openings and arcades. Only in the heart of the building, in the interior spaces, is the structure of the beams and their supports at the wall revealed. The structure of the Justice Department complex, invisible behind the tile skin that covers the exterior, becomes apparent only at the entry and in the streets and courtyards of the building itself.

5. User involvement in design and planning . . .

We have long tried to practice a design philosophy sensitive to people's needs, as evidenced by the St. Francis Square Cooperative Apartments of 1963 (a pioneering and much-premiated 221d3 low-and middle-income project). But in the past five years, we have learned that it is not enough for the architect to be responsive, but that the community itself must play an active role in helping to make decisions about design. Wherever possible we involve the "real clients" (owners *and* users) in the decision-making process. We find that this participatory approach, far from "compromising" the designer's creative integrity, enriches it with a great wealth of ideas and informative. So we not only serve the community by a more inclusive process, we also benefit ourselves as architects. During the programming of Commodore Sloat School, parents, teachers, school administrators and neighbors all took part in a two-day workshop designed to arrive at a consensus on what direction the project should take (*Record*, June 1976). During the subsequent design process, this group actively participated, exercising a decisive and educated voice in decisions.

6. Energy conscious design

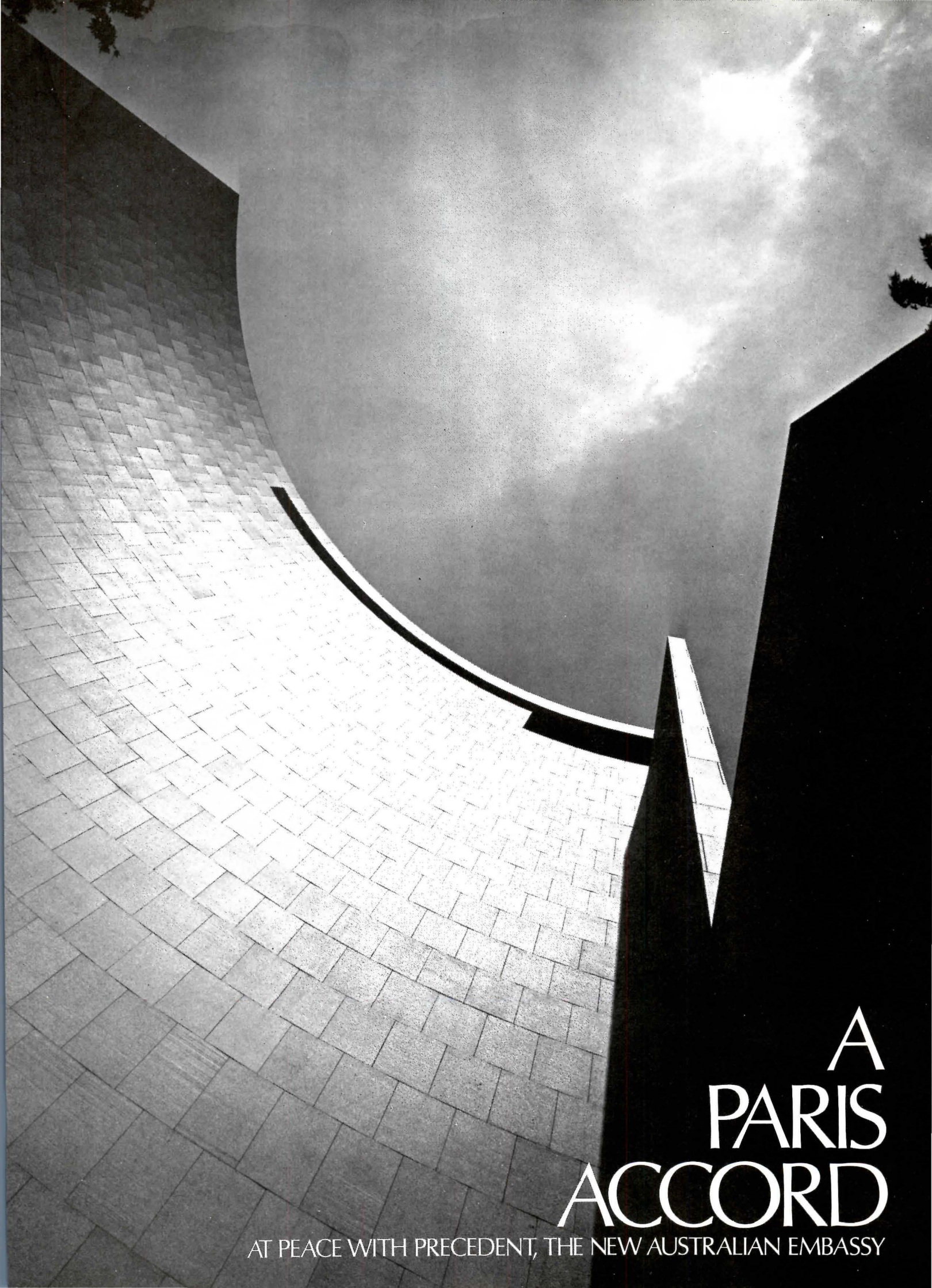
Like most architects, we are seeking passive solutions as preferable to technological solutions for our buildings. Like most architects, we are relatively new at this—and searching. But in attempting to be energy-conservative, we hope also to develop not only more responsive architecture, but places that give people more control over their daily working and living environments.

Working with Sim Van der Ryn and the California Office of State Architect on the Justice Department complex has enabled us to become involved in energy-conscious design on a large scale. There, the streets act as the "lungs" of the building, drawing cool night air through plenums and exhausting warm daytime air, while the structural mass of the building responds to the varying temperatures passing over it. For us, an exciting aspect of energy conscious design is the emergence of new forms, or perhaps, the rebirth of principles used in past vernacular architecture that responded directly to the needs of daily life and limitations of modest technology. We are currently working toward their imaginative translation into forms and uses to serve contemporary society.

A final thought on organization . . .

Marquis Associates today is quite different from its predecessor firm, which was traditionally organized under the strong control of its two senior partners. Today, we view our office as a creative community, not a hierarchical group consisting of bosses and workers, professionals and non-professionals. We think that the totality of shared experience brings results that are more exciting and appropriate than would emerge from the same people working "separately" in a traditional office organization. Our office is based on an "open office" concept with weekly management meetings, open to everyone, at which not just direction—but finances and policy are decided. Weekly "show and tells" are held at which a project team presents its work to the entire office for discussion and criticism. Often, colleagues bring in slide shows of the work of other architects, of trips, of special concerns. We have also had good contributions from consultants and other friends at office gatherings. We are constantly debating our agreements and differences about where we are, where we would like to go, and how we would like to get there . . .

—Robert Marquis and Cathy Simon



A PARIS ACCORD

AT PEACE WITH PRECEDENT, THE NEW AUSTRALIAN EMBASSY

In his book *Ferragus,* Honore de Balzac wrote, "The streets of Paris have human qualities, against which we have no defense."

While many recent buildings in Paris look quite defensive in this regard, the new Australian Embassy is forthcoming with allusions of the most affable sort to the civility and flair of this great capital—as well as to the unpretentious *elan* of the industrious Australian state.

Harry Seidler & Associates, the architect, has responded to a tightly defined program and a tightly confined site, drawing upon the axial relationships and architectural precedents of the surrounding district to achieve a demeanor of scale, layout, and detail that is at once dashing and disciplined.

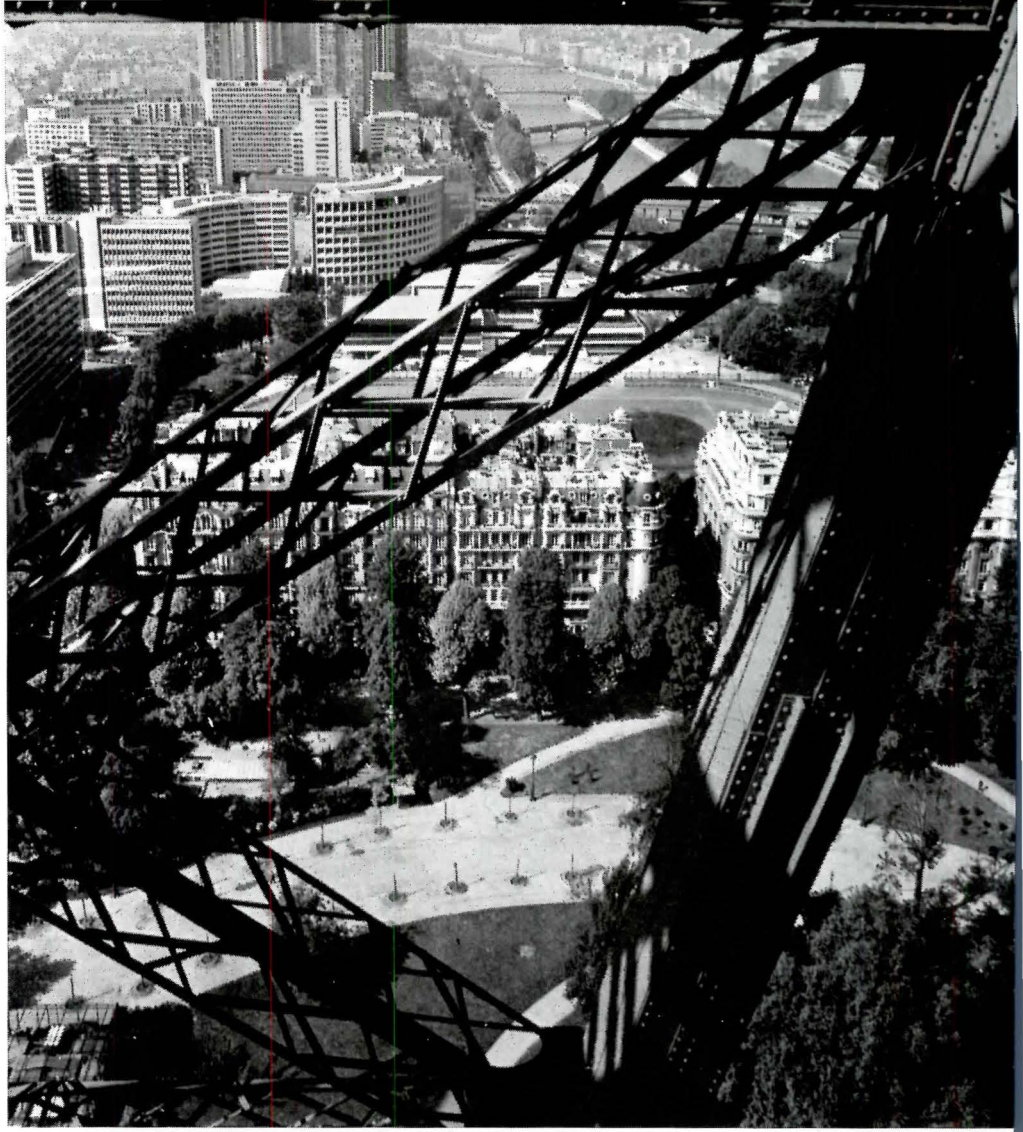
The site, roughly triangular, across the lengthly Quai Branly from the River Seine, had to accommodate both a seven-story chancellery and, in a separate building, a nine-story apartment house. The northerly vista from the site encompasses the features of a resplendent axis—the Palais de Chaillot, across the Seine to the northwest, with the Trocadero gardens cascading down to the water; the Eiffel Tower, this side of the Seine, and about a quarter of a mile from the Embassy site; the Champs de Mars, a playing, sporting, and exposition ground dating from the 18th Century; and, at the southeasterly extreme of the axis, the Ecole Militaire.

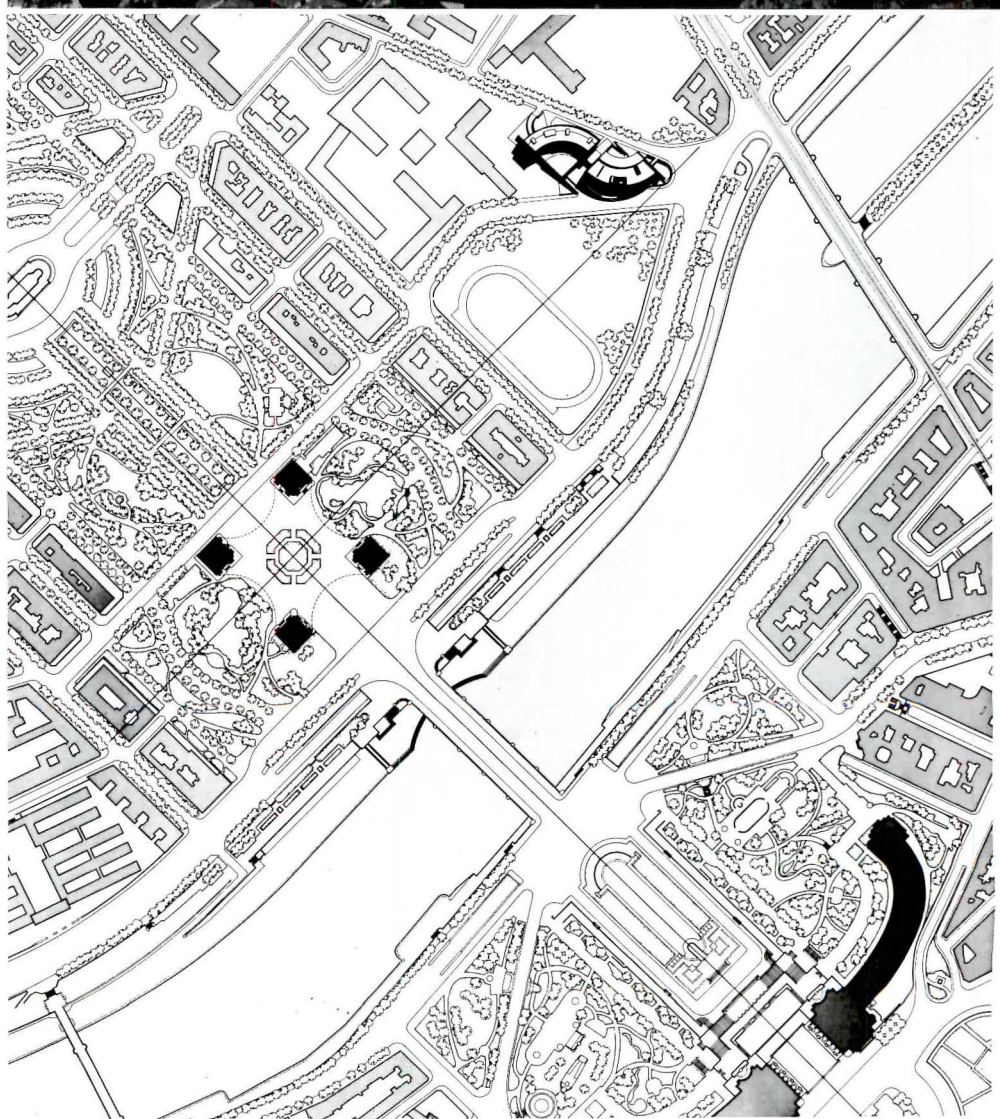
No self-respecting architect would fool around with a deterministic, doctrinaire modernism given an environment like this. And even if there were a temptation, the authorities of Paris have considerable say about how new buildings should relate to the city's historical texture. Their say included a height limit of 102 feet, a ruling that the building cover no more than 50 per cent of the site, general guidelines as to the sympathetic use of materials, and an adamant if open-minded assumption that the building's configuration reinforce the strong axiality of the Champ de Mars and its cross axis running through the Eiffel Tower. How could an architect, even as good an architect as Harry Seidler, respond to so much — the dictates of his government, the dictates of Paris authorities, the dictates of his own spit-and-polish passion for modernist principles — on such an awkwardly shaped, hemmed-in parcel?

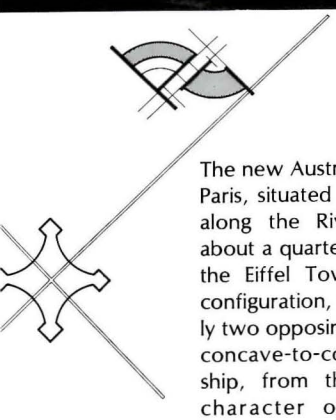
Conventionally configured buildings, squared-off in plan to recall the nearby cross axes, wouldn't work — not if all the functional requirements of the program were to be fulfilled and, at the same time, that 50 per cent site coverage were to be met. Which helps to explain the tensional, and yet very tranquil, disposition of Seidler's solution.

Here is what Seidler did within all these constraints: Seidler went for baroque. But with his bent for rationalism in architecture, informed by his education under Walter Gropius and Marcel Breuer at Harvard, the curves he has thrown are controlled.

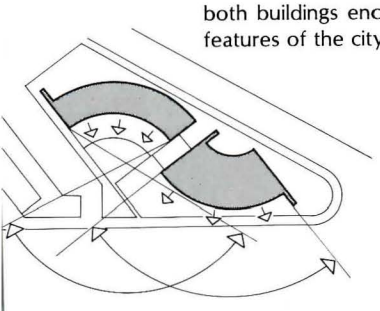
Instead of aligning his new buildings with the cross axes in a literal sense, he has deftly alluded to them. These axes were brought over here, generating two opposing quad-

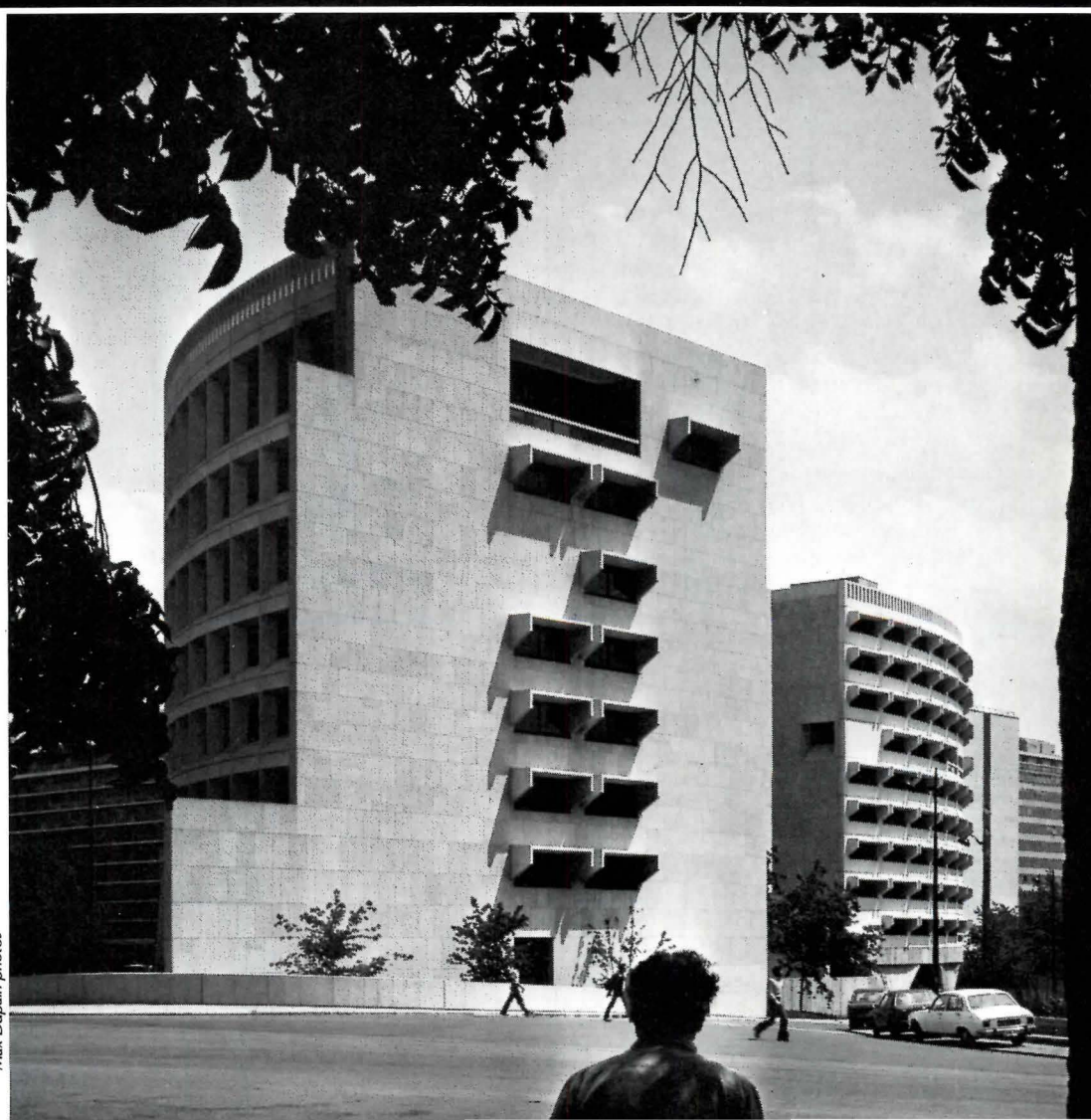






The new Australian Embassy in Paris, situated by Quai Branly, along the River Seine, and about a quarter of a mile from the Eiffel Tower, derives its configuration, which is basically two opposing quadrants in a concave-to-convex relationship, from the strong axial character of the nearby Champ de Mar and its major cross axis denoted by the location of the Eiffel. Architect Harry Seidler & Associates has in effect transplanted this axial configuration to the site of the embassy, and, within these fields of force, has inscribed the opposing curves of the facades of the two buildings — one a chancellery, the other an apartment house. The end walls maintain axial alignment while, sweeping between them, the facades of both buildings encompass the features of the cityscape.





Max Dupain photos

rants within the triangular site, and, within these quadrants, Seidler has inscribed opposing sets of facades — one concave, one convex.

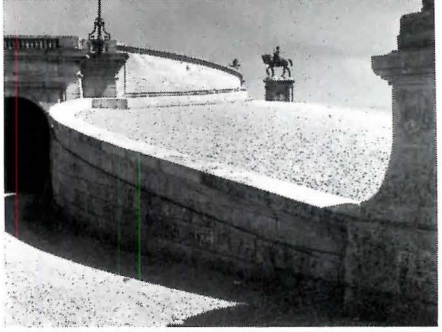
The actual axes are met and reinforced by the strong end walls which project out beyond the sweeping curved facades, stepping down to grade. This solution allows the buildings, which are joined on the ground-floor level, to absorb themselves, their interiors, and occupants, in the magnificent views to the north while, in effect, demuring from the less notable structures and a recent development district, goofy and gunked-up, to the south. All the living rooms in the apartment house partake of the grander northerly perspective, the bedroom areas being on the southerly side, as do the offices and meeting rooms of the chancellery.

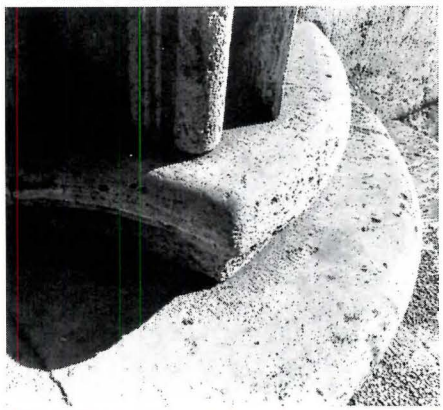
In defining its own place, confiding its own presence, Seidler has created an active architecture which, despite its conceptual and formal aplomb, is discreet — letting those "human qualities against which we have no defense" permeate his environment, even as the streets, spaces, axes, and landmarks gave his impulse for doing so some distinctly favorable edges to work from. Here is recognition of the city, physical relationship to it, with an expressive character of its own.

Casting an eye, hereabouts, one might conclude, and too quickly, that Siedler was inspired mainly by architectural precedent. (He himself cites the arc-shaped excercises of painter Frank Stella and sculptor Norman Carlberg.) But surely, born in Austria, brought up in England, schooled at Harvard, Seidler has come to understand the uses of precedent generally, in the context of new challenges. So what precedents were handy here?

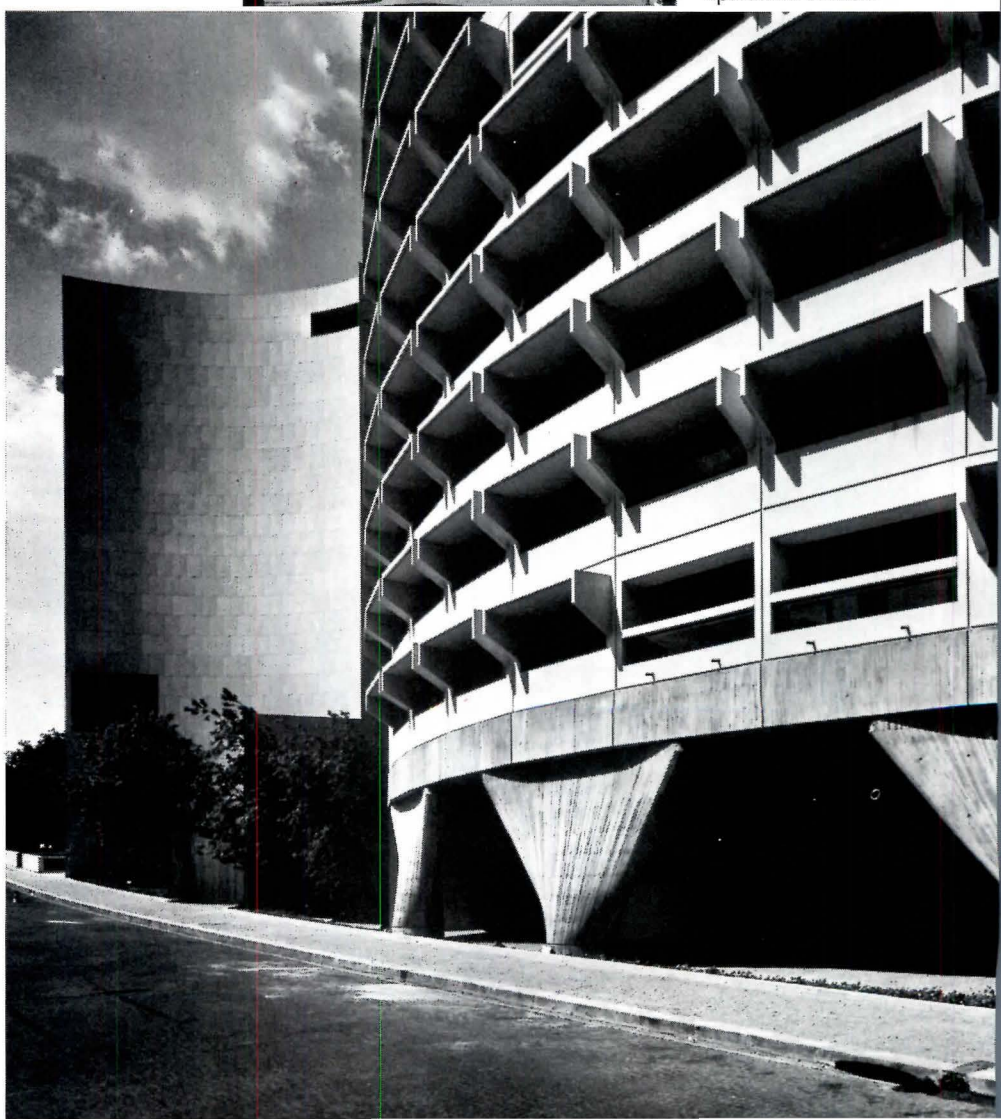
There is the Palais de Chaillot, across the Seine, with its opposing, curved wings, but done in the mid-1930s. The authorities of Paris agreed that it had indeed paid sufficient respect to the axial relationship of the Champ de Mars, and if that had been brought off in a symmetrical format, Seidler just might have something in suggesting that it could work in his more subtle solution. His conviction was underscored by knowing references to the baroque massing and detailing that abound throughout Paris, France, and Europe generally — the opposing quadrants and curves flowing in and out of each other, that one sees in old chateaux and churches.

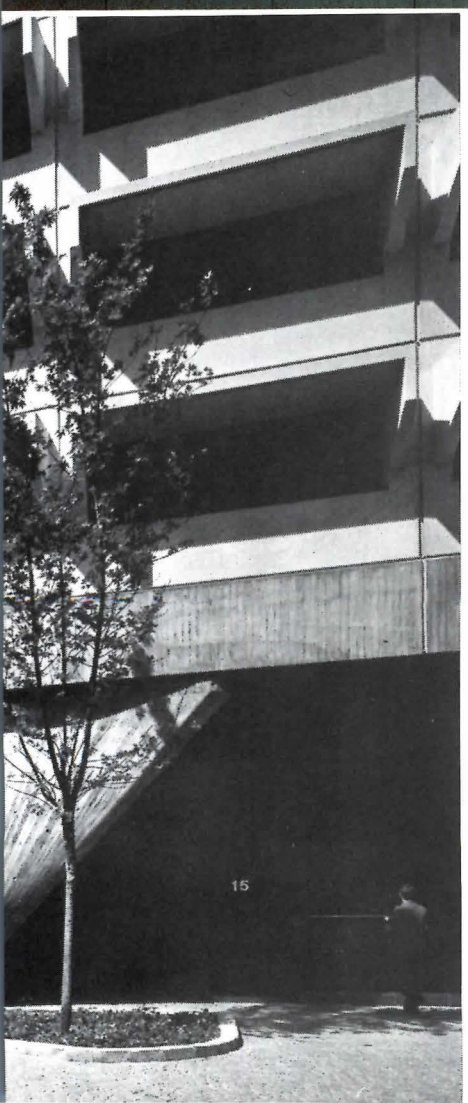
Seidler, in citing baroque, is citing an ebullience which, in the most capable hands, was never arbitrary. It was an esthetic with its own ethical constraints, and this architect, in explaining that his work here interprets a tradition, is declaring nothing if not an analogous approach to dealing with freedom within constraints — be they physical, as here along Quai Branly between Rue Jean Rey and Rue de la Federation, or ethical. If it may be said that Seidler's work here, and his work generally, is a cut above, it is because his formal and technical propositions have been developed with this understanding in mind: Physical constraints and ethical constraints are, in the realm of esthetics, as naturally

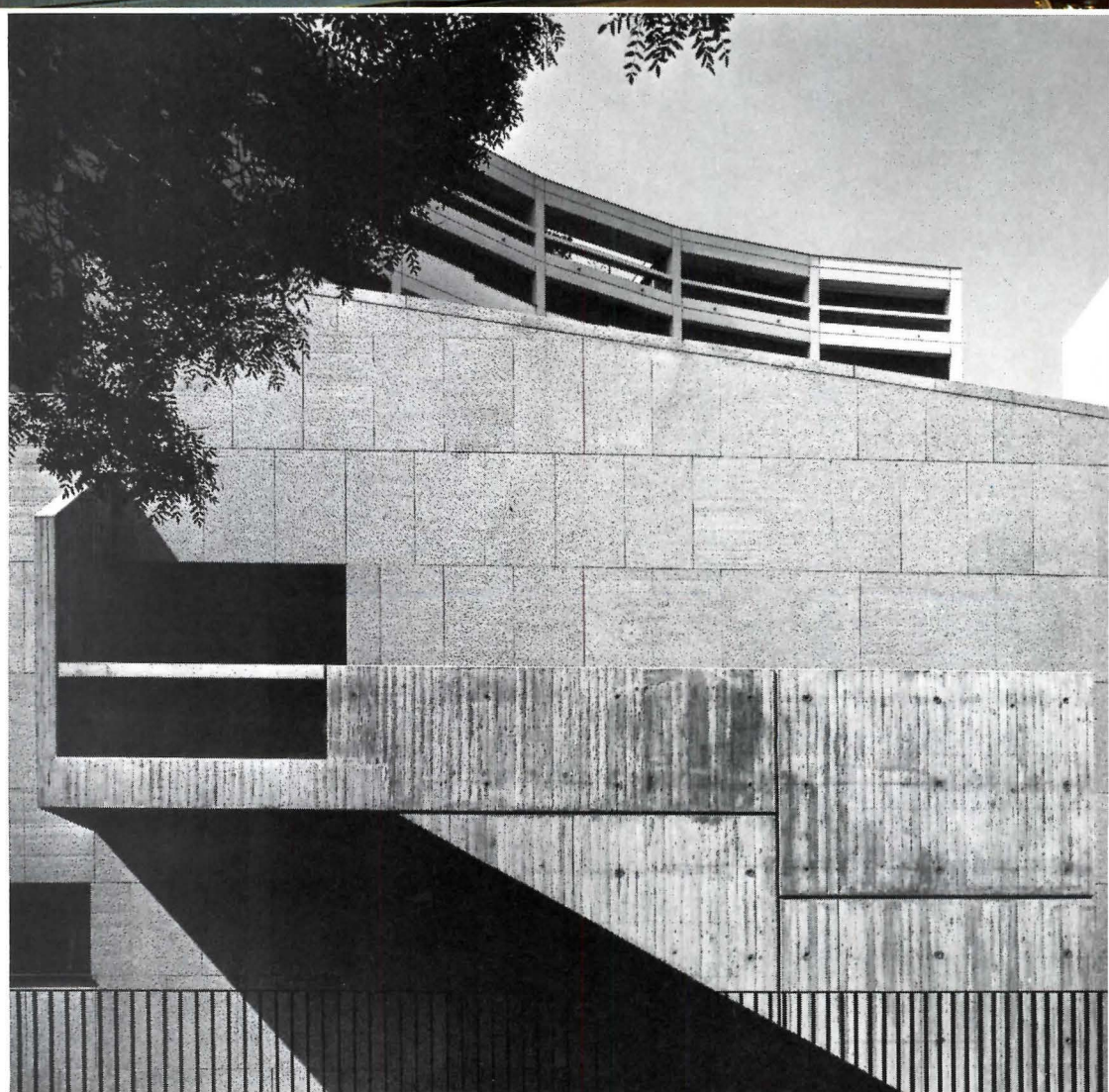




The chancellery of the Australian Embassy (right) and the apartment house accommodating its ambassadors and staff (below) are arranged in opposition to each other, setting up a tensional array of curving facades that recall the baroque spirit of such precedents as the Chateaux de Chantilly (left, top) and the disciplined but dynamic detailing of Borromini (left, middle). The continuity, consistency, and cadence of the street facades of Paris as developed under Baron Haussmann in the 19th Century (left, bottom) are also recalled by the use of several types of precast elements — impeccably manufactured with a close-grained aggregate of white quartz. The uniformity of these facades is at once relieved and enlivened where the precast elements give way, here and there, to deep balconied recesses. Board-formed concrete, in pleasing contrast, denotes the entrance to the auditorium (opposite, below), and the splaying haunches under the apartment section.







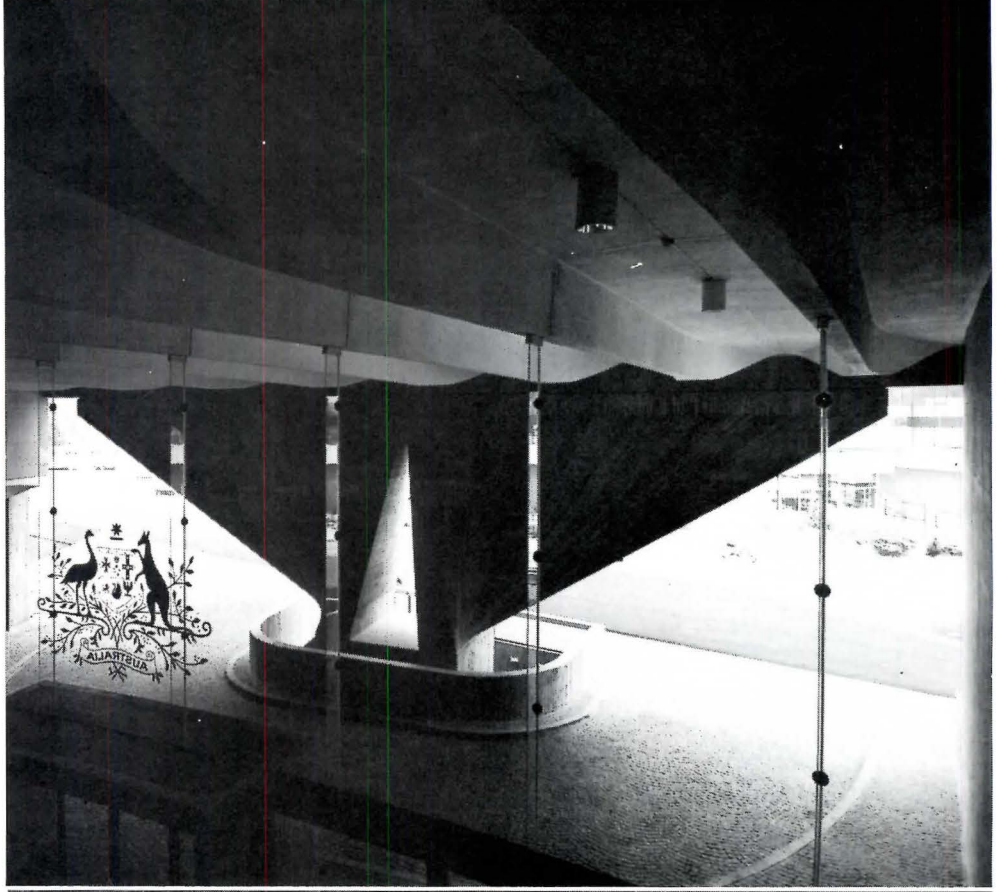
related to one another as, if one will, concave to convex. And in a city where architecture has been the most public art (where hasn't the finest architecture been conceived with this consideration in mind?), Seidler's embassy *has* good public manners — the kind so genuine as to preclude manner*isms* of the sort that buildings or, for that matter, people display when their only excuse for existing is to call attention to themselves.

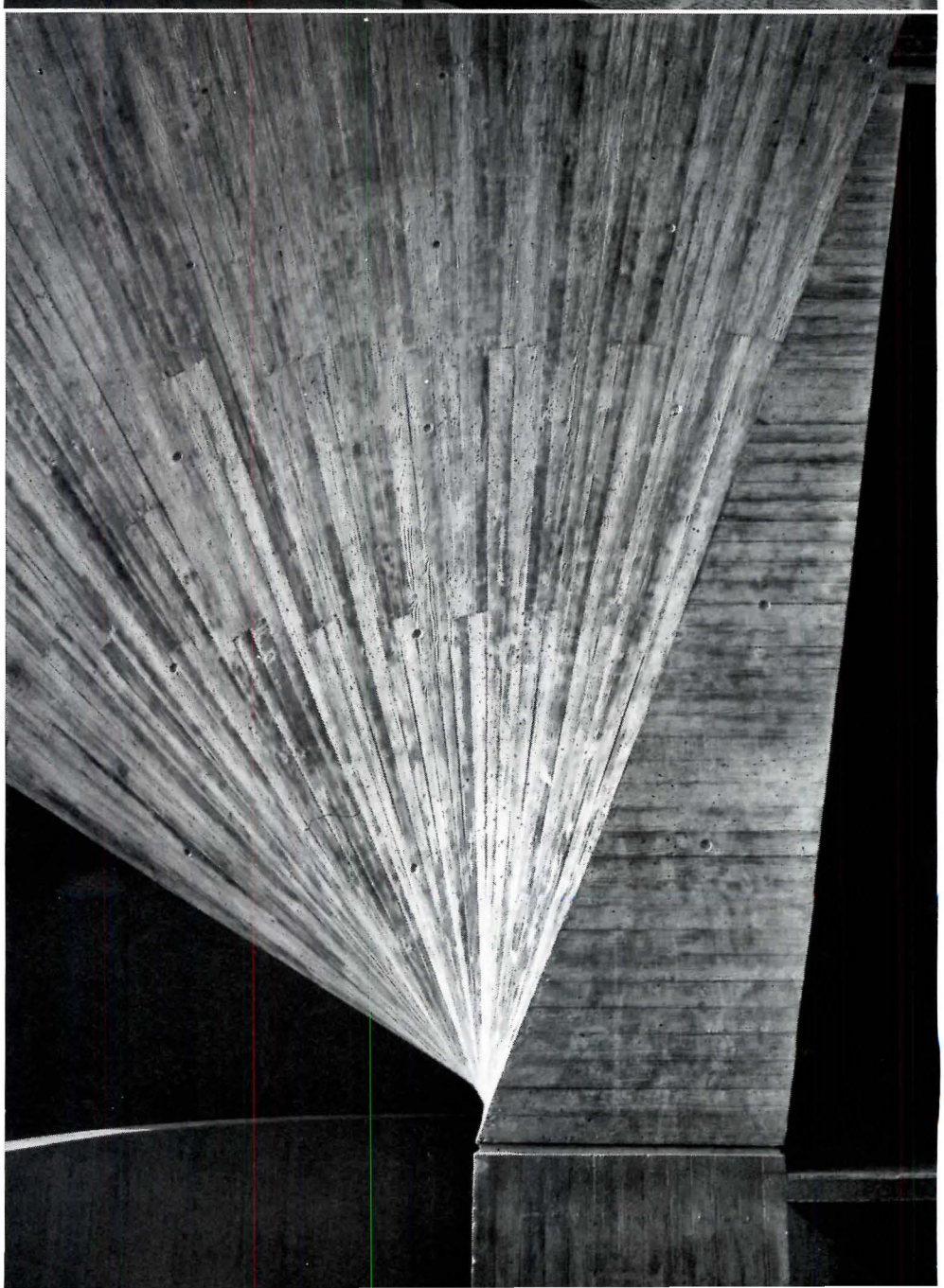
In a great many respects, he went back to school, that of his own experience, in thinking out this solution. His consultant and *architecte d'operation* was his old mentor and friend Marcel Breuer, whose Paris office saw to things under the supervision of Breuer's associate Mario Jossa. Seidler's structural consultant was Pier Luigi Nervi, who, in turn, had been associated with Breuer and Bernard Zehrfuss on UNESCO House, back in the late 1950s — itself a study in curvilinear massing, and situated just across Place de Fontenoy from the Ecole de Militaire.

This association was only partly a "sentimental journey." Seidler not only remembers but relishes the rationalist and structuralist underpinnings of modernism as evangelized by the Bauhaus and, later, its curricular offspring at Harvard and elsewhere. In fact, he is one of the few who have not made much ado in recent years about having transcended, somehow, those basic tenets. He is not interested in overthrowing a movement, which, to many minds, has become an establishment esthetic. He has been interested in working out certain basic forms of structural expression which, in principle, are susceptible to many varying applications. "Ornamentation" becomes with him a direct, unadorned, and unforced manifestation of structural rationale — and those structural pieces are no less refined in execution or rich in expressiveness because they are standardized, repetitive, and prefabricated. These goals were aspired to by the pioneers of modernism, most zealously its European pioneers, and they are aspirations that Seidler has not given up on, but really runs with.

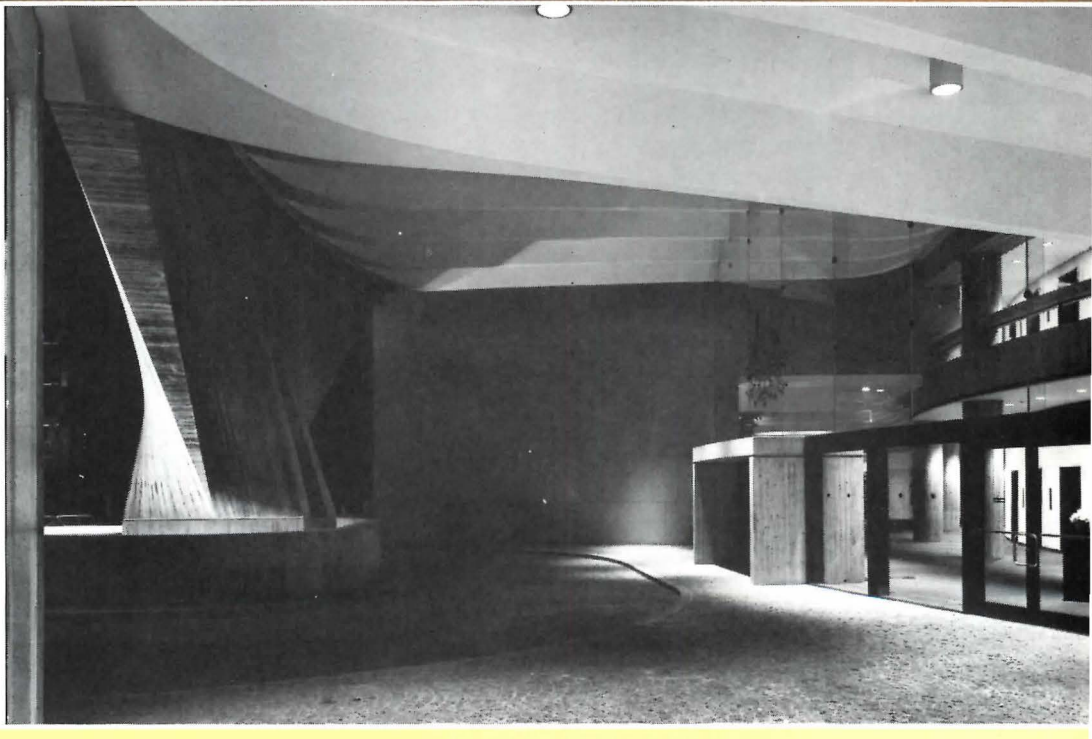
If this be "defending the faith," fine. At least he has one and, more, he realizes that it is a faith that does not belong to or originate with him — or any one architect — alone. Louis Kahn once said, mystifying many, that he thought of his buildings as ways "to express that which does not belong to me." Seidler, who isn't mystical at all, nevertheless similarly realizes that a truly original building originates within multiple, over-lapping impulses, precedents, and insights; that creativity consists in organizing the forces that swirl around and impinge upon a place and a program, finally ferreting out and refining those formal and technical properties that seem to ring most clearly across the board.

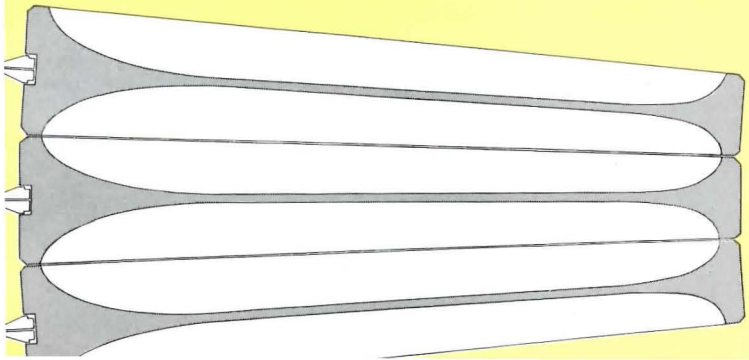
This is not the end of imagination in architecture, but the beginning of it — so much more so than the much-touted trotting out of "stylistic" precedents — be they populist or patrician in origin — as though architectural creativity is an enactment of "Saturday Night Fever" or the annual horse show in elegant East Hampton.

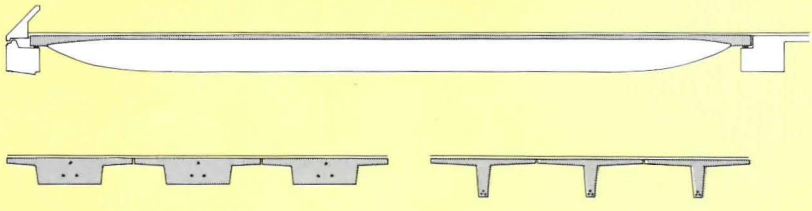




A dramatic concrete pylon, rising up in a flourish of hyperbolic surfaces, both supports and celebrates the two-level-high entranceway of the chancellery (opposite page, and photo, right). The 53-foot-long T-beams used in this section of the Embassy (details, below) are both elegant and efficient, allowing for the interweaving of mechanical and lighting runs, great spatial flexibility in the upper office floors, and considerable drama where they are left exposed, as indeed they deserve to be, in such public areas as the large main-level exhibition hall (above). Upon driving up, or walking in, the material, structural, and symbolic nature of the architecture confides itself with a grace that is almost lingual, the gently curving lines of the beams brought outside this formal entrance.







So Seidler did not reinvent any wheels, or quadrants, in Paris. He organized, once more, the things he has come to understand and believe in with the things that the specific circumstances in Paris gave him to understand and believe in. The resulting embassy is somehow familiar, and very fresh.

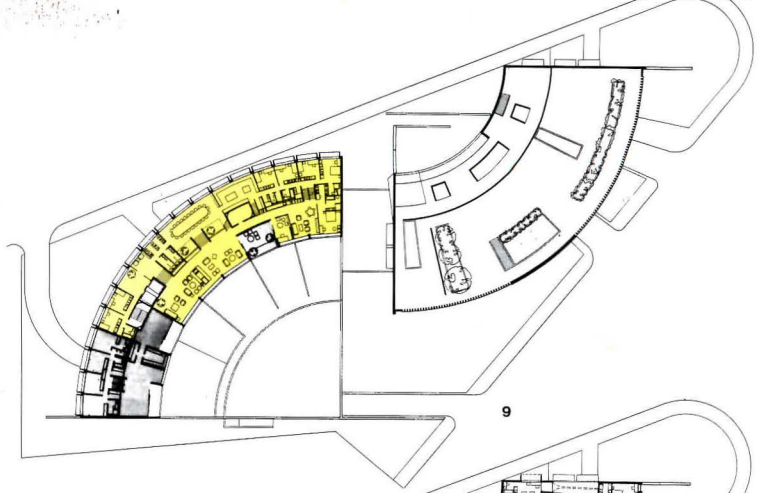
What is familiar? Seidler has assimilated, as few architects have, Breuer's sparing but eloquent expression of surfaces, volumes, links, and of their composition and texture — indeed, for Breuer, these have always been sensory, not just structural, challenges.

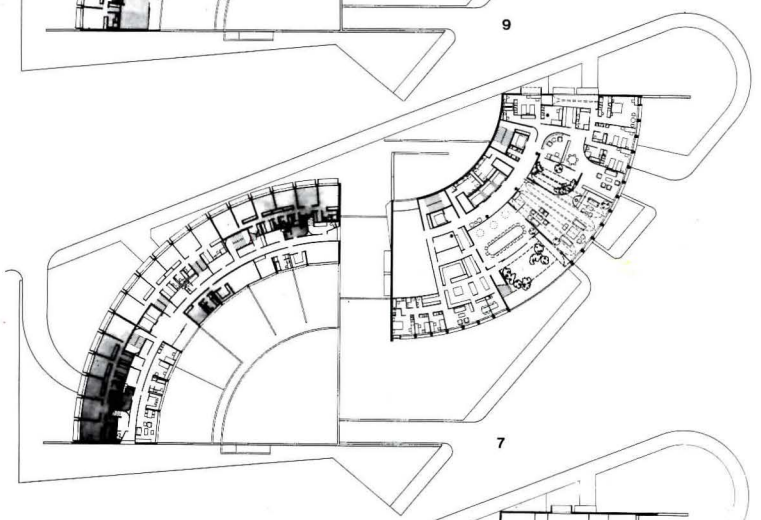
The end walls of the embassy buildings, finished with grey Limoge granite, are an example, especially those of the apartment house, which have deep, shadowy indentations — and those of the chancellery, which have precast-concrete cowls, out from under which deep, shadowy windows peek. This dimension of depth is interpreted repeatedly — the recesses denoting balconies there, terraces there — and this depth picks up with spritely cadence on the north-facing curved facade of the chancellery and the two curving facades of the apartment house. These are composed of precast elements, in several different configurations, manufactured in Belgium, and are exquisite as to detailing, texture, and fit. What makes them truly exquisite, though, is that they reflect much more than a concern for material perfection and methodical process. The three precast facades (if only Baron Haussmann had had such precast) express variations on an otherwise continuous, uniform structural theme (evocative of Haussmann's own predilections for order), in effect heightening the genial sense of tension that has been set up by the facades as they sweep around in their concave-and-convex opposition.

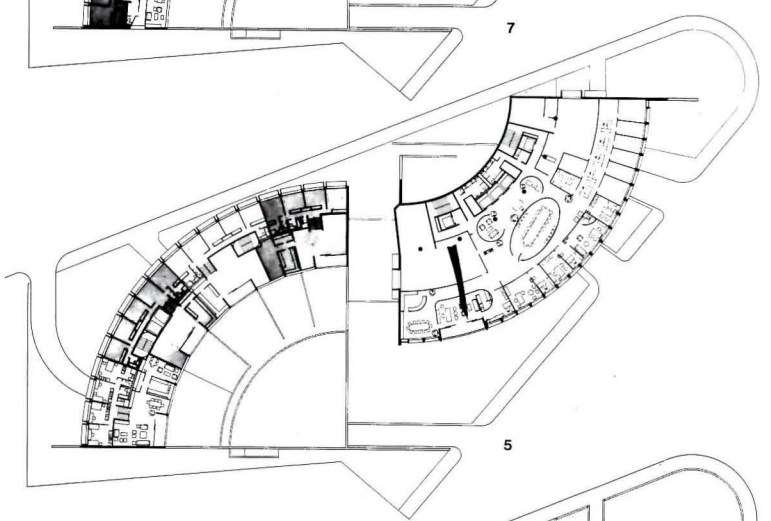
The more expansive south sweep of the apartment house is arrayed with lots of precast-concrete cowls, projecting out from the bedroom windows like a choir of monks. Now and again, the cowls come off, and balconied recesses punctuate the progression. Its more compressed northerly curve has a different set of precast elements, uniform within themselves, but again, there is interplay between recesses and wall surfaces flush with the flow of the facade. The south sweep of the chancellery is, like its projecting end walls, clad with the Limoge, but its northerly exposure, out toward the Eiffel, is made up of still another precast unit, the variations here coming in the subtle adjustment of the height of the windows and, at three different points, on three different levels, in the location of big, stately balconies.

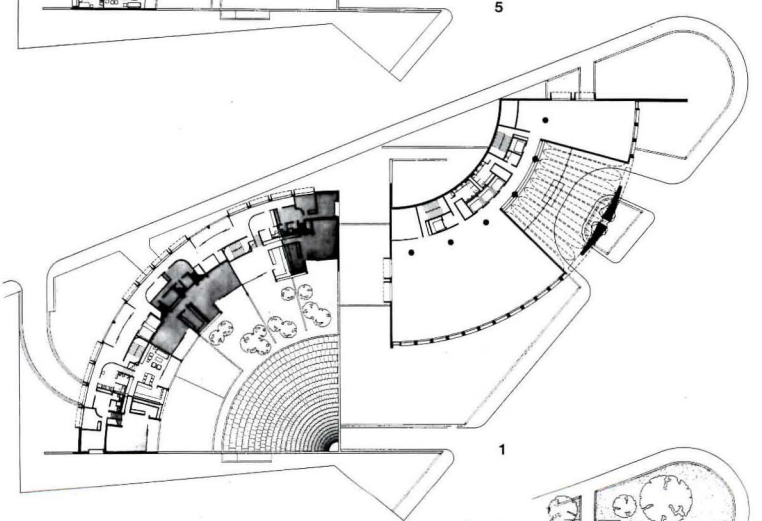
Of moment, with respect to artful engineering, are the contributions of Nervi. These are other reasons that the embassy seems "somehow familiar." At the formal entrance to the chancellery, being a grand *porte-cochere* under the building and rising two levels, is a graceful board-formed pylon, supporting the curved structure above, its lines splaying out and up in hyperbolic surfaces with as much flourish as pure function allows — no more, but in Nervi's way, always just enough.

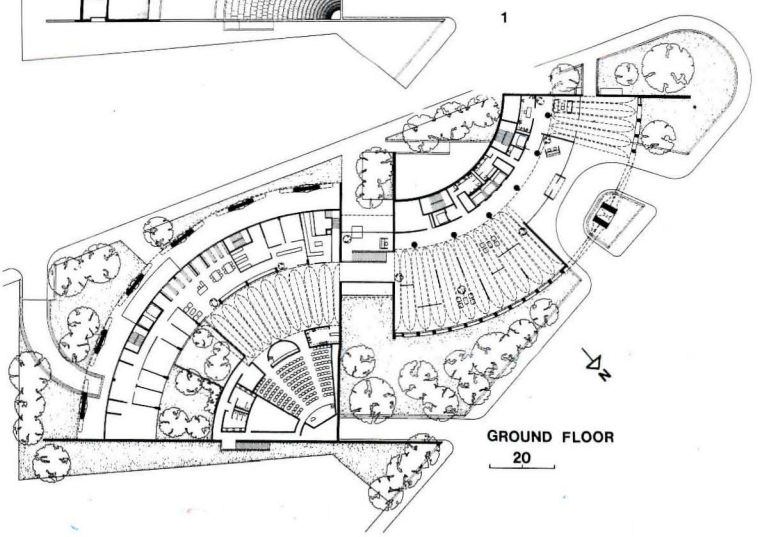
The plans of the Embassy point up how the quadrant of the chancellery, to the right of each plan, relates to that of the apartment house, to the left of each. The more public and ceremonial areas are on the ground level of both buildings — an exhibition hall in the chancellery, a multi-purpose hall and auditoria in the apartment house. There are 34 apartments arrayed around the arc on the nine floors above, culminating with a top-floor suite for one of the ambassadors (near left, opposite left, and below). All these apartments are split-level. On the topmost, or seventh, floor of the chancellery, what with its various offices, meeting rooms, and reception areas on the intervening levels, there is a second ambassadorial suite (opposite top, opposite bottom, above, and overleaf). This is all on one level, extending out to a terrace.

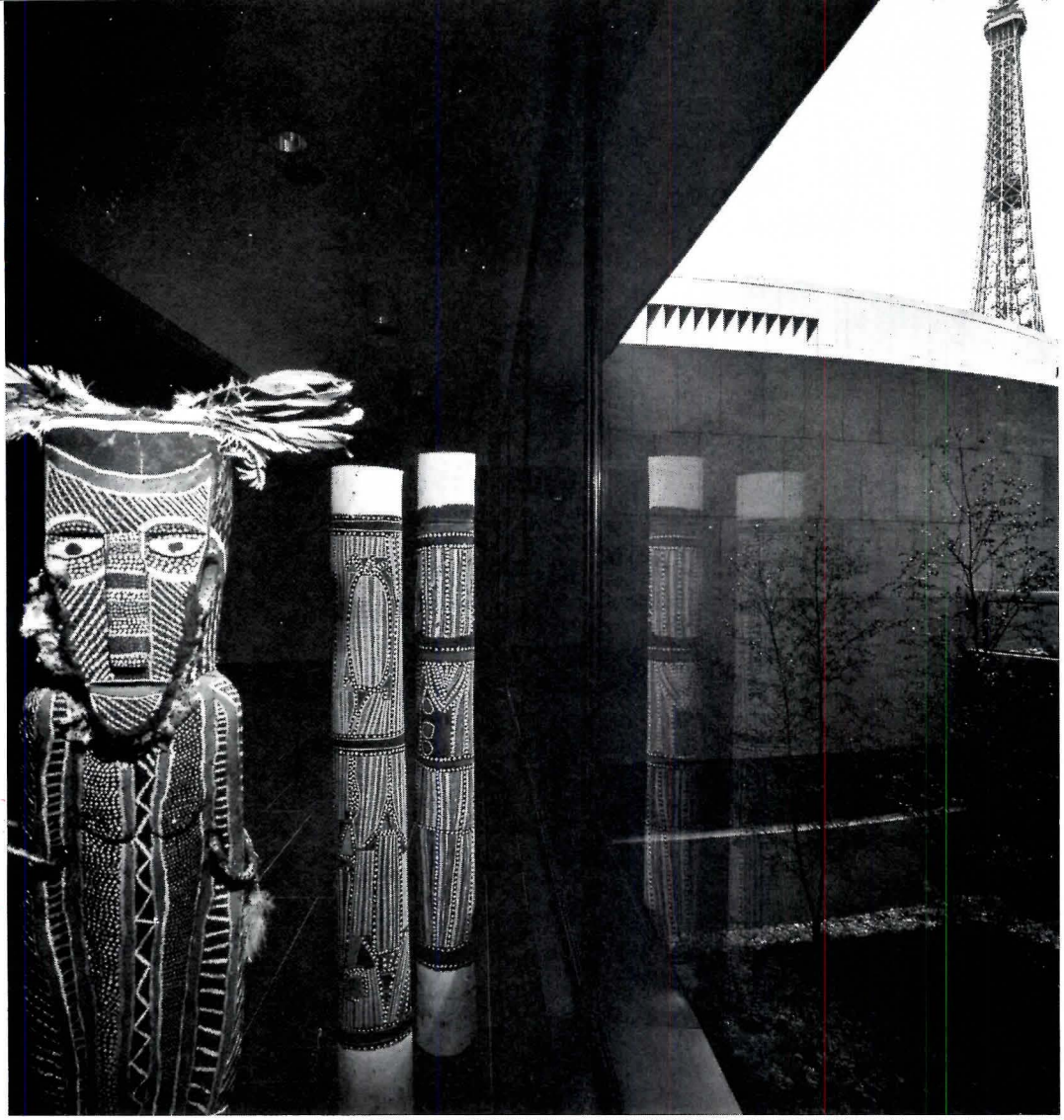


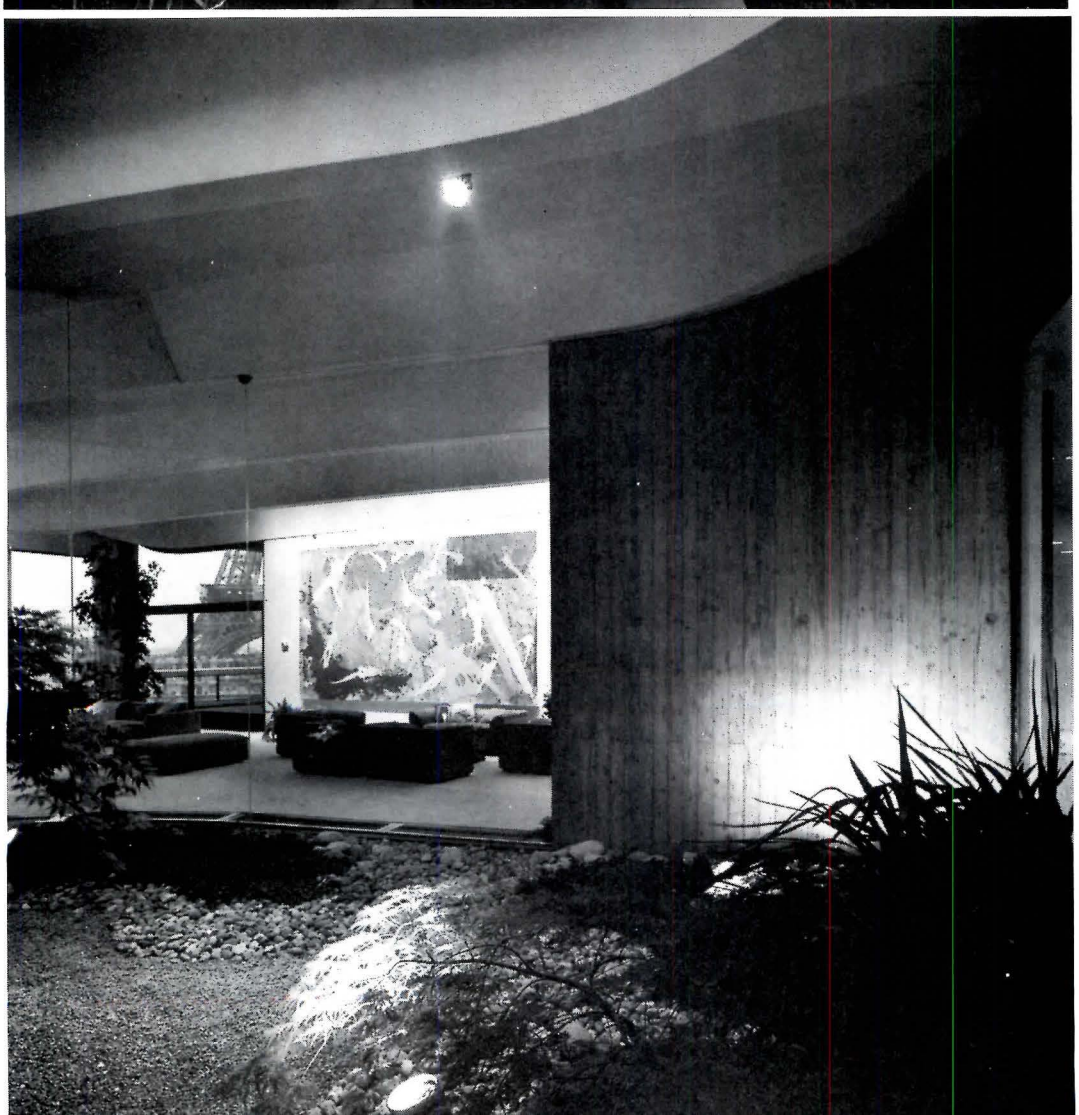












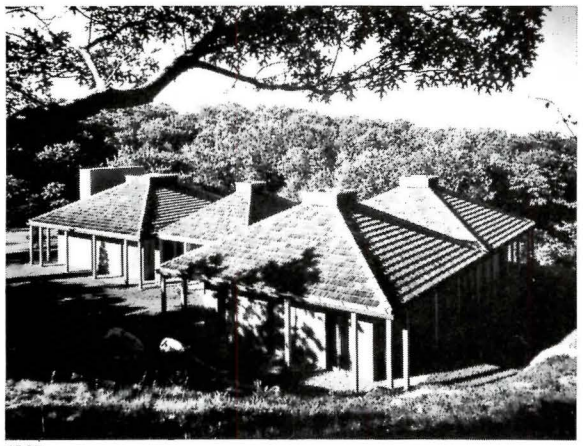
In the case of the apartment house, there are six smaller similarly tapered haunches which, working with the loadbearing precast elements up above, work out the eccentricities of load coming down into the piers. Behind these haunches is a pleasant arcade, running along the building.

Then there is something else familiar about this place — at least for those who know Seidler's work in Australia, most dramatically his office across the harbor from Sydney, or the Trade Group Offices in Canberra. Down there, as here, in the chancellery section of the embassy, he has used precast-concrete T-beams. In Paris, these span 53 feet, allowing great spatial flexibility. And they are so innately elegant, integrating mechanical and lighting runs with their graceful structural shape that these beams form the exposed, finished ceilings of the chancellery's public areas, on the main level, and of the delightful ambassadorial digs on the seventh floor. These T-beams, far from being a mundane cause for comment, show Seidler's propensity for sticking with a good idea.

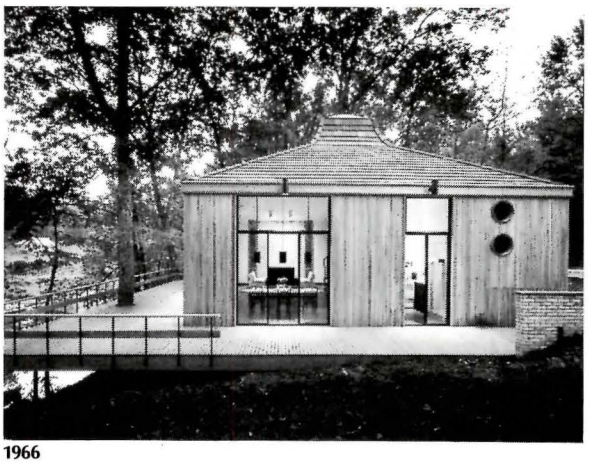
Whereas the official, public, and myriad office requirements of the chancellery determined a certain balancing out of ceremony, amenity, and plain slogging shirt-sleeved spaces, the planning of the apartment house, with its 34 apartments, demanded much more specificity and intricacy. The result is a split-level arrangement, in terms of both the shared galleries (there are four of these, two and a half floors apart) giving access to the apartments and circulation within the apartments, which range from one to five bedrooms in size. One takes a half flight of stairs up to, or down from, these galleries to the apartment entrances; inside the apartments, one takes another half flight between the living and bedroom sections. It is all quite convenient, easy on the feet, even fun — and the balconies, from the landscaped patch of privacy for a second ambassadorial suite on the ninth floor to the railed recesses of the smaller units, let out to the city.

Harry Seidler has created, listening to the conscience of his adopted country as well as to those he has learned from over the years, a truly *international* work — but without the coolness of what has passed for the International Style in recent times. Without emblematic kangeroos and koalas, he has expressed the plain-spoken, handsome, energetic character of a country that is very much in the world — certainly now very much at home in a city which became "international" precisely because its unique majesty and magic have been kept intact. *That* is a fitting building. — *William Marlin*

AUSTRALIAN EMBASSY, Paris. Architect: *Harry Seidler & Associates—principal, Harry Seidler; associate Peter Hirst.* Consultant and Architect d'Operation: *Marcel Breuer; associate, Mario Jossa.* Engineers: *Cabinet Bancon (structural); Cabinet Trouvin (mechanical, electrical, hydraulic).* Consultants: *Claude Engle (lighting); Charles Sevigny (interior design); Bruce MacKenzie (landscape design).* Quantity Surveyor: *Cabinet Merlin.* Contractor: *Oger.*

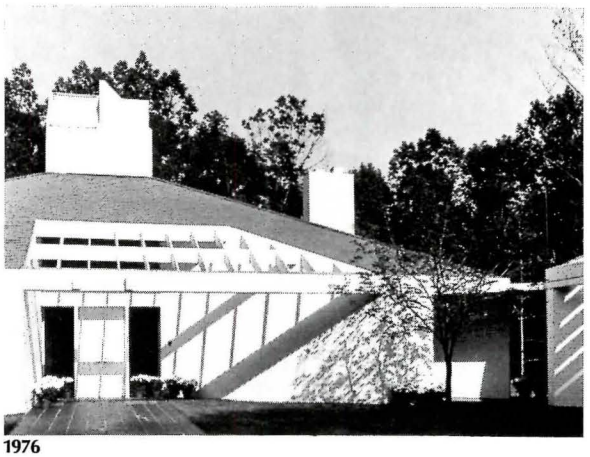


1965



1966

1971



1976

1977

1978

His search for a broadening design expression leads Hugh Newell Jacobsen to the forms of the past

Any number of Hugh Jacobsen's houses may be familiar to readers. More than a dozen (sampling above) have appeared in these pages over the years and all bear the stamp of a personal style evolved over a decade and a half by an architect who loves houses and cares enormously how they look and function. Jacobsen's newest design (on the following six pages) continue to reflect these

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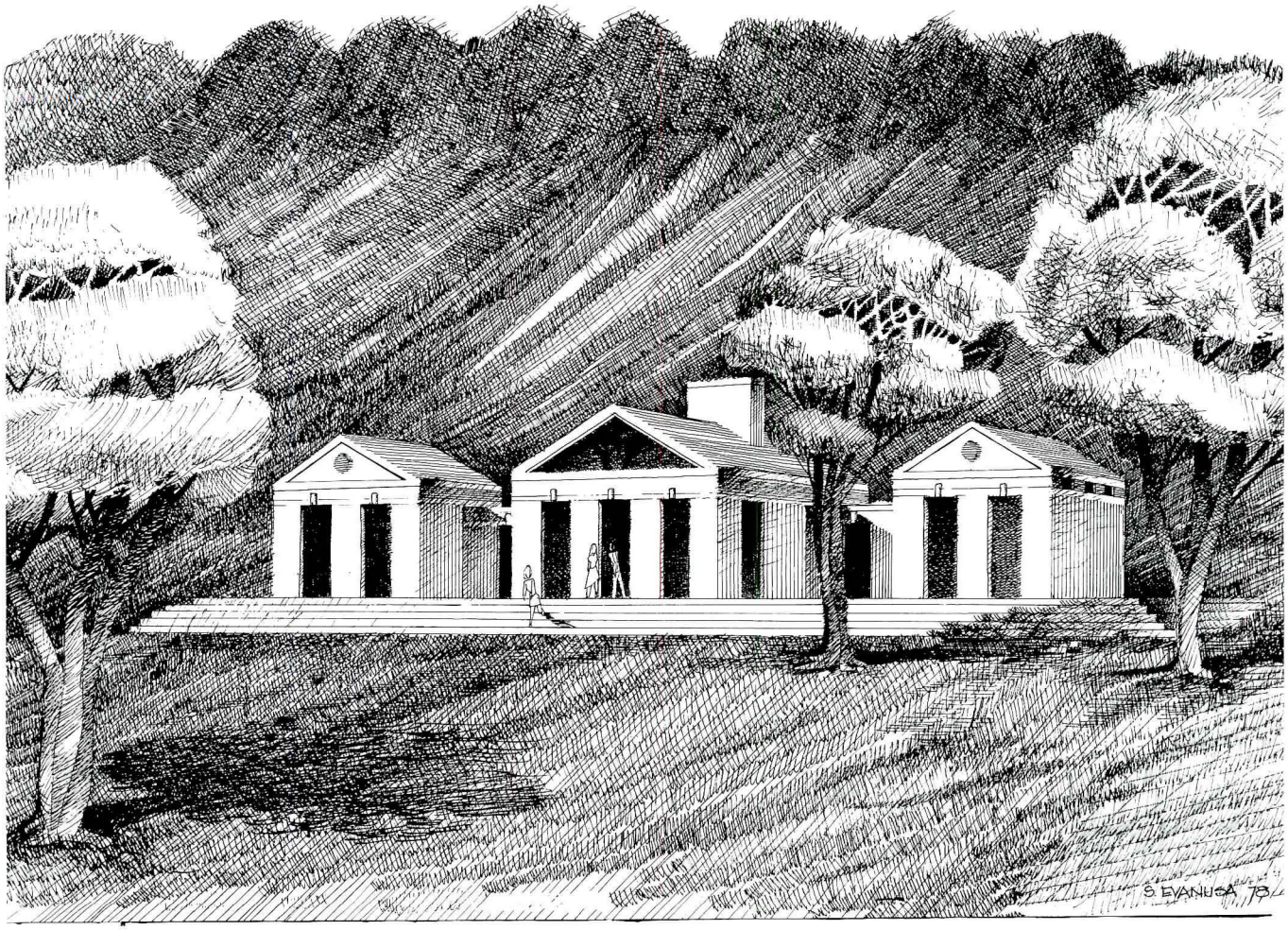
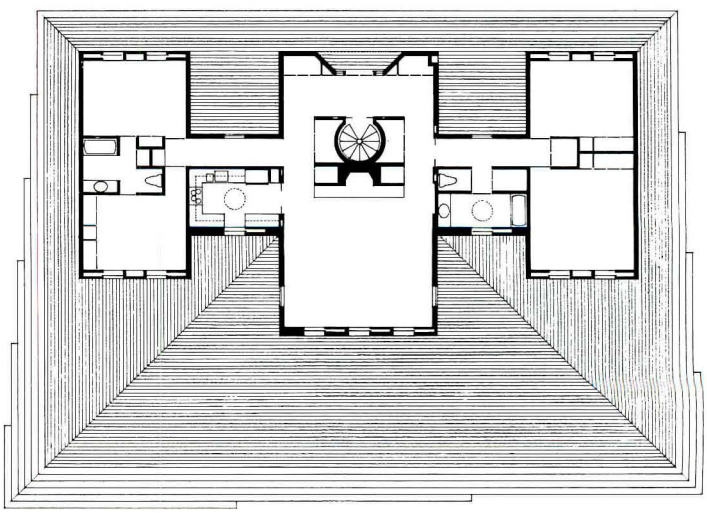
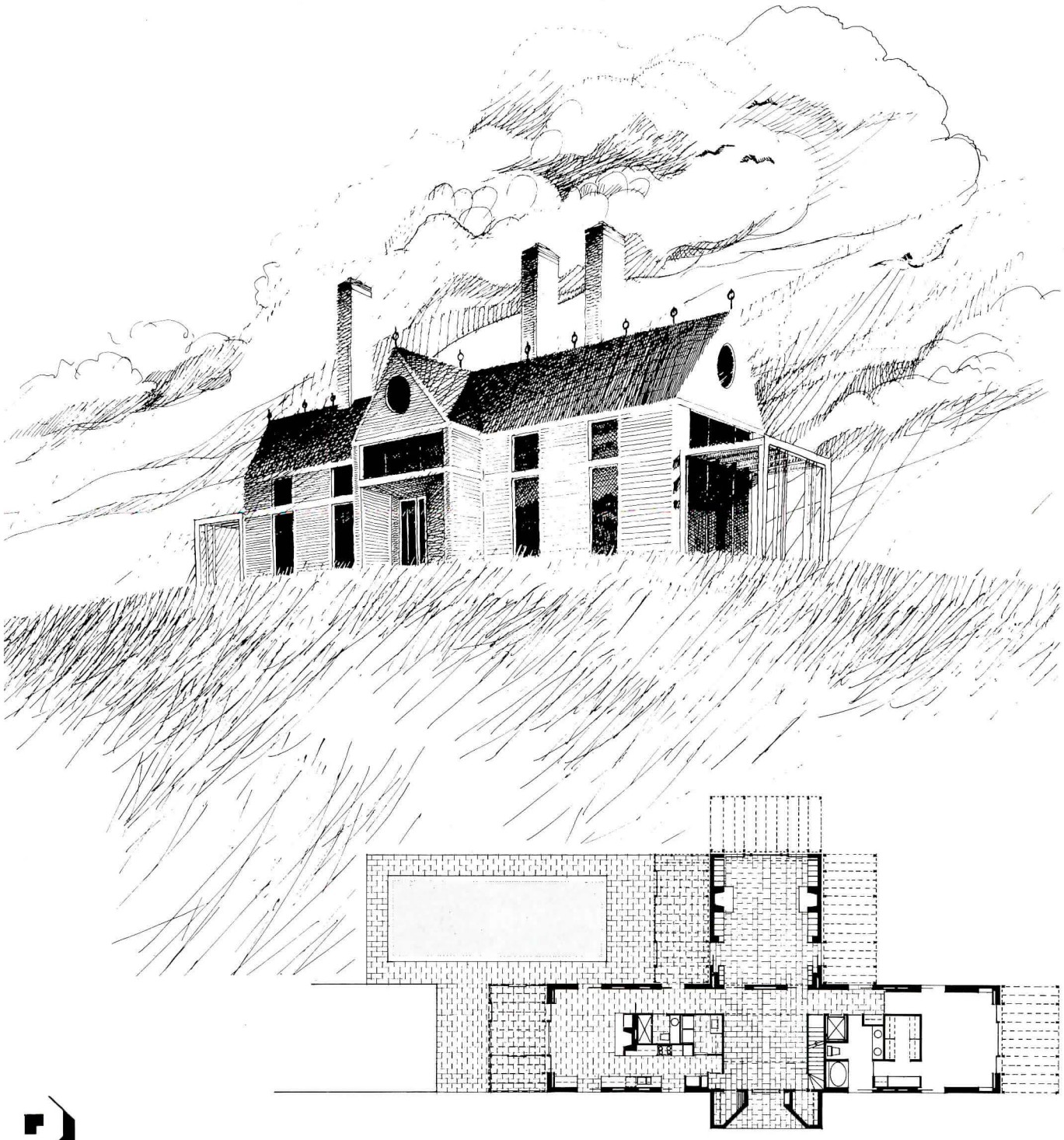


SUMMER HOUSE, DARIEN, CONNECTICUT

The decision to reawaken Greek Revival from its century-long slumber and to employ its forms in this contemporary Connecticut house is a response—and an unexpected one—to a particular set of site conditions. The house sits on the flank of a tall hill overlooking Long Island Sound. Against the green backdrop of the hill, a hill with houses of several traditional styles all dominated by a Beaux Arts "grandfather house," the Palladian outline is whimsical and abstract. To sailors on the Sound, the alternating strips of flat wall and window are designed to read like circular column and portico. The house and its neighbors make a kind of historical picture gallery. The formal plan and its balanced arrangement of spaces is designed so that the house can absorb numbers of summer guests while retaining maximum privacy.

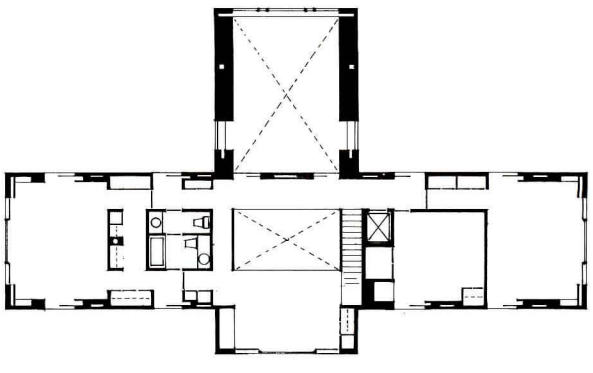


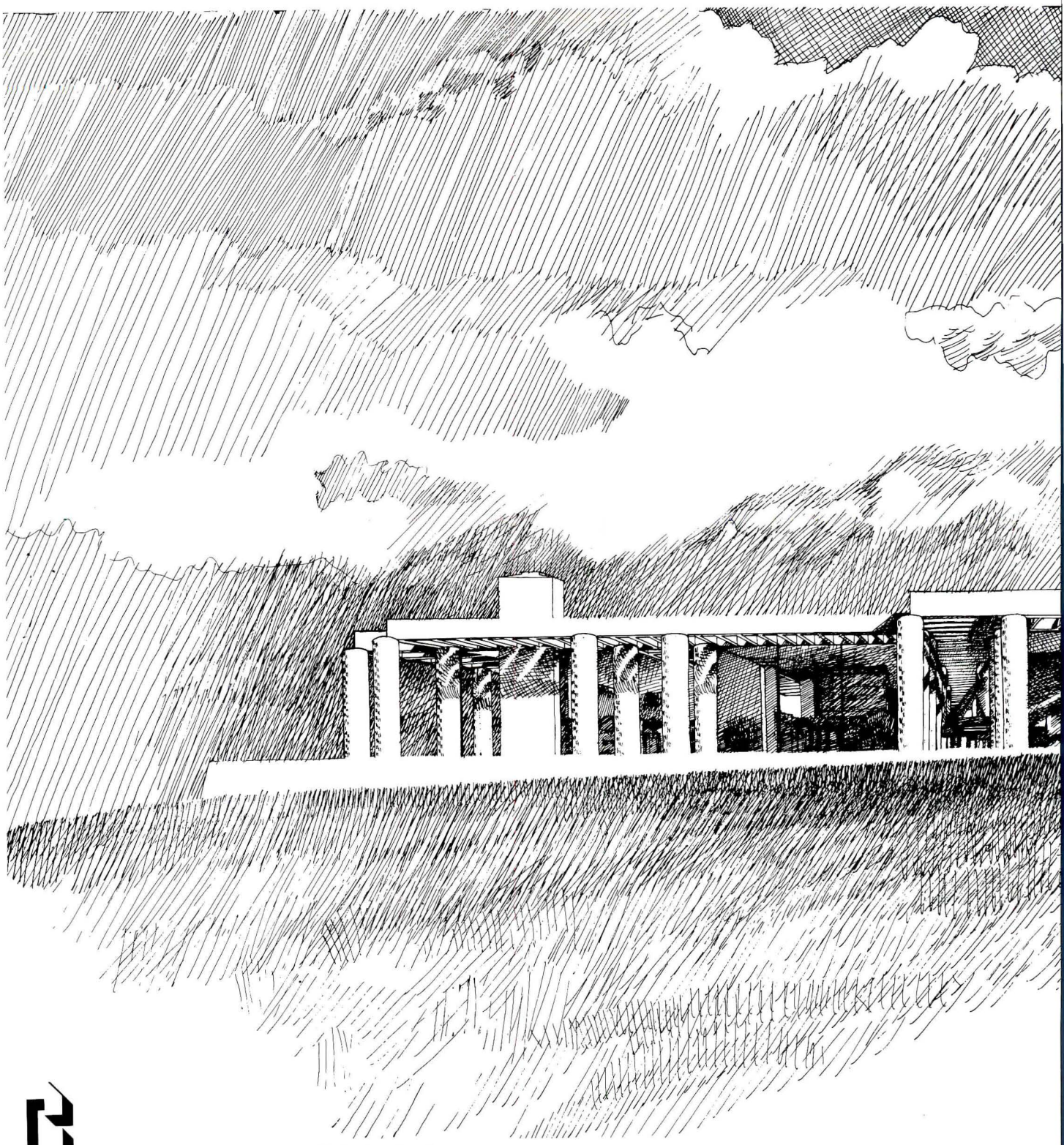
All renderings by Steve Evanusa



REVIVALIST ABSTRACT IN EASTERN MARYLAND

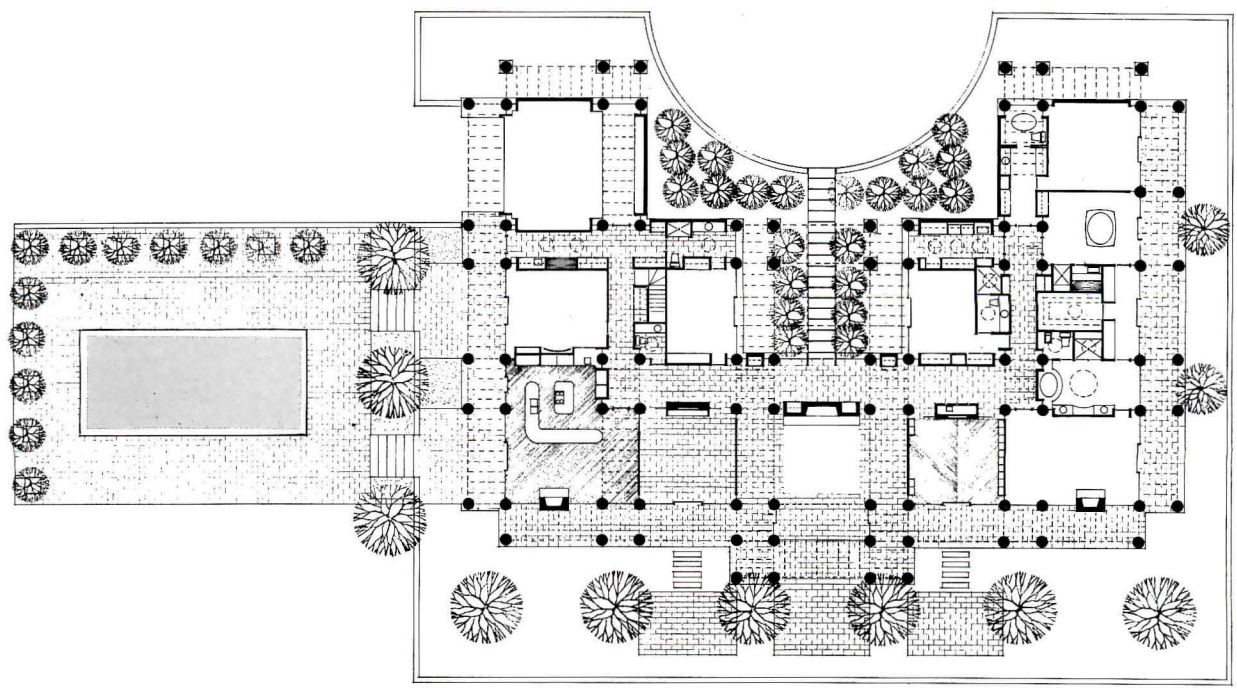
The tall massing, the towering chimneys, the lightning rods, the white clapboard all combine to recall the Gothic Revival houses that dot Maryland's Eastern Shore. Sited on a hilltop, the house is the termination of 2000-foot-long axis in the form of an allee. This carefully managed uphill vista silhouettes the house against the sky, heightening its picturesque and emotional qualities. The biaxial plan produces a large foyer that becomes the distribution point for all circulation and a symmetrical arrangement of spaces that, in less skilled hands, has often proved tyrannical in the past.

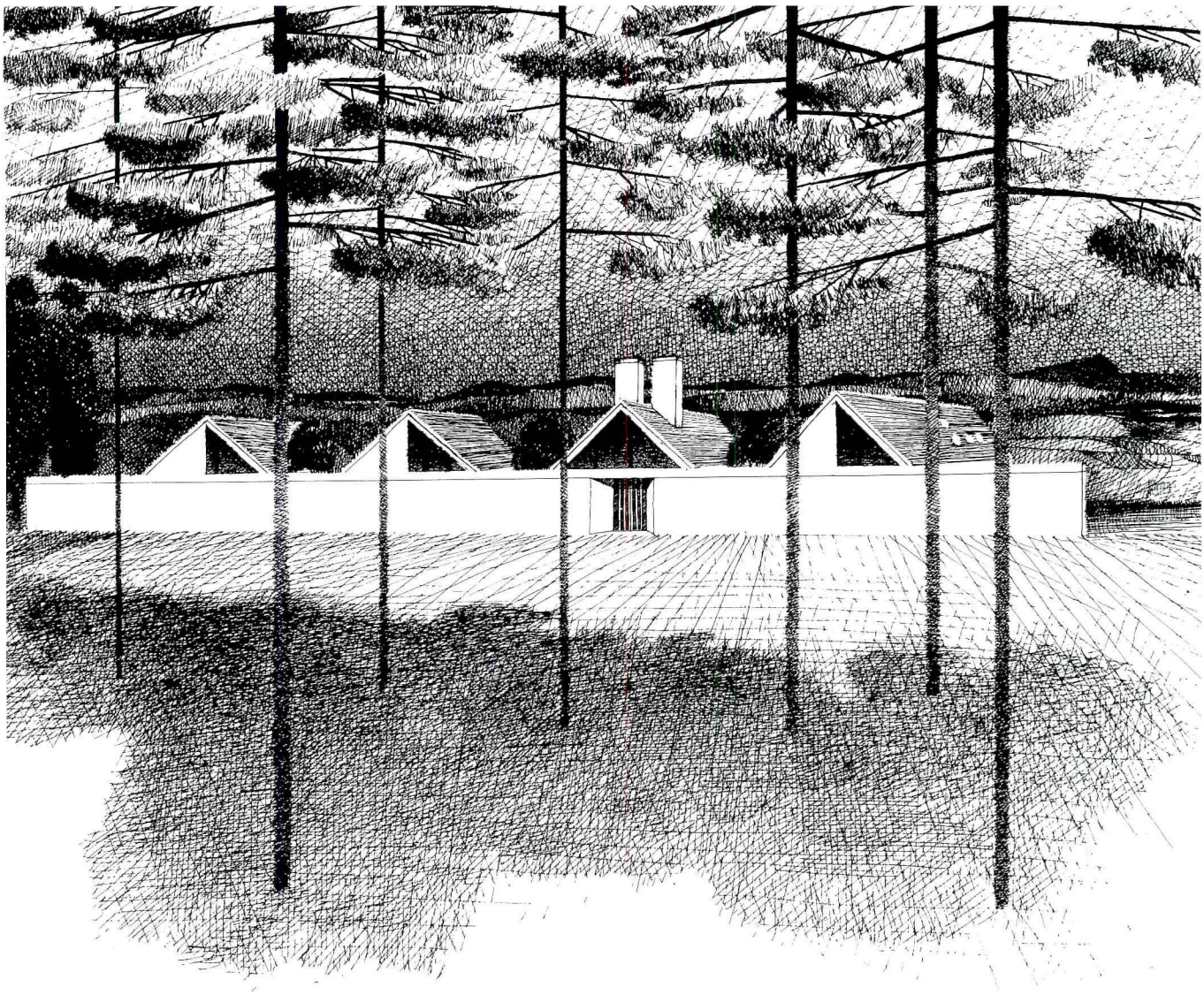




COLUMNED PAVILION, LEXINGTON, KENTUCKY

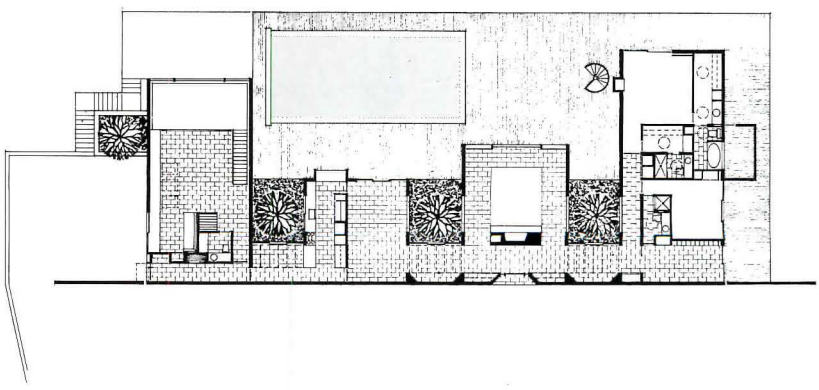
The program called for a large house sited on top of a gentle, bluegrass crown at the center of the owner's 1000-acre horse farm. The design is a conscious effort to recall a low garden pergola that might belong to almost any time or place. Eighty-eight freestanding columns in clusters of four structure the plan. Thin strips of mirror glass separate round column from partitions, visually detaching the two and keeping the column "round." The skin of the house is nearly all double glazing protected with eight-foot trellis overhangs on all sides. The pattern of shadow cast by the trellis is lively and abstracted as it bends around columns and stripes floors. The trellis detail will be repeated inside to form skylights over the corridors and the living room. The whole composition is brought to rest on a broad podium. Because the geometry of the hilltop is nearly perfect, the podium is three feet high at its corners and all but disappears at its centerpoints.

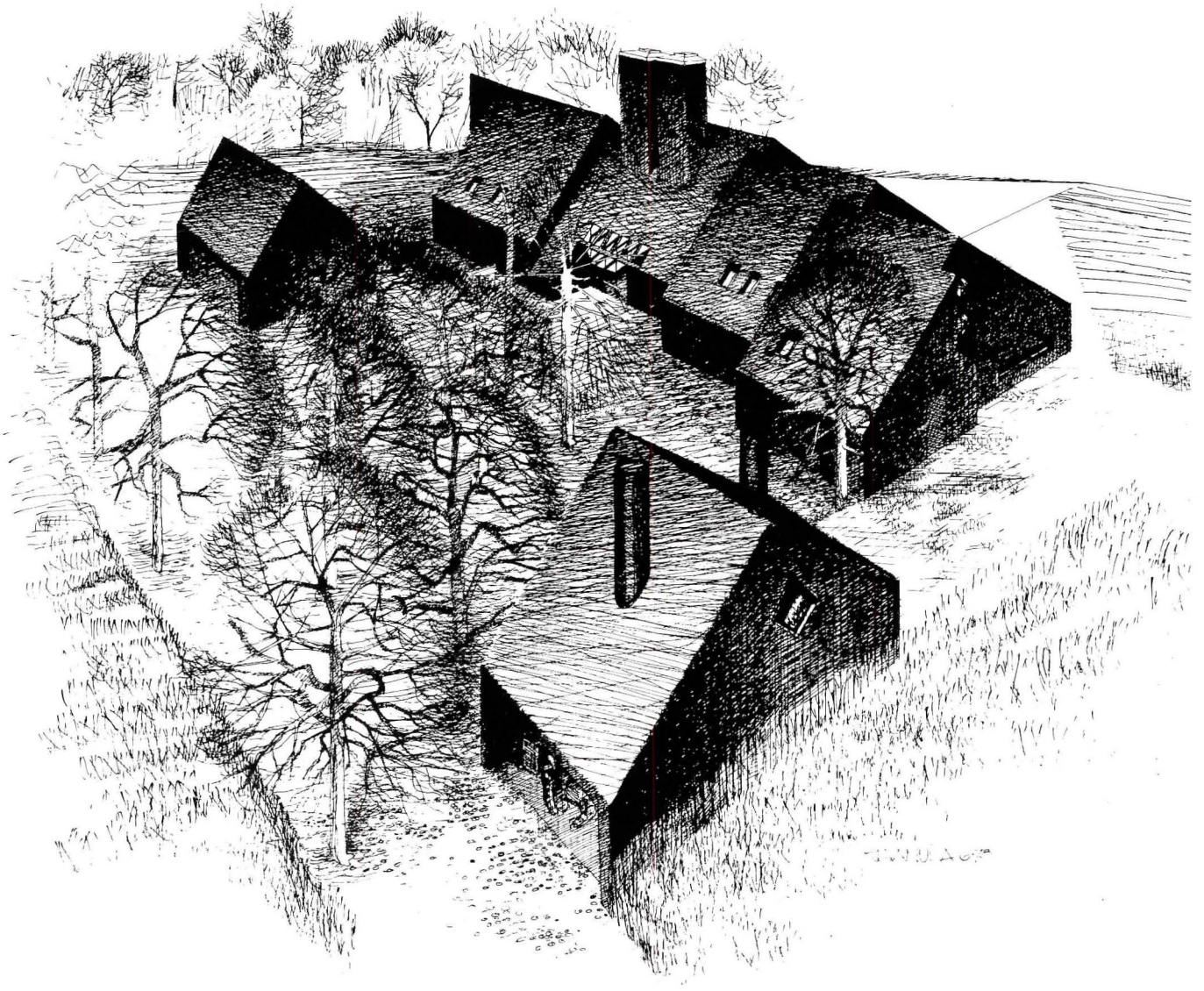




WALL HOUSE, SELINS GROVE, PENNSYLVANIA

On a more or less typical suburban street in a neighborhood of ranch houses, Jacobsen has drawn all the components of this house up against a continuous wall that is differentiated only with a cutout at the front door. The roof line hints at the four pavilions beyond at the same time that it reflects and abstracts the street scale. From left to right (see plan) are pavilions containing 1) artist studio, 2) dining/kitchen 3) living room 4) library/bedroom. Each is enclosed under a roof of identical height and pitch though the length of each element varies. Small landscaped courts will buffer the functions and all will be linked by a skylighted gallery that will house the owner's rather extensive collection of American art. The theme of older row houses is present but ranch house images, with their glazed gables, are also present and seem to predominate.

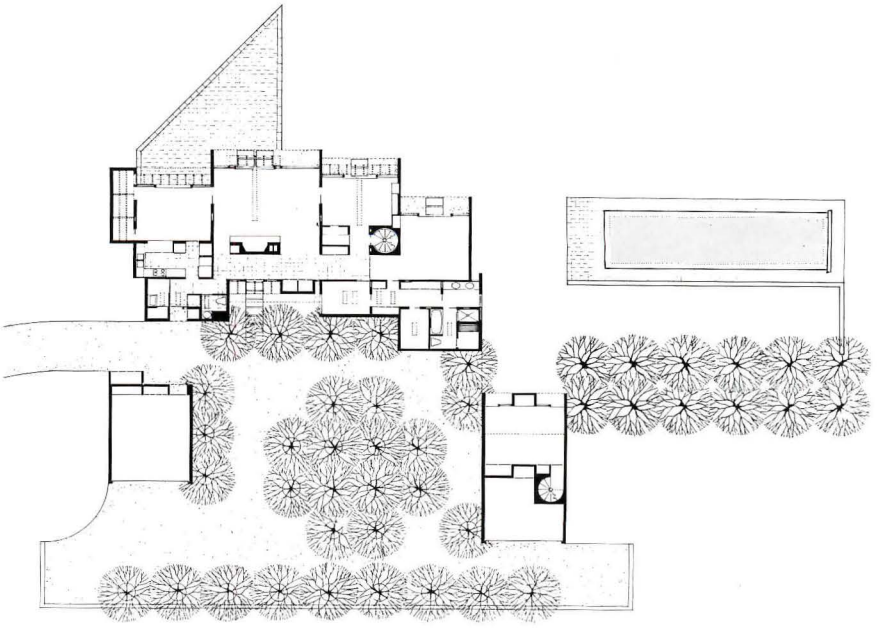




SIX BLACK BARNS, WAYZETA, MINNESOTA

Sited in the center of a 20-acre meadow of field flowers, this house will overlook a large lake. The barn forms are clustered to form a forecourt that is reached through a narrow opening between buildings. European linden trees are grouped to form a turning circle in the gravel forecourt and to provide screening elsewhere. These trees furnish a powerful green contrast to the black structures and black retaining wall that encloses the court.

Though Jacobsen has consciously employed the vernacular forms of the region, the plan of the main structure is reminiscent of several of his earlier houses. Rooms are lined up against the view with their glass walls offset to break up the elevation. The major spaces are linked by a long circulation gallery with a circular stair at one end. The interiors will be backlighted, high-ceilinged, carefully detailed and essentially white.



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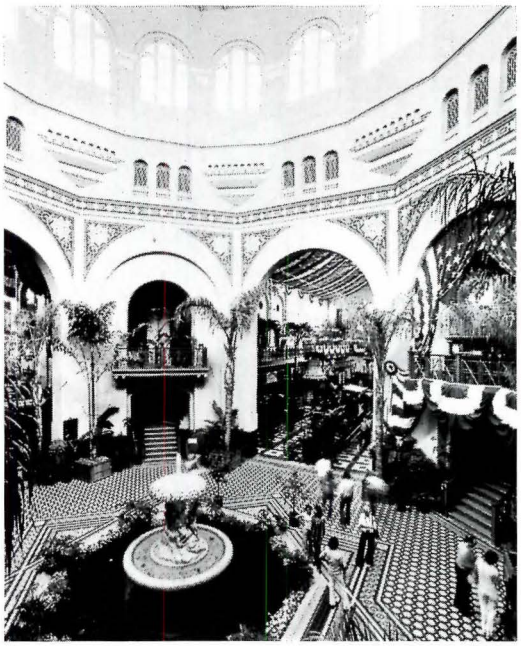
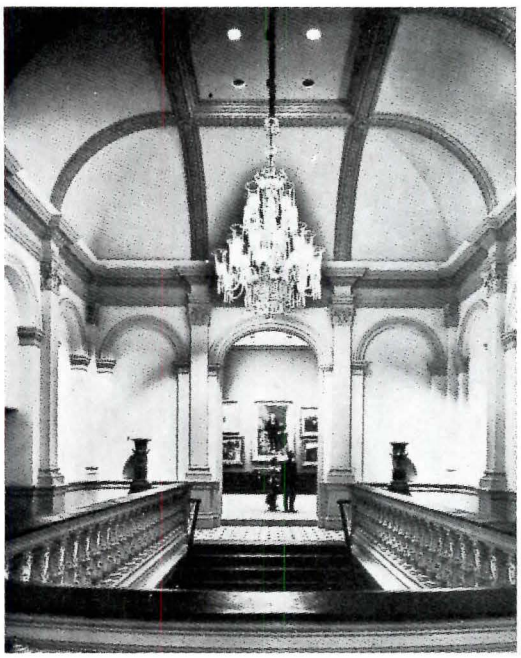
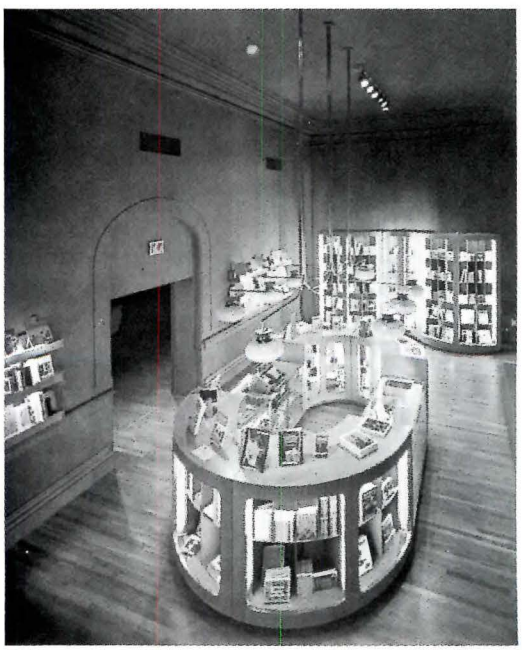
concerns with an intensity undiminished. But, as the reader will see, a conscious historicism has started to temper Jacobsen's interests, giving each of the five projects shown here strong links to architecture's past. Sometimes the links are rather specific—to Greek or Gothic Revival forms, but in other cases, the references are more general, recalling the vernacular farm and residential buildings that have long dotted the American landscape. In either case, it is important to note that the historical quotes are never exact. Jacobsen does not intend that they should be. Nor are they belligerent assertions of anti-Modernism, for Jacobsen seldom thinks in these terms. What they do reflect is the intuitive and widely felt desire to broaden design choices and, at the same time, to produce a product that fits among its neighbors more amiably and unobtrusively. If these projects do not say 1965, 1978 or even 1985 very aggressively, they nevertheless belong to the contemporary idiom in every functional sense.

Whether Jacobsen was brought to these interests by some "inner clock," by renovations to landmark buildings at the Smithsonian, or by some other avenue entirely, is not clear and probably matters little. What does matter is that he works with care and thought. And in spite of their outward differences, these designs are united by many things. Among them are an emphasis on careful siting, a sensitive handling of materials and an important element of wit that threads its way through each project, surfacing sometimes in a "trompe l'oeil," othertimes in an unexpected shape or detail but always in ways that tease a smile.

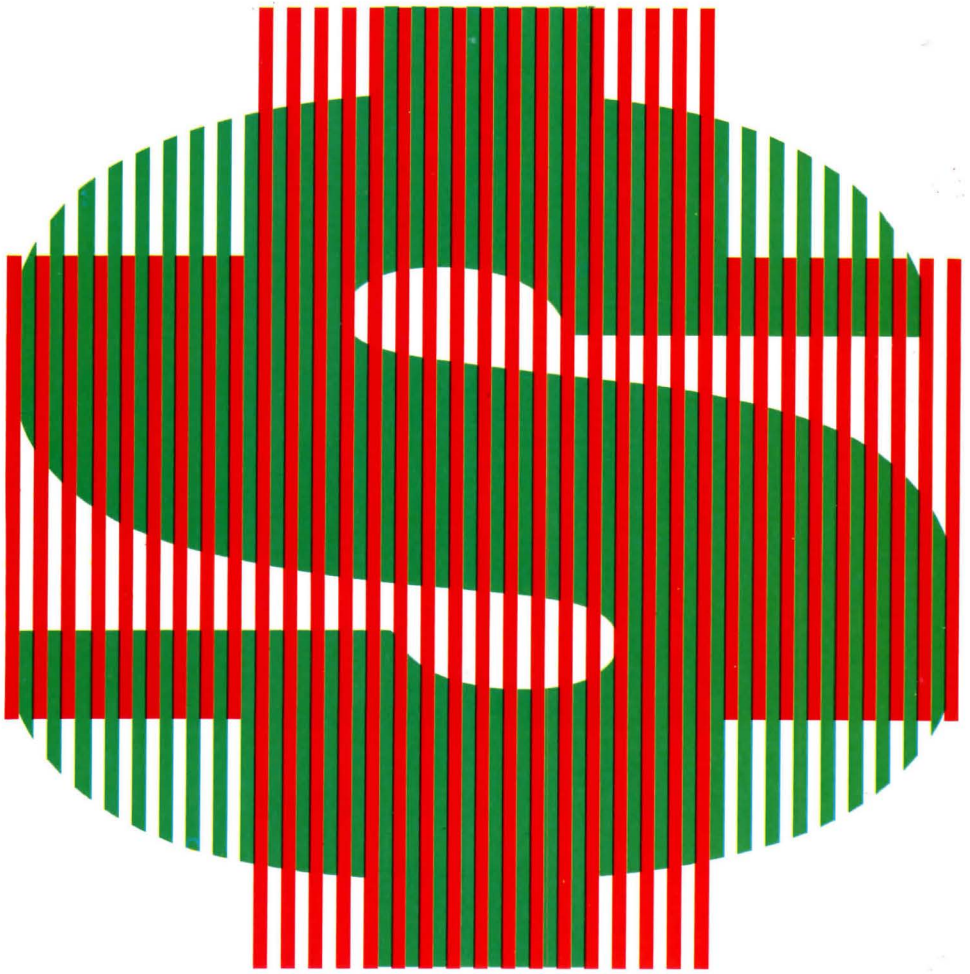
That is an element that many observers have found missing in modern design for a long time.







1972 Smithsonian Institute
1973 Smithsonian Institute
1975 Smithsonian Institute



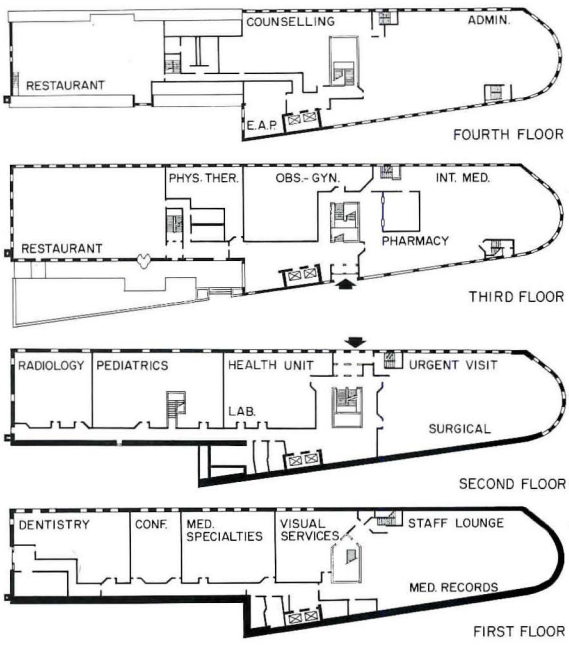
Graphic design by Michael Jordan

EXISTING STRUCTURES OFFER HELPING HANDS TO HEALTH CARE

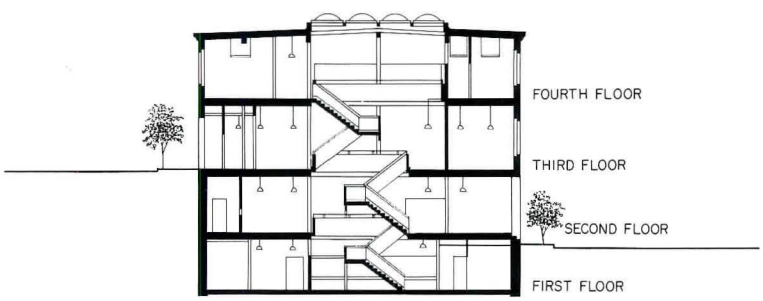
Existing health-care facilities are always being changed around—recyclings, remodellings, renovations, brand-new additions. It has to be. This is a period of rising health-care and construction costs, as well as of expanding demand for service. America can no longer afford the assumption that a big new hospital, designed and built from scratch, is the only respectable, ample receptacle for medical progress; it can't even afford the assumption—very old-fashioned by this time—*that buildings originally* built for non-medical purposes aren't susceptible to changes that would in turn transform them into places of healing. The *thing is, though,* that very little research has been done on the increasingly common practice of making over existing buildings, whether originally built as health-care facilities or not. So a "Health Facility Reuse Conference" was held earlier this year, meant to spur and sustain such research. It was formulated by the Program in Health Services Planning, of the Graduate School of Architecture, at Columbia University, and it was supported by a grant from the National Center for Health Services Research, of the Department of Health, Education, and Welfare. This conference, a "first," included a Design Awards Program, also a "first." What follows is an anatomy of a vital trend, illustrated with nine especially skilled designs.

Photos Kaye photos

DOWN BY THE NEW MILL STREAM, A WHOLESOME SETTING



Mossassuck Square Arcade, built as a mill in Providence, Rhode Island, in 1870, has been restored and adapted by architects Steffian-Bradley to house 48,000 square feet of health-maintenance activity for the Rhode Island Group Health Association. The job includes a multi-level restaurant and an open-air parking structure. A commitment to preventive medicine has thus been translated into a work that reinforces the fabric of a historic district. A furniture store and warehouse until 1973 (above), the building has been skillfully restored on the exterior (opposite, top). The pitched roof half of the structure (opposite, bottom, and overleaf), houses the restaurant. The original 12-by-12-foot double-hung windows were replaced with single-fixed solar-grey glass.



Making the most of existing structures, by making them over to meet new, changing, or expanding health-care needs, can reduce the amount of capital required for health-care facilities, which also means reducing the over-all cost of delivering the panoply of support and service that American society has every reason to expect. This is especially so when the cost of keeping well, or of getting well, is going "out of sight"—almost as much so as those benign knowing codgers, with their little black bags, who would think nothing of making house calls in the middle of the night.

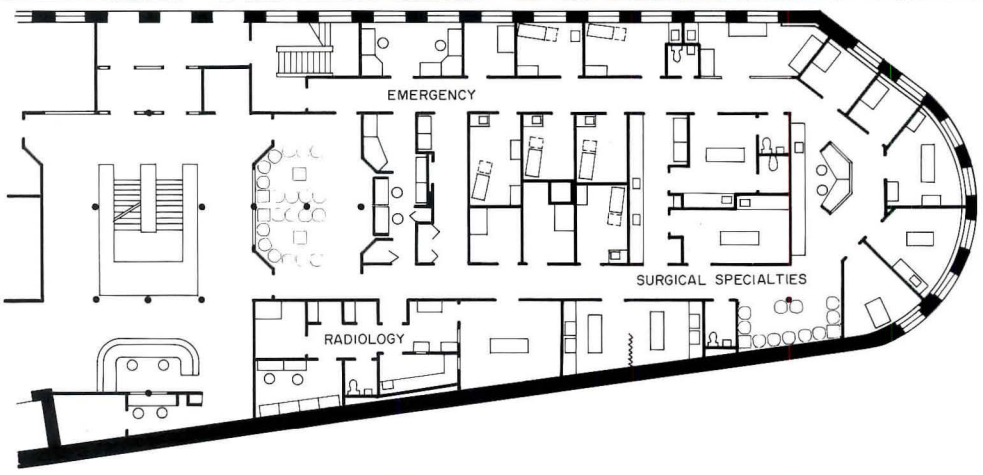
Doctoring existing structures is a design option that dawned for many other building types some years ago; but only now is it becoming one of the most, if not the most, ubiquitous option being pursued by architects and the complex health-care "client."

The "Health Facility Reuse Conference," held at Columbia University earlier this year, could not have been more timely—and it can be judged a resounding success precisely because it yielded more sincere, probing questions about priorities of policy and research than it did smug "answers" about an area that has scarcely been evaluated in a comprehensive, coordinated way.

Formulated by architect William T. Parker, who is the director of Columbia's Health Services Planning and Design Program, the conference was meant to build a momentum of research and debate, connected to a similarly on-going program of recognizing design excellence within the highly functional, fiscal, and technical

format of health-care delivery. Mr. Parker's co-investigator in this effort was Dr. Steven Jonas, who is associate professor in the Department of Community Medicine, of the Health Sciences Center, at the State University of New York at Stony Brook. Of especial significance, already mentioned, is that the conference was supported by a grant from the National Center for Health Services Research, the staff of which has gone firmly on record in its belief that design excellence and top-notch creativity do indeed have a fundamental, pragmatic, cost-effective role to play in a field of construction that has been known (let's admit it) more for buildings of cold efficiency than for buildings that elevate the spiritual and sensory outlook of the people using them.

The conference was divided into six parts, dealing with six "critical issues": financial feasibility; codes and standards; systems approaches; project implementation; planning strategies; and facility evaluation. The Design Awards Program, linked to the sixth category, dealt with a wide range of facilities, submitted from many parts of the country, in two categories—those completed, and those in the design or construction phase. Within both of these categories were three subdivisions—reuse, retrofit, and reconfiguration; each allowing for three kinds of change—changing a facility from one medical use to another medical use, changing a medical use to a non-medical use, and changing a non-medical use to a medical one. Amid the judging of the designs, there was an unspoken yet

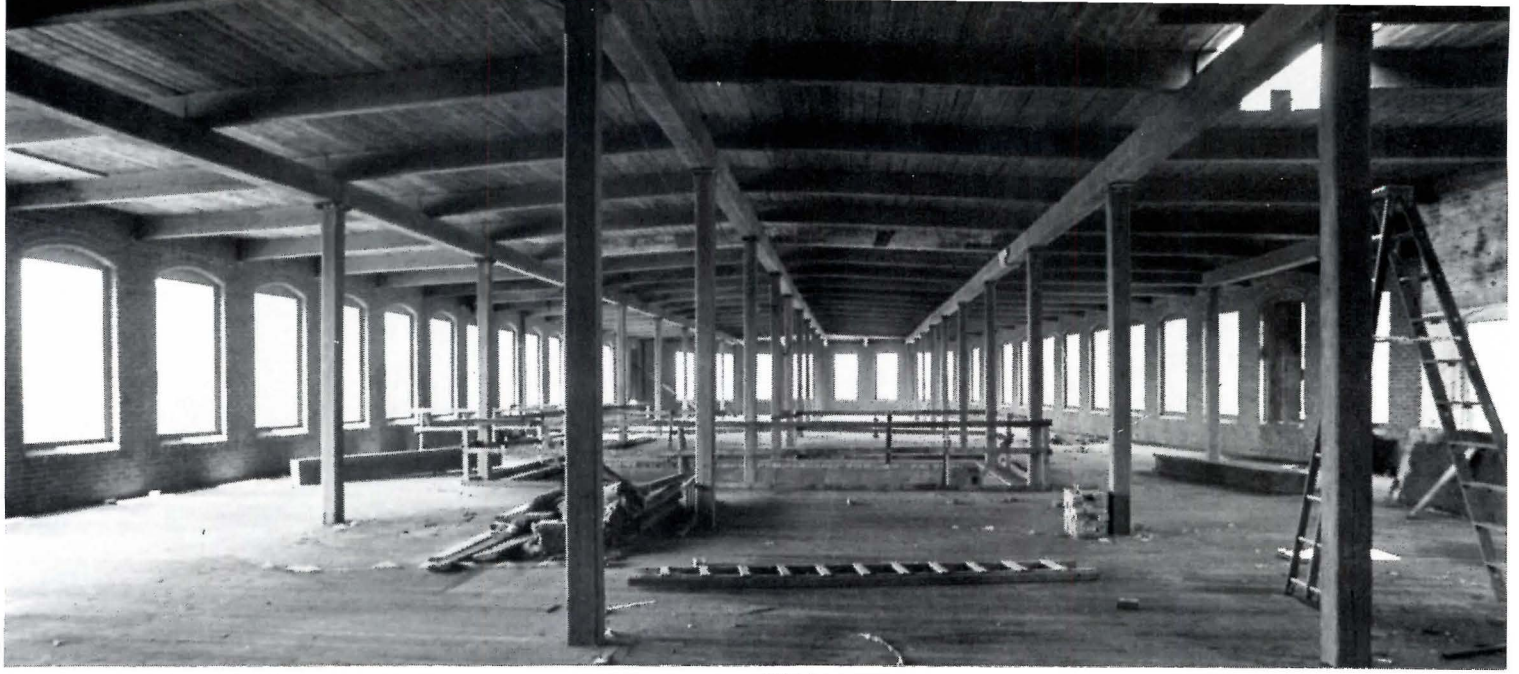


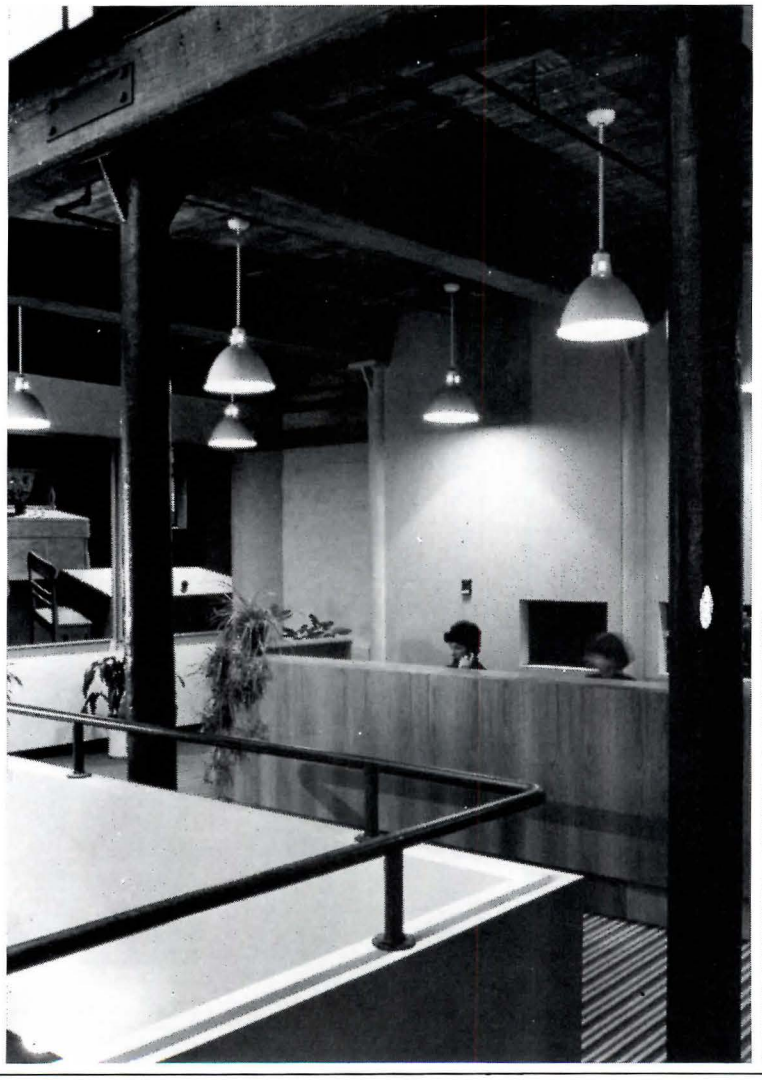
A functional space planning design was developed to work within the original building's system of masonry walls and cast-iron columns. Major medical departments are reached from a central arcade connecting all four levels, and skylit. Completely new lighting, mechanical, and sprinkler systems were installed to provide services equal to new construction requirements. The main reception area (opposite, bottom left) is entered on the second level, by way of a ramp from the street. Upper floors, for treatment, maintain the warmth of the old materials in the smallest examination rooms.

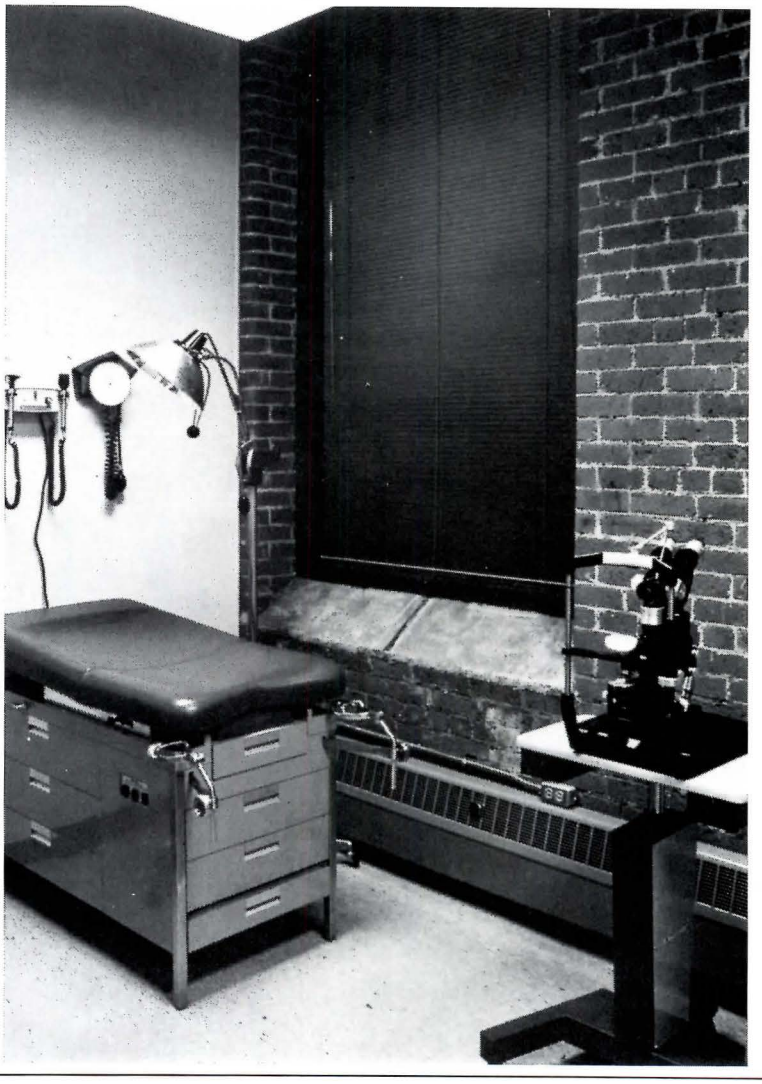
palpable hope that somehow fresh approaches might come to light, along with fresh talent—that evidence would crop up that more design-conscious architects might be putting their skills to work in a field where many such architects have not deigned to tread (and *should*). The fact that there have been so many Quasimodo-style hospital structures is not all the fault of clients who are indifferent to the supportive, sympathetic, and personable qualities that good design can convey within a health-care facility or, for that matter, to its community surroundings.

As architect Micheal L. Bobrow, one of the jurors, was wont to say, knowing his practical stuff as a "hospital architect" to boot, "Those of us who really care about design quality in this field aren't doing enough to get in there, early, when needs are being resolved and bottom lines established, to prove that there *are* quantifiable, cost-effective dividends from design quality; that it's not automatically more expensive; and that it's not something that can be added to a building *after* it's designed."

The other jurors were James S. Polshek, serving as chairman, who is the dean of the Graduate School of Architecture and Planning at Columbia; William Spence Black of the Ritchie Organization; Allen Green of Educational Facilities Laboratories; and William Marlin of ARCHITECTURAL RECORD. The reaction to the Design Awards Program at the conference—whether from "hospital architects," health-care professionals and administrators, or government officials—was







mixed. One must report, alas, that there clearly remains a considerable disdain for design quality as anything more than something that only occurs when "we have more money than we know what to do with, and of course we never do."

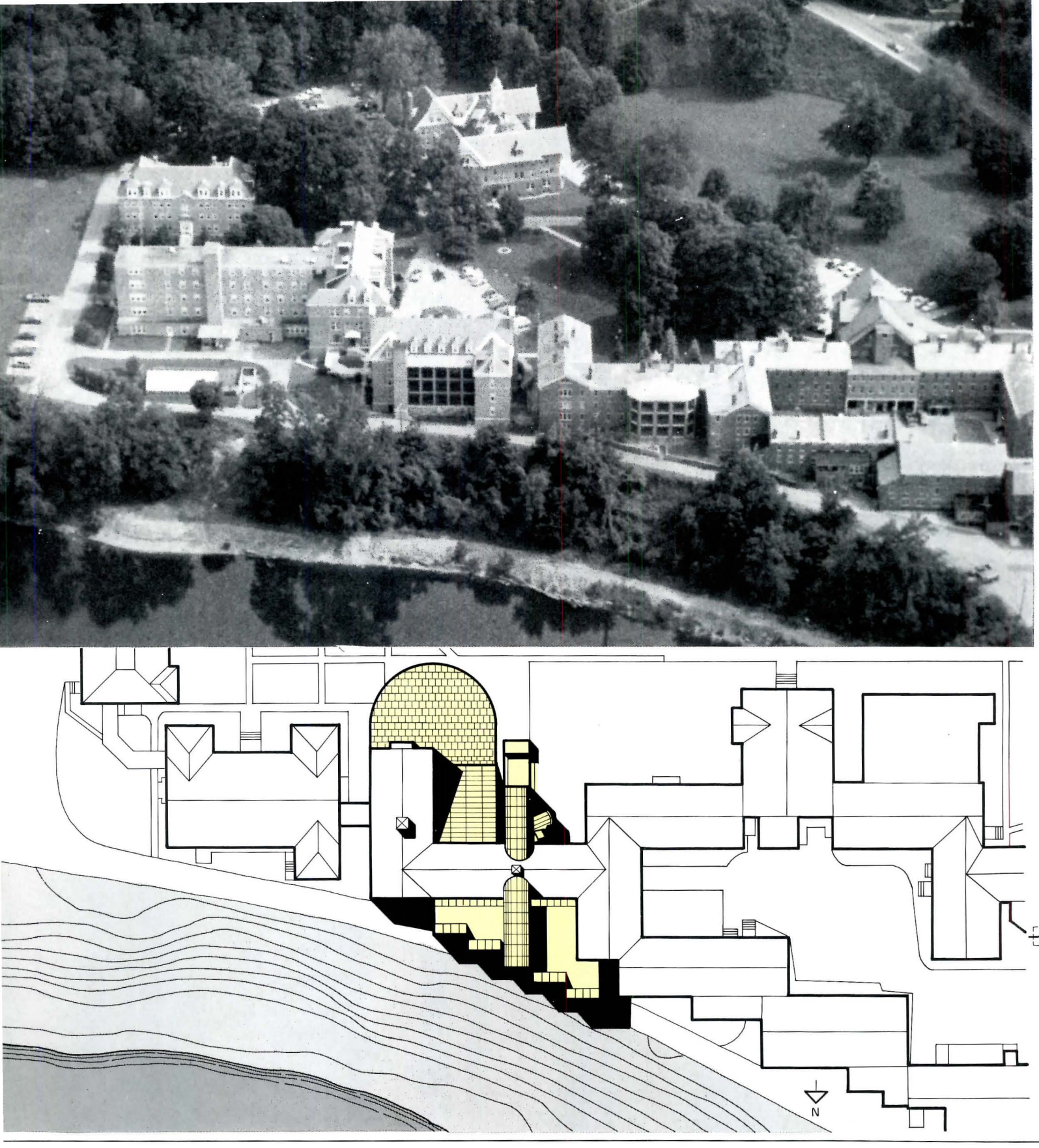
Of *course* we never do. Which was, and is, the point of this conference—the first of many to be co-sponsored annually by Columbia, UCLA, and RECORD. Sustained scrutiny of "critical issues" bearing upon the reuse of existing structures is going to show, as indeed it suggested cogently at Columbia, that it is not design quality that has sent the cost of health-care and construction skyrocketing.

Identifying these critical issues, Mr. Parker outlined and elaborated on the multiple dividends of this important option:

"Reusing what already exists, there are three-fold savings.

The direct construction cost can be reduced. Lowering that direct cost can lower the cost of financing. And third, there could be more potential for redistributing existing, diverse aspects of health care, particularly in urban areas, for more efficient service.

"Several circumstances further define the need for an in-depth investigation of reuse. One is the changing methods of delivering care—changing needs, increasing demand, demographic shifts, and of course epidemiological and technological advances. Another is rapidly increasing costs, in all sectors of society, but particularly in health care. These increases are limiting access which, in turn, is



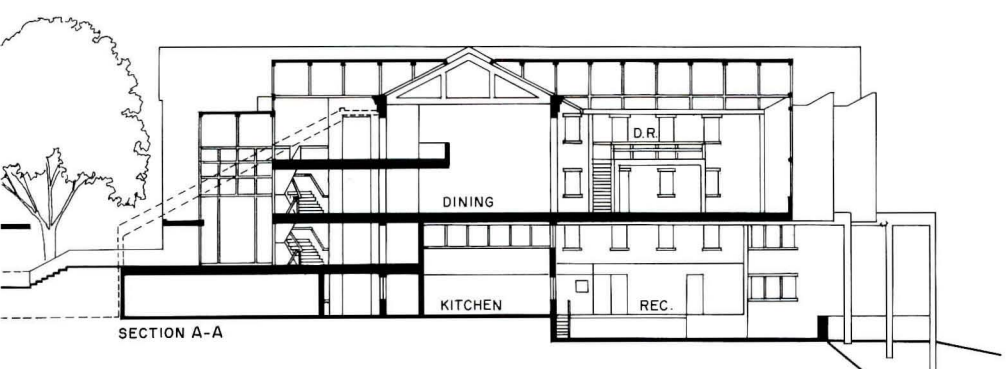
limiting ability to upgrade existing facilities to meet all these new demands. Still another circumstance is that a large portion of our existing facilities are facing obsolescence, with many vital services being delivered in inefficient, even unsafe, surroundings.

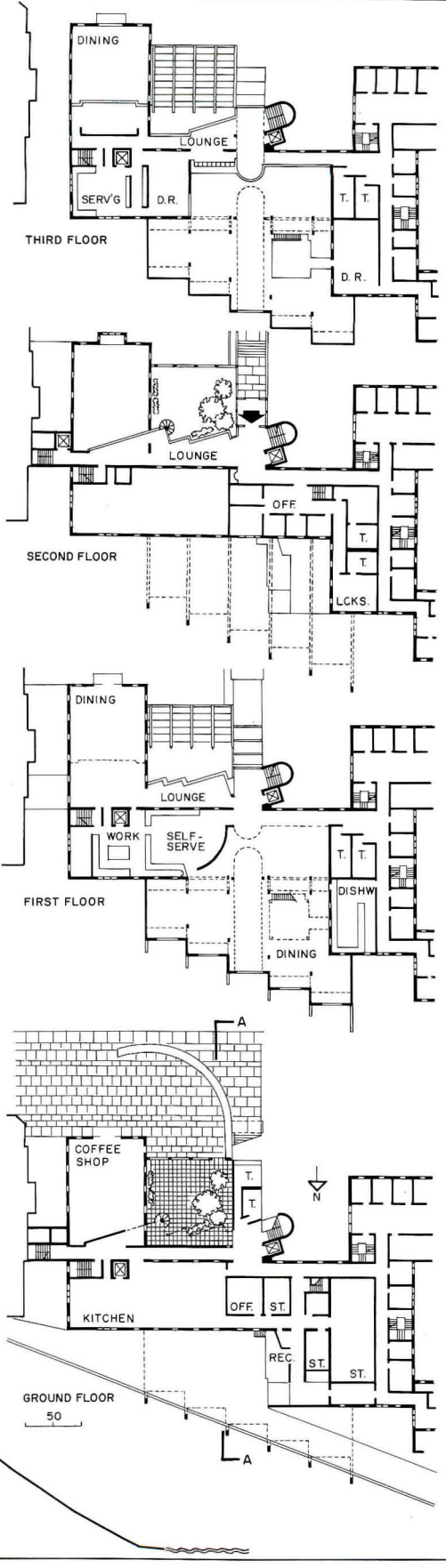
"All this is severely restricting, resulting in less flexibility as to how and where services are delivered. This, in turn, may actually be contributing to rising costs—many regions being locked into an inefficient configuration of resources. From the perspective of planning, then, the greatest potential of reuse is that it can increase our ability to solve such problems of maldistribution. From the perspective of capital cost, the need for new facilities may *have* to be accomplished, in the main, through the efficient reuse of what already is to hand. All-new buildings will continue to be constructed, of course, but the demand for recycling has already increased to the level that any architect active in this field rarely sees an all-new project. Furthermore, what with both increasing demand and pending legislation to contain health-care costs, the review of all capital expenditures is really tightening up.

"And yet, with all this going on, there is *very* little documentation about the actual cost of providing specific services in various types of facilities—be those costs long-term, short-term, direct, or indirect. Even less is known about the impact of additional capital expenditure for expanding or renovating existing facilities. Currently, projects that fall in the reuse-retrofit-reconfiguration arena are so *ad*

In process, this kitchen-dining facility for the Brattleboro Retreat, in Vermont, by architects Perry, Dean, Stahl & Rogers, has been skillfully fitted into a chain of older buildings, along an east-west axis, by a lake. The program called for fitting a function ideally suited to a one-level arrangement into a narrow four-story brick structure without destroying its character and fabric, preserving the chain-like sequence of the neighboring buildings, allowing a visual and physical connection between an intimate lawn and the larger vista of the lake area, and responding to the needs of psychiatric supportive setting. A vertical circulation system was inserted on the front facade, housed in a beautiful winter garden. Arriving at the main dining level, one is released into a horizontal, transparent enclosure, penetrating through the existing building and setting up a dynamic physical and sensory relationship between the indoors and outdoors.

INFILL, WITH FINESSE, FOR BRATTLEBORO





hoc that they threaten the very conditions which created the need. In some cases, reuse may be less cost-effective than higher forms of capital investment, and in other cases, sound structures, good for less intensive levels of health care, are demolished.

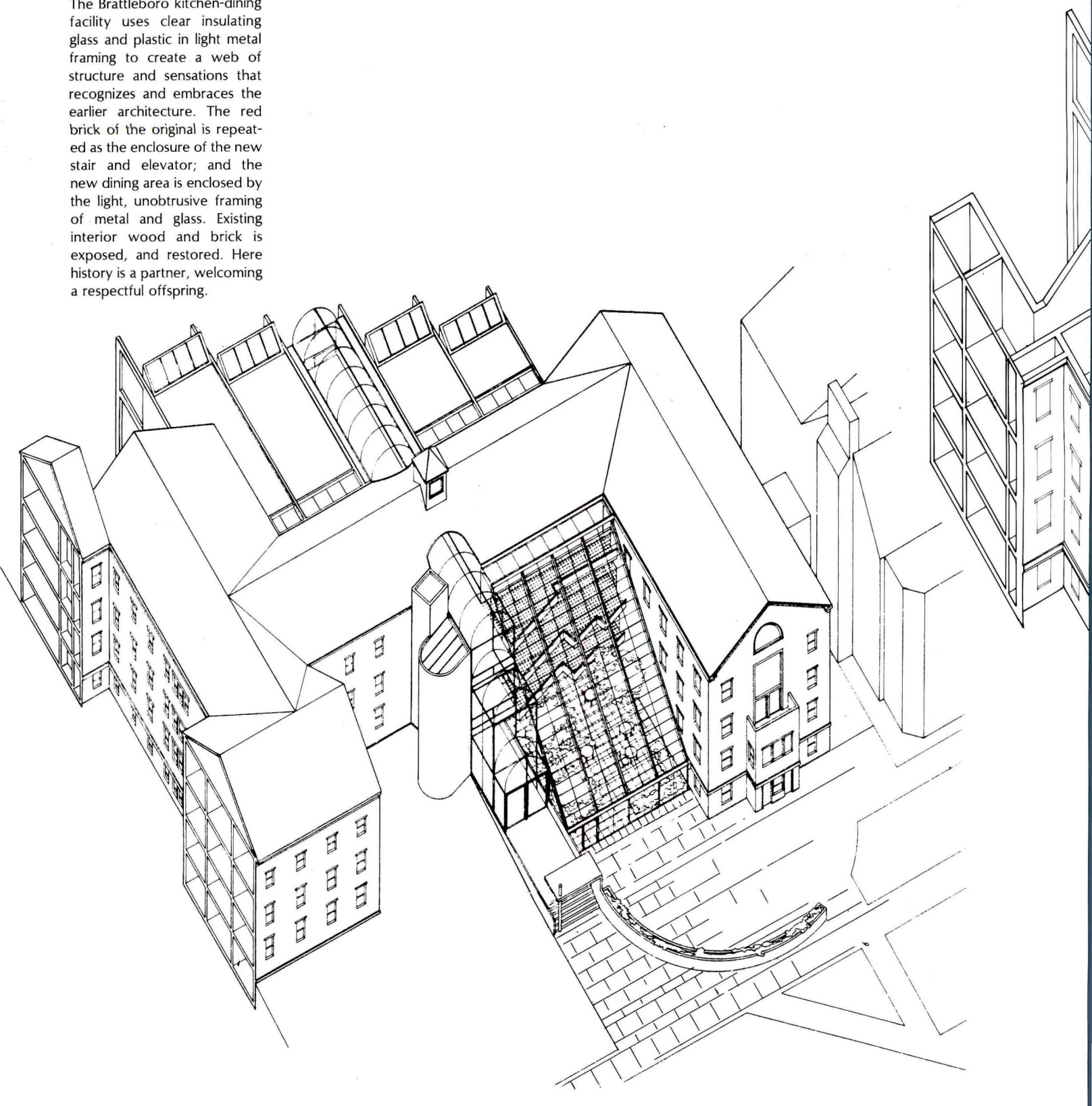
"Architectural and planning skill has to focus on the reuse task. With total project costs soaring over $100 per square foot, with the increasing rate of change in the means and methods of health-care delivery, new facilities can become obsolete before they are occupied. There is a clear need for efficient ways to deliver more appropriate types of facilities, for upgrading spaces of many different kinds—and with speed, with economy. This, is, by no means, a peripheral 'design' option anymore. This is a tactical concern."

There are a number of trends one should bear in mind trying to address the trend of reuse itself.

Mr. Parker elaborates: "The shift from inpatient care to outpatient, ambulatory care means that hospitals are having to provide new space for these services, either by adding new structures or reusing existing spaces within the structures they have.

"Along with this shift toward ambulatory care is the growing number of critical-care nursing services. We need, at the same time, fewer short-term acute-care beds—and this sets up a logical potential for reuse. Still, the conversion of existing acute-care nursing areas to critical-care spaces is a complex design problem, and optimum planning solutions are difficult if the methods and concepts asso-

The Brattleboro kitchen-dining facility uses clear insulating glass and plastic in light metal framing to create a web of structure and sensations that recognizes and embraces the earlier architecture. The red brick of the original is repeated as the enclosure of the new stair and elevator; and the new dining area is enclosed by the light, unobtrusive framing of metal and glass. Existing interior wood and brick is exposed, and restored. Here history is a partner, welcoming a respectful offspring.

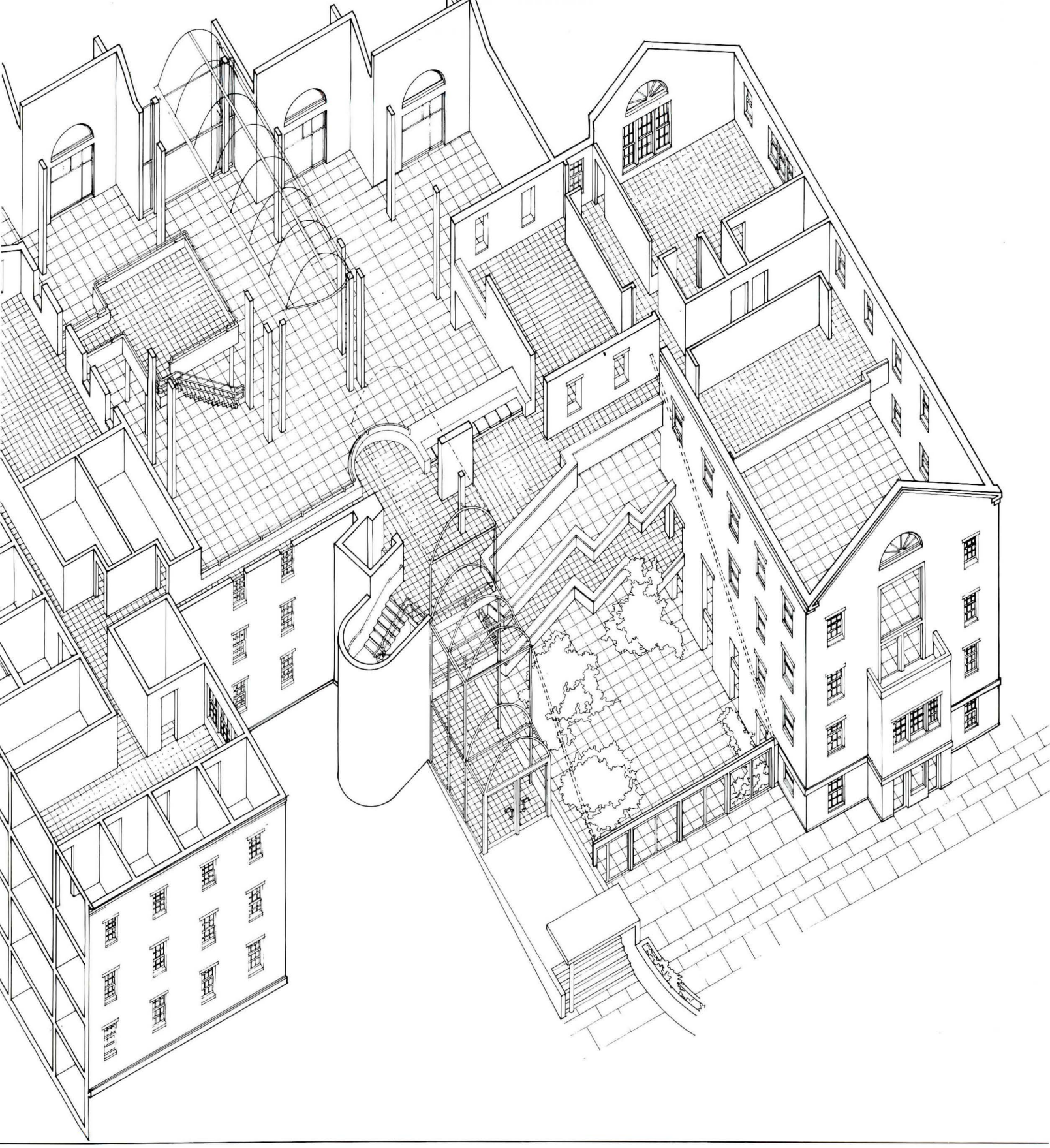


ciated with the design of new facilities are used. For example, placing a new intensive-care unit into an old acute-care nursing unit is *very* complex—one being faced with a space that is most usually long and narrow, while the new functions require a more squared-off configuration. Innovative design approaches are needed to deal with the structural and functional limitations of this type of project.

"Another trend has to do with all of the advances in technology. These advances, in diagnosis and treatment, mean continual change in all hospitals. For example, the estimated useful life of new radiology equipment can be as short as six to nine years—pressures to retrofit facilities increase accordingly.

"The aging stock of our existing facilities is also a factor. All those hospitals done during the early years of the Hill-Burton program are about 30 years old—or just ten years away from the age when they are expected to be obsolete. If 40 to 50 years is a reasonable expectation for the useful life of a building in this field, how are needs to be met in 10 to 15 years? And what is going to be done with all those Hill-Burton hospitals? A very critical period is approaching.

"And what about building codes as they pertain to reuse, since they pertain to virtually everything else? It is generally agreed that the United States has become oversupplied with short-term general hospital beds. It is also generally agreed that, whatever the access within the system, an equal number of beds may be considered



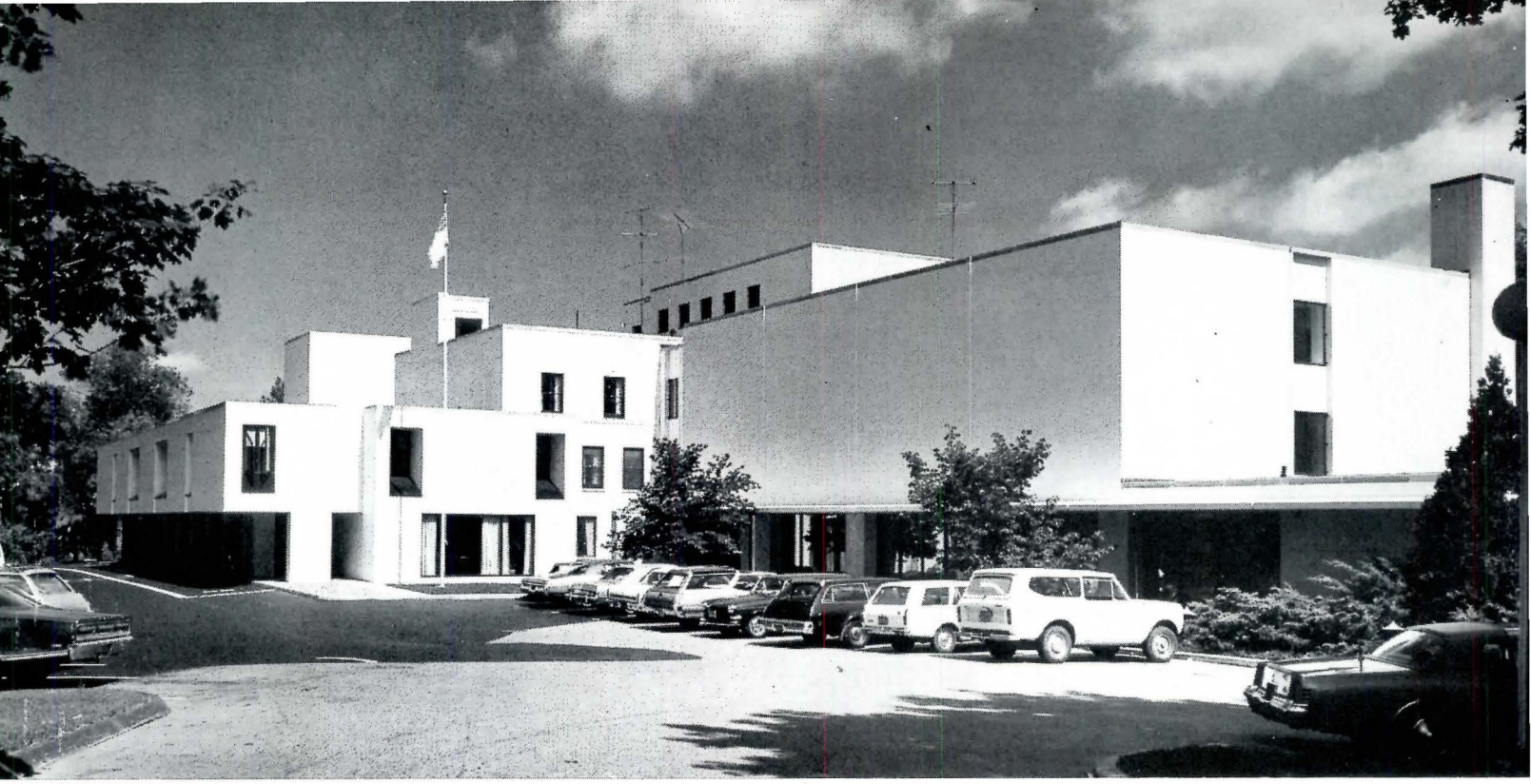
non-conforming as to current standards of safe occupancy. Rigorous codes were written to satisfy public needs in a time of lots of new construction, and these codes have improved the fire and safety conditions of new construction. However, many of these codes are retroactive. If an institution improves any portion of its building to meet increasing demand—let's say for ambulatory care—those codes may demand that the entire facility be upgraded. So the simplest, most seemingly logical reuse project can—given such a situation with the codes—turn into a costly, unanticipated, far more massive change. Not only are efficient methods of upgrading older buildings to levels of safe occupancy needed, but we also need to continually evaluate levels of safety in varied settings.

"Finally, of all the pressures for reuse today, the need for more efficient energy systems probably represents the greatest potential for reducing operating costs."

A key question raised by the Columbia conference, what with all these trends taken into account, was . . .

When does a facility really become obsolete—how can the tip-over point be measured?

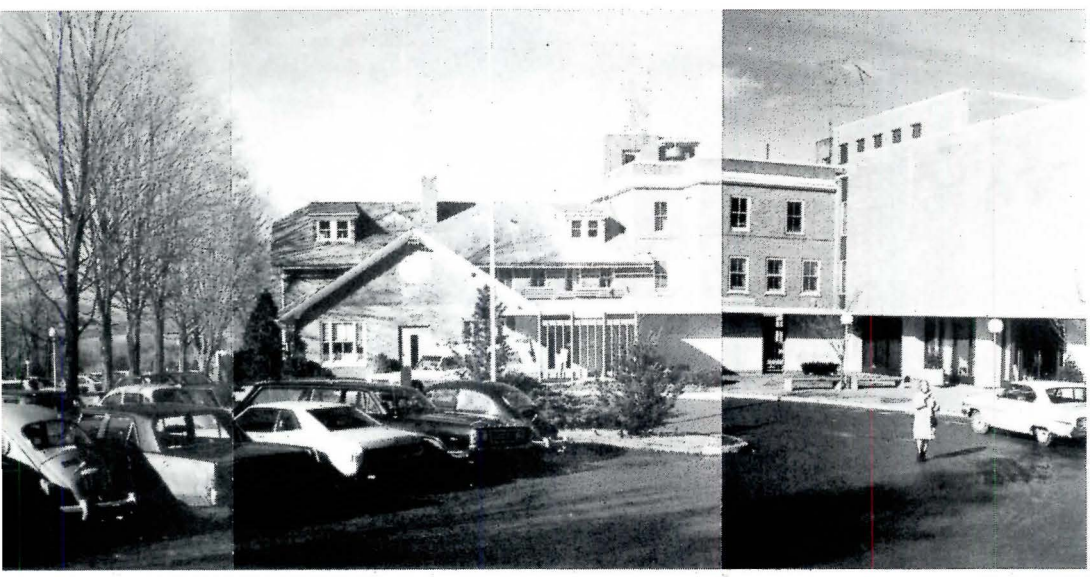
In many ways, as it happens. An institution with poor functional organization may not be able to meet the new demands of ambulatory care; it may be unable to meet evolving needs of a changing population. Both are forms of obsolescence in the making. From a

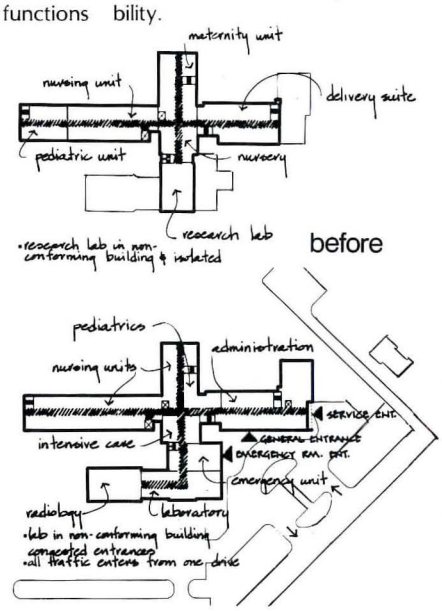


Bill Maris photos

A CAREFUL, CLASSY CONVERSION

At Sharon Hospital, in Sharon, Connecticut, architects Arneill-Kagen faced a typical problem of converting from an emphasis on in-patient care to a more balanced use of all functions. External and internal traffic patterns were confused. A master plan called for the sequential construction of two new wings. Once the east wing, a two-story element with ambulatory and ICU/CCU units, was operational, existing functions were removed from the non-conforming buildings, which were then demolished. The new three-story west wing replaces them, providing among other things new administrative areas and a swing unit for obstetric patients in conjunction with a surgical unit. The size of this unit can vary from three to sixteen beds, while maintaining complete separation and affording future flexibility.



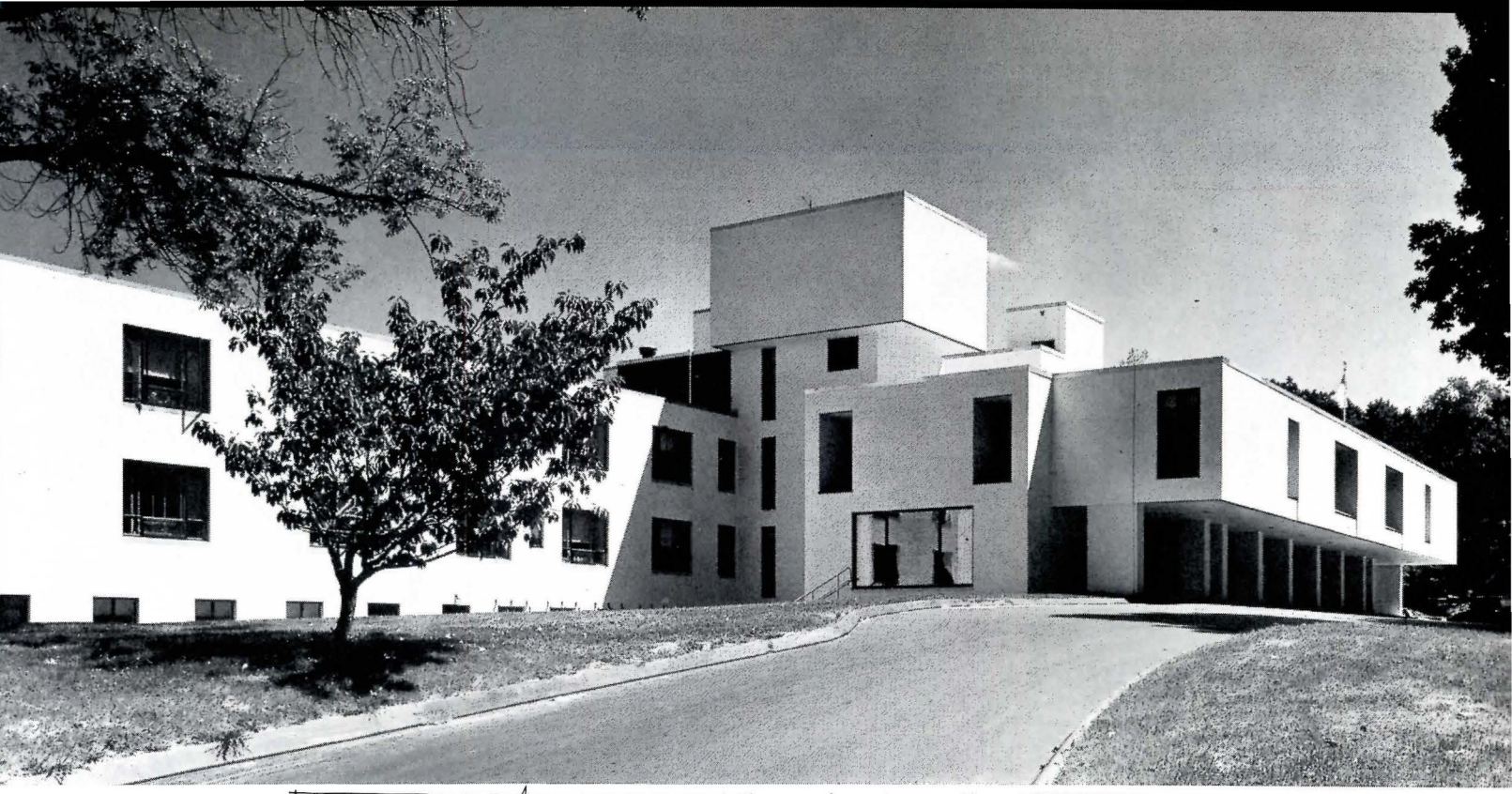


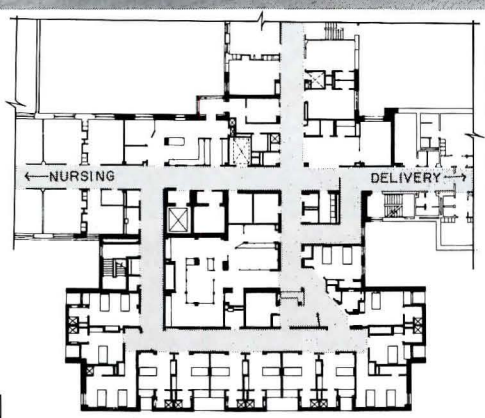
planning standpoint, it can be measured by an imbalance between the available supply of services and a community's need of those services. What's more, oversupply (one indicator) and undersupply (another indicator) can exist simultaneously in a community—it may have an oversupply of highly sophisticated diagnostic capabilities while having an undersupply of primary health-care services, or pediatric clinics, or family-care group practices. "Such imbalances are many and diverse," Mr. Parker maintained, "and I believe that the greatest impact of reuse will be where they help solve them."

With the pressures on the health-care-delivery system being so enormous, with the increasing rates of change rendering even well-conceived facilities unworkable, with the cost of inpatient care having zoomed passed $200 per day in many parts of the country, with the Administration and Congress debating about both cost containment *and* national health insurance, dramatic shifts in the system are certain, and, so the Columbia conference underscored, research must be undertaken if America's system of facilities is to respond smoothly, competently, and compassionately to these shifts—and to other pressures. Herewith, those "critical issues":

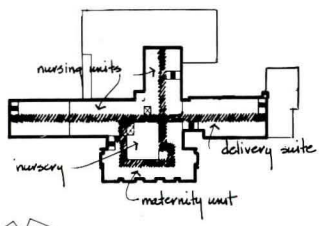
▪ Financial and economic feasibility

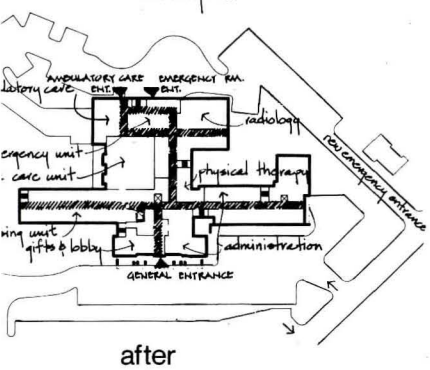
An institution's ability to service its debt is not an adequate measure for evaluating the impact of a proposed facility—or for determining whether or not that facility is "successful."





The newly-cast reception, business, and administration areas (right) leads on into, and sets the tone, for the clarity and cohesion that the architects have bestowed on what was once a rabbit warren of conflicting, disconnected functions. On the exterior, the new entrances have been separated, while a ring road provides continuous mode of access. A major goal was instilling visual continuity.





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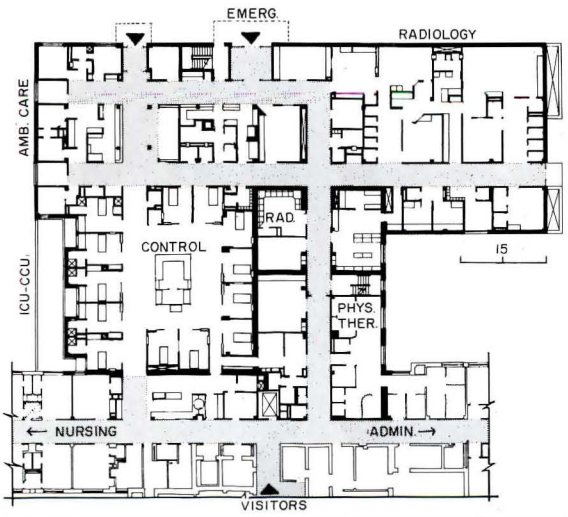


Beyond "financial" feasibility studies, "economic" feasibility studies are needed to relate the proposed project to the over-all economic structure of the surrounding community it is meant to serve. A hospital is not only a provider of essential services; it is also an important consumer of services—and an employer. Any health institution should be thought of as an infrastructural system *within* its community; therefore, health planning should be directly related to other social and economic planning for development.

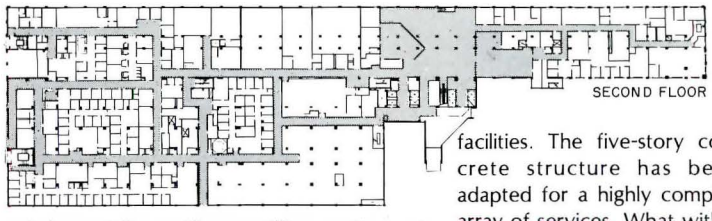
The increasing cost of *financing* health-care construction has clearly restricted reuse of existing facilities. With the increasing percentages of financing, the use of existing land or structures as equity for reuse costs could have a major impact on the total cost of building programs. Research on the potential financial impact of such reuse concepts should focus on techniques for managing existing facilities at the level of the region and the system serving it.

In this regard, a major question was posed by Mark S. Levitan, who is the executive director of the Hospital of the University of Pennsylvania in Philadelphia. *Is* new construction more expensive than reuse? This question can answered by way of a thorough investigation of all costs—short-term, long-term, direct, and indirect. This kind of investigation—called market analysis, most usually, in other industries—is not easy because so many factors are subject to so much change. Will today's health-care programs go on? Will the modes of delivering health care change? When, and in what way?

Bill Maris photos

A FOUNDRY GROWS IN BROOKLYN

The "new" Lutheran Medical Center—by architects Rogers, Butler, Burgun & Shahine—is the first major recycling of such a building for health-care facilities. The five-story concrete structure has been adapted for a highly complex array of services. What with a live-load capacity of 250 pounds per square foot on each floor, and a floor-to-floor height of almost 17 feet, the structure gave great leeway for complete spatial flexibility and the installation of interstitial elements. The old shell was maintained almost intact, windows being reglazed with reflective glass. The new front entrance is above.



Are there alternative institutional arrangements which may reshape the market? Within these contexts, salvaging existing facilities can be evaluated as an infrastructural challenge—determining how such structural strands may reinforce the larger fabric of the neighborhood and community.

Financial feasibility is a numbers game. On the revenue side is this critical fact—the market out there, the source of reimbursement, is very sensitive to change. With, say, a 40-year investment, and a 40-year bond issue, institutions have to be careful about the revenue assumptions that are made, and about the risks associated with the particular department of health care being beefed up.

In several states, there is a large amount of outstanding debt for facilities that are now defined as unnecessary because of an oversupply of beds. Restrictive clauses in the financing can prevent the reuse of those institutions as nursing homes, doctors' offices, or whatever range of new uses that might be needed now.

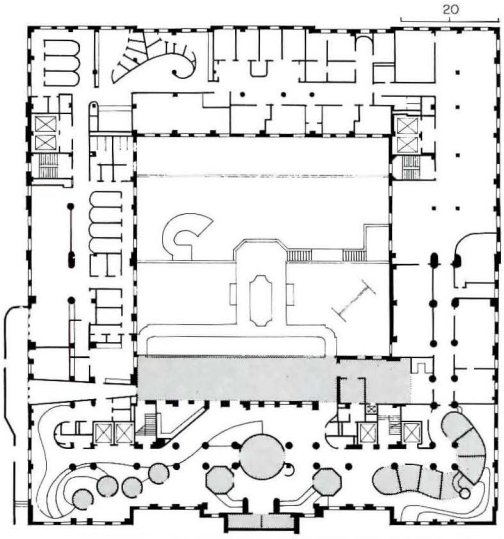
There are several specific areas for future research in financial feasibility.

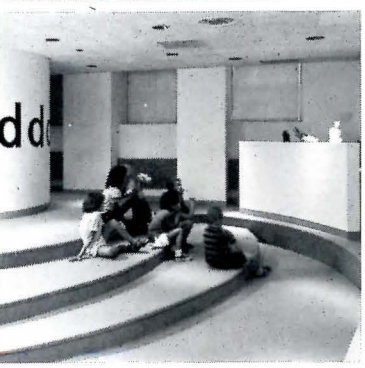
With respect to establishing evaluation criteria for the economic and financial feasibility of capital projects, analytical techniques are needed to evaluate many, if not very dramatic, types of construction in reuse or renovation. How can the financial feasibility of a required addition of fire sprinklers be considered, for example? Are there different criteria for looking at the financial feasibility of reused as

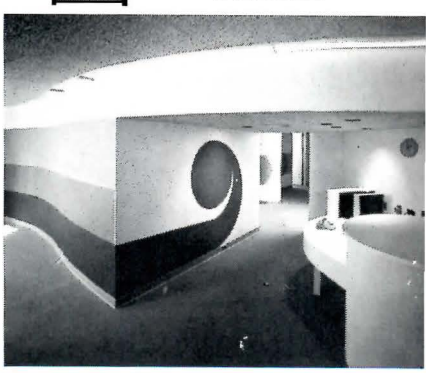
John Brefach photos

DIAGNOSIS IN JERSEY CITY

The Jersey City Health Center, by the Hillier Group, is a delightful diagnosis center for school-age children that has been fitted into the outmoded, abandoned floor of a hospital. The kids in effect take "school trips" here for the purpose of staying well, learning something, and having fun in the process of consultation. The architects enclosed a portion of the existing courtyard as a playroom and reception area (above and left). From this point, elementary groups fan out for a full day's program of educational and recreational activities that are correlated with the health tests being administered from point to point. The flow is perfect.







opposed to new construction? Case-method-style research should be done, the conference concluded, to break down the layers of cost on completed projects. This would help to develop more fully a feeling for construction costs, but, more, it would deal with total project costs, full operations cost, and life-cycle costs.

With respect to financial constraints on the reuse of health-care facilities, the question has to be asked, and answered, about what limitations do various financing and approval methods place on more efficient utilization of existing facilities. The existing financial feasibility and certificate-of-need process serves a gatekeeping function. This is based on the assumption that there is a need to control access to the marketplace by individual institutions, and that society wants to ration resources to the health-care system. The question is, are resources really scarce, and do the financial markets want to see them rationed?

About cost containment. A lot more has to be done to establish the relationship between financial, or economic, *feasibility*, and cost containment. The impact of reusing or reconfiguring existing resources could have a significant impact of reducing health-care costs, but the economic impact on the neighborhood or community may be greater with higher levels of capital investment. How can the process of decision, at the micro level, achieve a balance between economic development and health-care cost containment?

Research into the relationship between construction costs and

NEONATAL AT ITS NEATEST

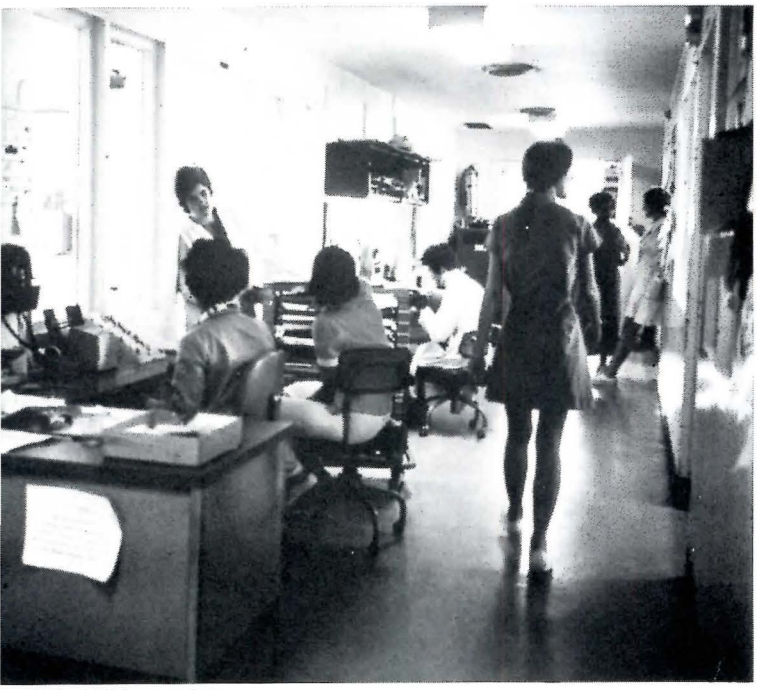
This unit at Cornell Medical Center in New York, by Skidmore, Owings & Merrill, is a spiffy reconfiguration, almost 11,000 square feet in area, of an existing facility. The design, incorporating the most advanced technology and advances in this critical area of care, is a mercifully graceful, direct, and comforting accommodation, while ensuring maximum efficiency and, importantly, easing the psychological and emotional strains that are inevitable, for both family and staff, in such an intense setting. The infants are usually brought into one of the three intensive-care nurseries, each holding five; and are sent along, as their conditions improve, to one of the three intermediate-care nurseries, each holding eight. Before going home, they are housed in the convalescent-care nursery. Special hexagonal units were designed in both the intensive- and intermediate-care area to see to the needs of critically ill infants, who demand constant attention. Each of the three units in intensive care has five "isolets" that are radially arranged, and a "carousel" rotates readily to bring materials and instrumentation with easy reach. This is exemplary of the potential of reuse.

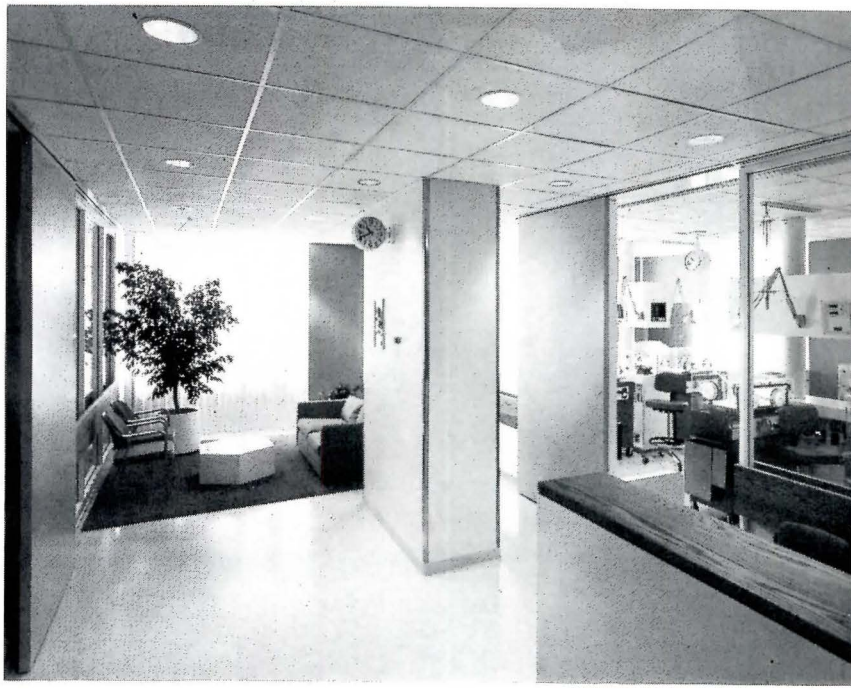
operating costs is vital. Is there a marginal benefit for new construction because you can use more advanced technology in building design and construction? Methods of documenting the impact on the operating cost of capital construction projects needs to be developed, taking into account the product or result of the system; for example, projecting the number of patient visits. Measurements of operating efficiency must quantify those products with their *spatial needs*—*also* with the value of construction. In this manner, the marginal benefit of reuse, as opposed to new construction, can be related to operating costs and become, in turn, a more effective decision-making tool.

One other question, in the context of financial feasibility, is to determine whether or not there may be a market for unnecessary or excess hospital buildings. Could they be reused, working in the opposite direction, as office buildings, stores, apartment houses, schools? What is their relative market value? Can the value of that existing property be leveraged into financing for such reuse projects, which, in turn, could mean revenue for the institution in meeting new needs?

▪ Codes and standards

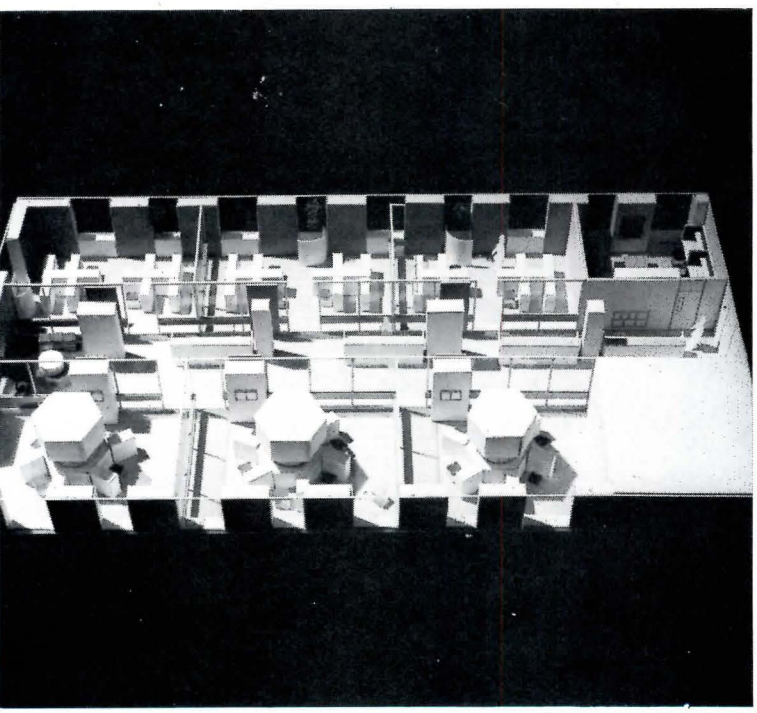
Too many different codes exist—and additional confusion is caused by authorities using different issuances of the same code, the conference agreed.

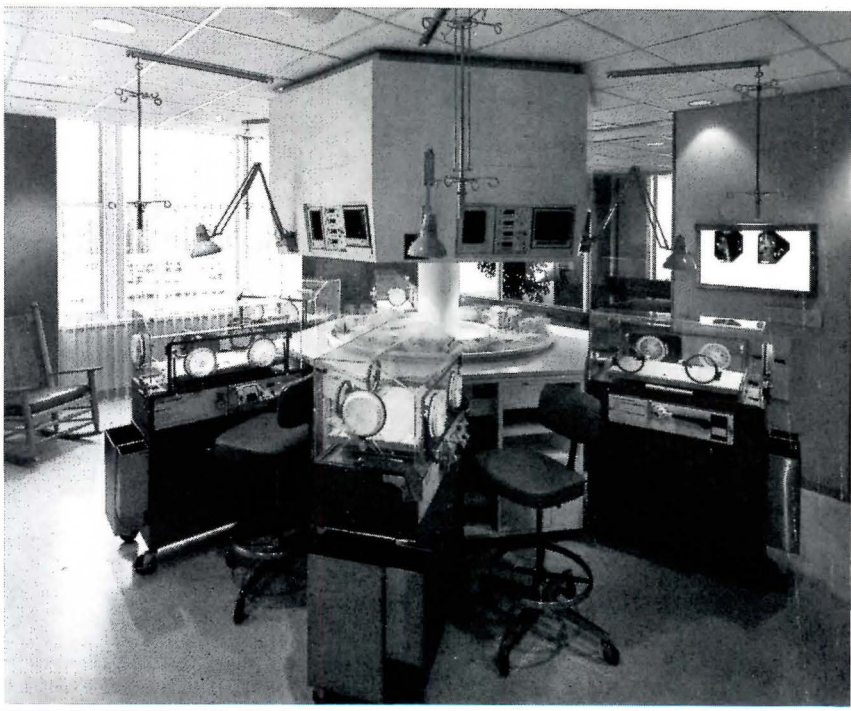




Nathaniel Lieberman photos

Updating and modifying an existing facility can be an occasion for either intensifying or easing the familiar frenzy and desperation of the complex intensive- or intermediate-care environment. The Cornell neonatal unit as designed by SOM is a remarkable achievement in that, despite the ubiquity of the equipment and intensity of staff responsibilities, it comes off as a tranquil, encouraging setting in which the machines of life do not overbearingly shove aside the feelings of security and hope.





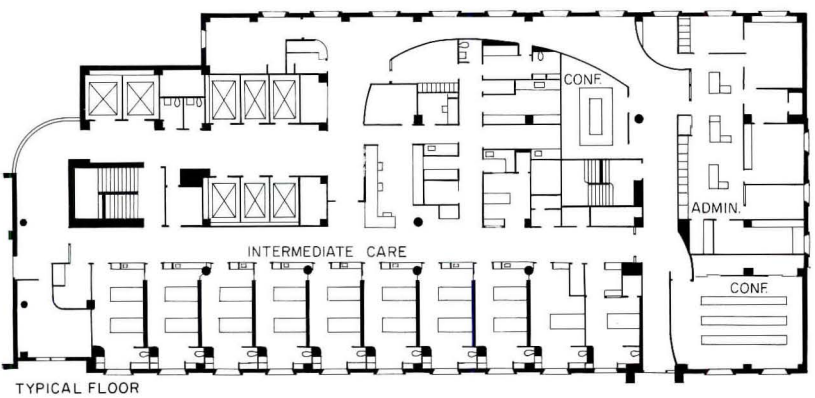
However, the codes-and-standards component of the Columbia conference—moderated by Grady Smith, (who is the chief of the Architectural, Engineering Design, and Equipment Branch of the Division of Facilities Development at the Bureau of Health Planning and Resources Development at HEW)—emphasized the need for the Federal government to "get its act together" by determining which issue, of which code, should be referred to by *all* departments and agencies. Specific note was made of Medicaid and Medicare referring to different issues of the same code. It was also emphasized that a centralized group in the government could, and should, develop uniform references in the utilization of codes as a service—indeed, as assistance—to the states. This might well be disregarded by those states with more sophisticated, cohesive codes, and code referencing of their own, but many states would welcome the incorporation of a cohesive national standard, by way of referencing, in their own respective standards.

Another major point was about arbitrary enforcement—the lack of uniformity in the interpretation of codes by officials. The intent of codes is one thing, and it is agreed that the intent is generally reasonable. But enforcement is subject to wide variations of legal and professional judgment; also, there are too many enforcement authorities. That a project must be reviewed by two to three dozen different authorities on the way to "approval" is a disgraceful and demented spectacle.

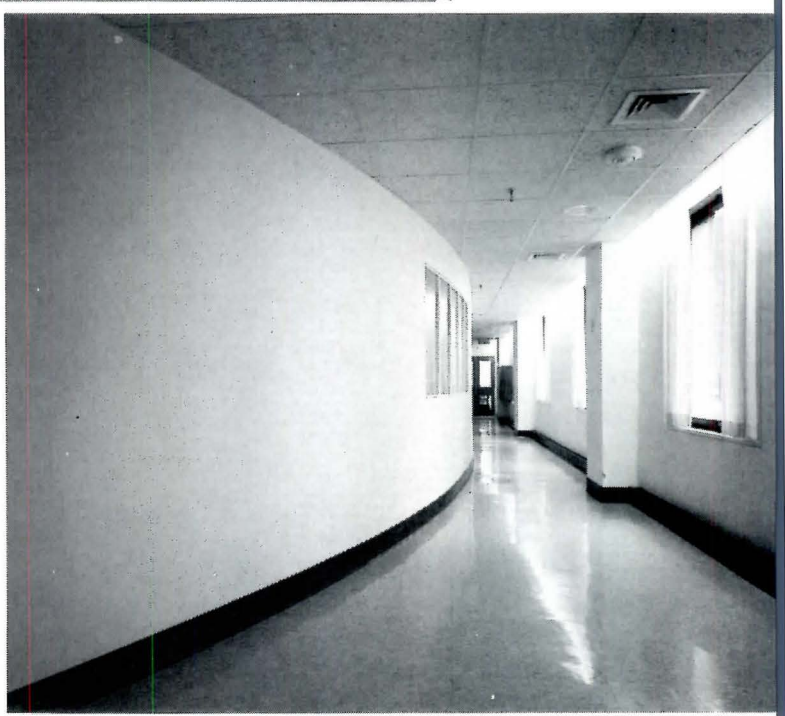
In the Surgical and Special Services Building for Massachusetts General Hospital, Perry, Dean, Stahl & Rogers brought off several retrofit solutions. The existing roof, raised eight feet, now houses a pioneering energy-conserving heat-recovery wheel. Circulation has been placed along the exterior of the old building for natural light and views. Spatial innovation for the patient bedrooms includes a patient-service module that has the appearance of household furniture (left) while, at the same time, providing integration of all technical, lighting, and storage needs. This headboard job is competitive with comparable commercial products. The project includes 24 intensive-care bed, 137 intermediate-care beds, and a range of support services. All this is calmly coordinate, and looks it.

Edward Jacoby photos

SURGERY ON MASS GENERAL



TYPICAL FLOOR



The "Decision Tree" approach of architect J. Armand Burgun, a participant in this component of the conference, was discussed as a positive direction for research into alternative code arrangements. This would establish basic levels of protection for life safety, without regard to building type.

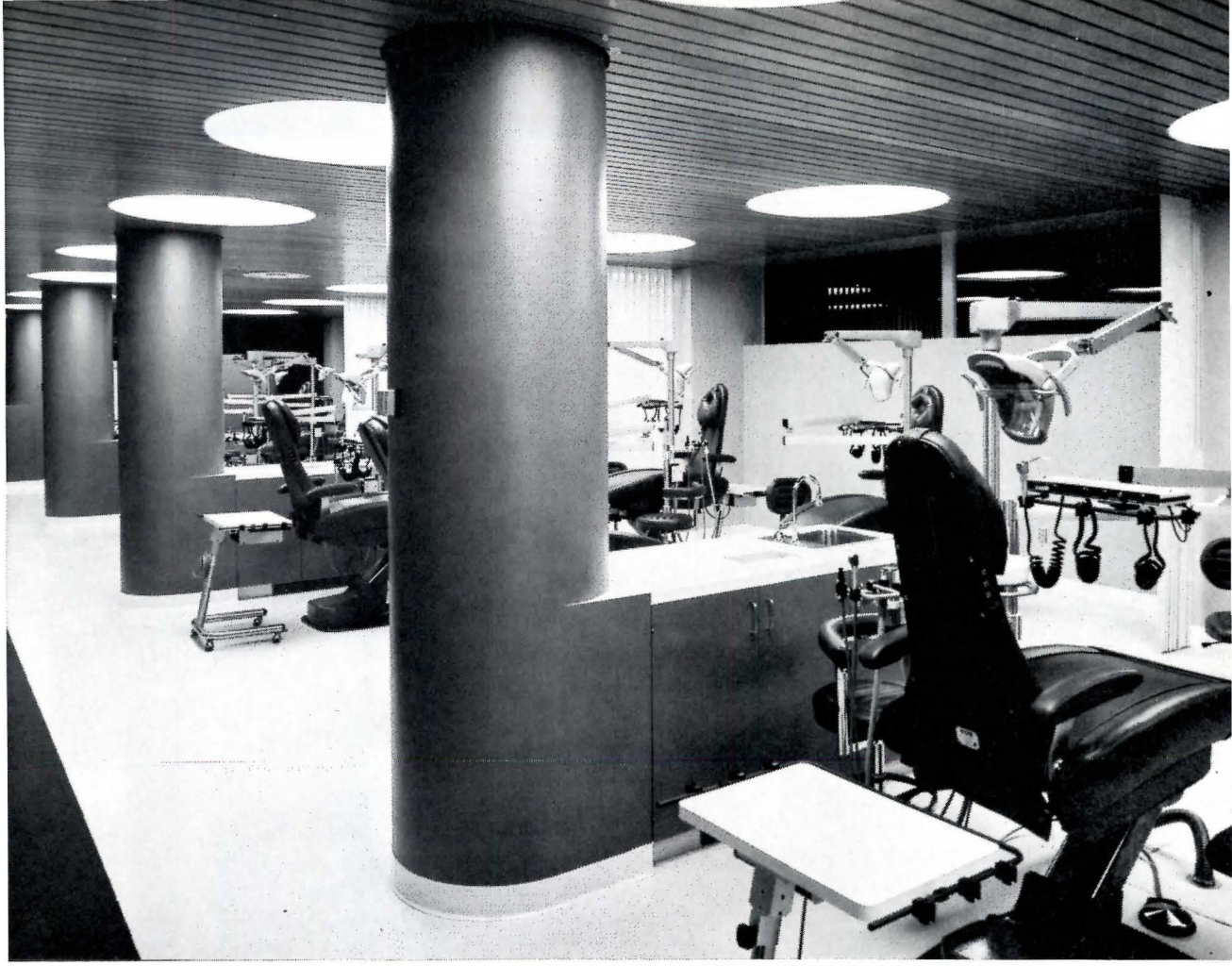
The authority responsible would choose that level most desirable for a particular region of a building—one level, say, dealing with hospital occupancy; another level, with such public-use areas as cafeterias and lounges.

With respect to future research, the interpretation of the intent of codes remains a major problem. Medicare and Medicaid conducted a series of national training sessions, using a common panel of instructors, who had as many problems as everyone else. There should be research on training procedures that would ensure a more uniform interpretation of life-safety intent.

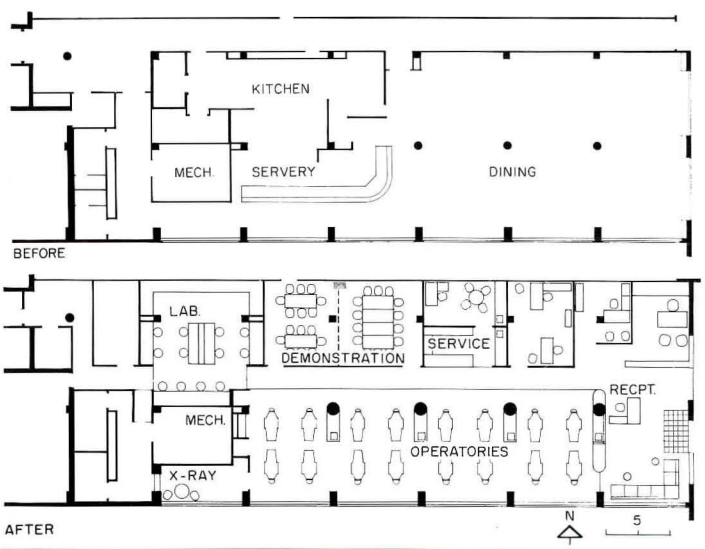
Since codes can be the principal measure for finding a facility obsolete, they can also be a major determinant of the viability of a proposed reuse project. By identifying the major code determinants of successful reuse projects to date, a scoring system could be developed which could give a go/no-go signal for potential reuse projects. Further definition might allow the identification of reuse limits—such as a "go" for ambulatory, a "no-go" for a nursing home.

Broad research must also be done to determine the effect of

At the Dental School Continuing Education Facility at the University of Oregon, Portland, architects Zimmer Gunsul Frasca have taken the basement/first level of a three-story addition to an eight-story tower and recast it as a place to provide refresher courses. Originally used as a cafeteria, storage, and mechanical area, it now houses a separate entrance and reception area, administrative offices, labs, demonstration and conference areas, x-ray facilities, and four operatories served by one service-and-setup area. Retractable screens can be closed to separate the operatories into four-chair pods for isolated demonstrations, each pod being served by a work station. The play of warm colors, and of skillfully handled lighting, gives the place a unified but endlessly interesting character. The dentistry equipment becomes, here, as basic to the esthetic nature of the spaces as the array of colors, textures, or the flow of space, which is very efficient. This facility is in itself a refresher course on handling spatial left-overs.



A SPACE FOR DENTAL CARE



Ed Hershberger photos

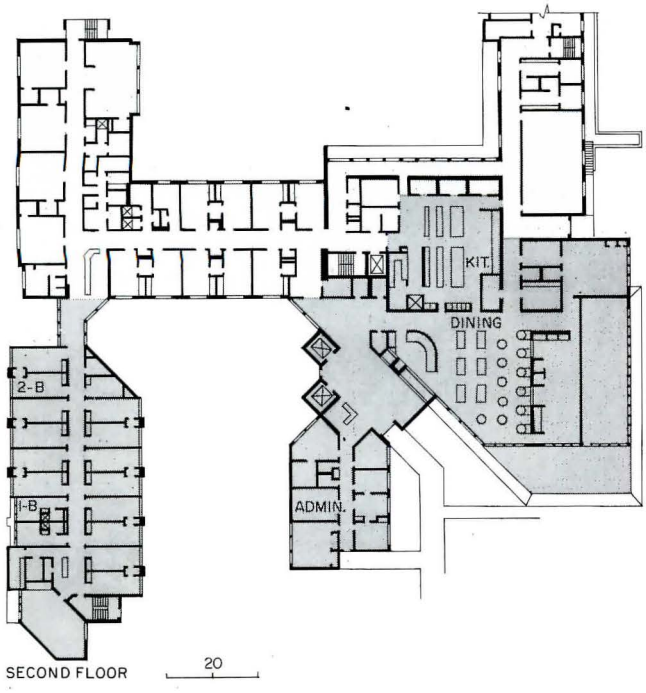
codes on the quality of care and the cost of care. How do life-safety codes relate to the cost-containment issue? What has been the long-term effect, both direct and indirect, of more extensive life-safety codes? The building codes of other countries should also be analyzed, and their effect compared the experience here.

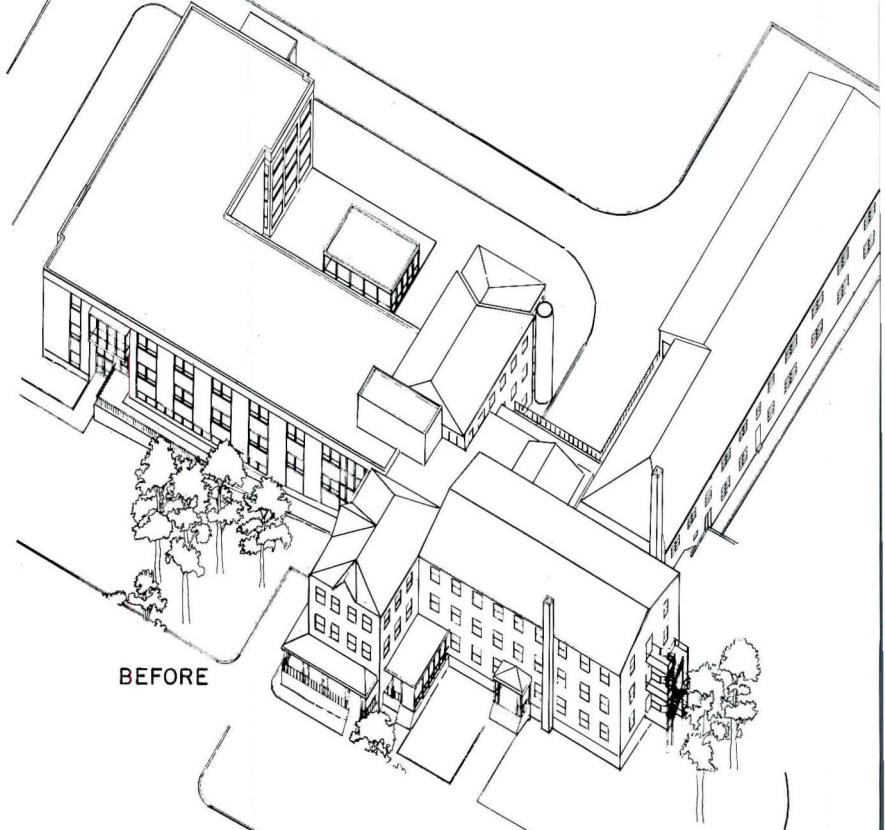
Finally, case-method research should be done on the relationship between codes and the efficiency of operating facilities. Is there a defineable relationship between specific code provisions and the methods of delivering health care, and to what extend do codes limit innovation in design? Is there a cost for improved life-safety provisions which can clearly be related to the increases in health-care costs?

▪ Systems approaches

The solution to many of the code compliance problems, just mentioned, are in the domain of systems. An efficient construction method for installing fire-sprinkler systems into existing health-care facilities would solve one of the most pervasive problems forcing new construction, since the lack of adequate fire-safety systems is the leading cause of obsolescence. In a similar sense, creative solutions are needed which will allow the efficient retrofitting of mechanical and electrical safety systems, ventilation, and air-conditioning systems; the addition or upgrading of elevators; and other communication, distribution, and movement systems.

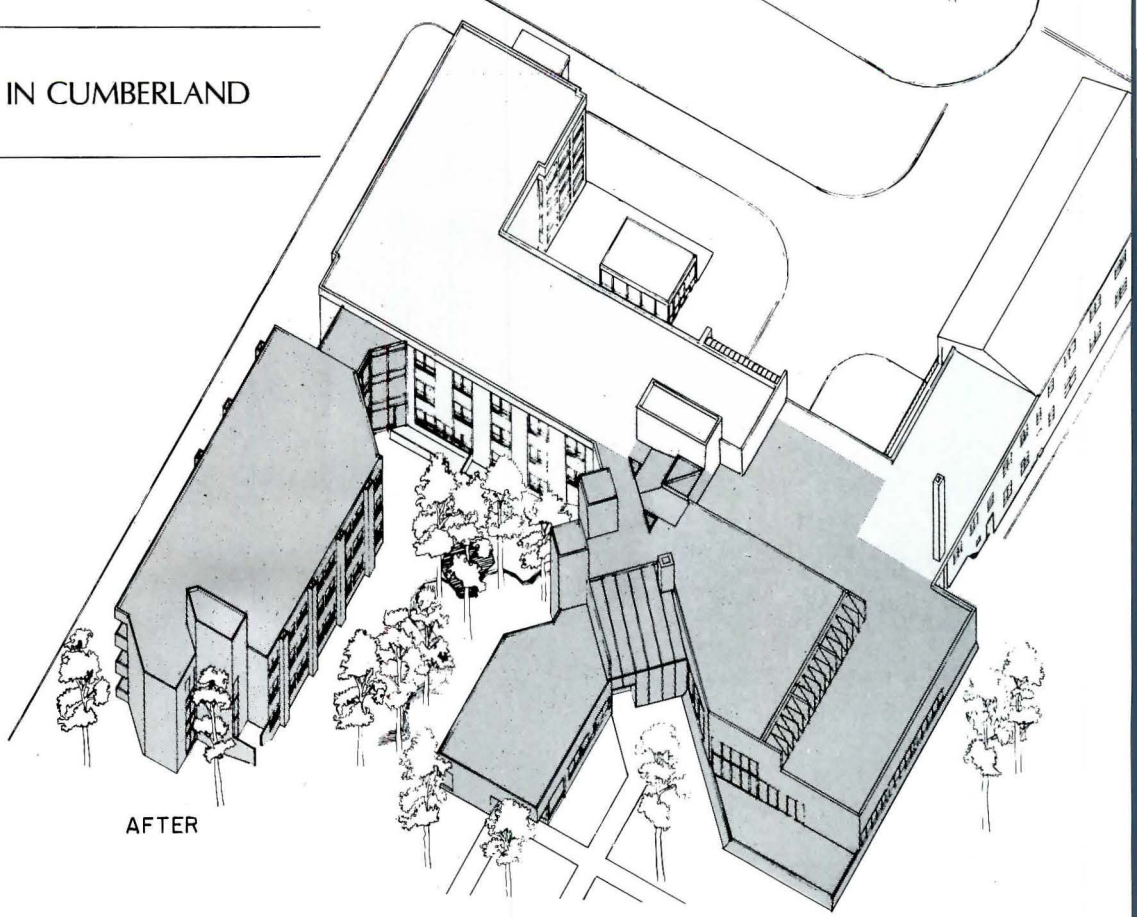
Most of the recent systems studies developed in this country





ENCOURAGEMENT IN CUMBERLAND

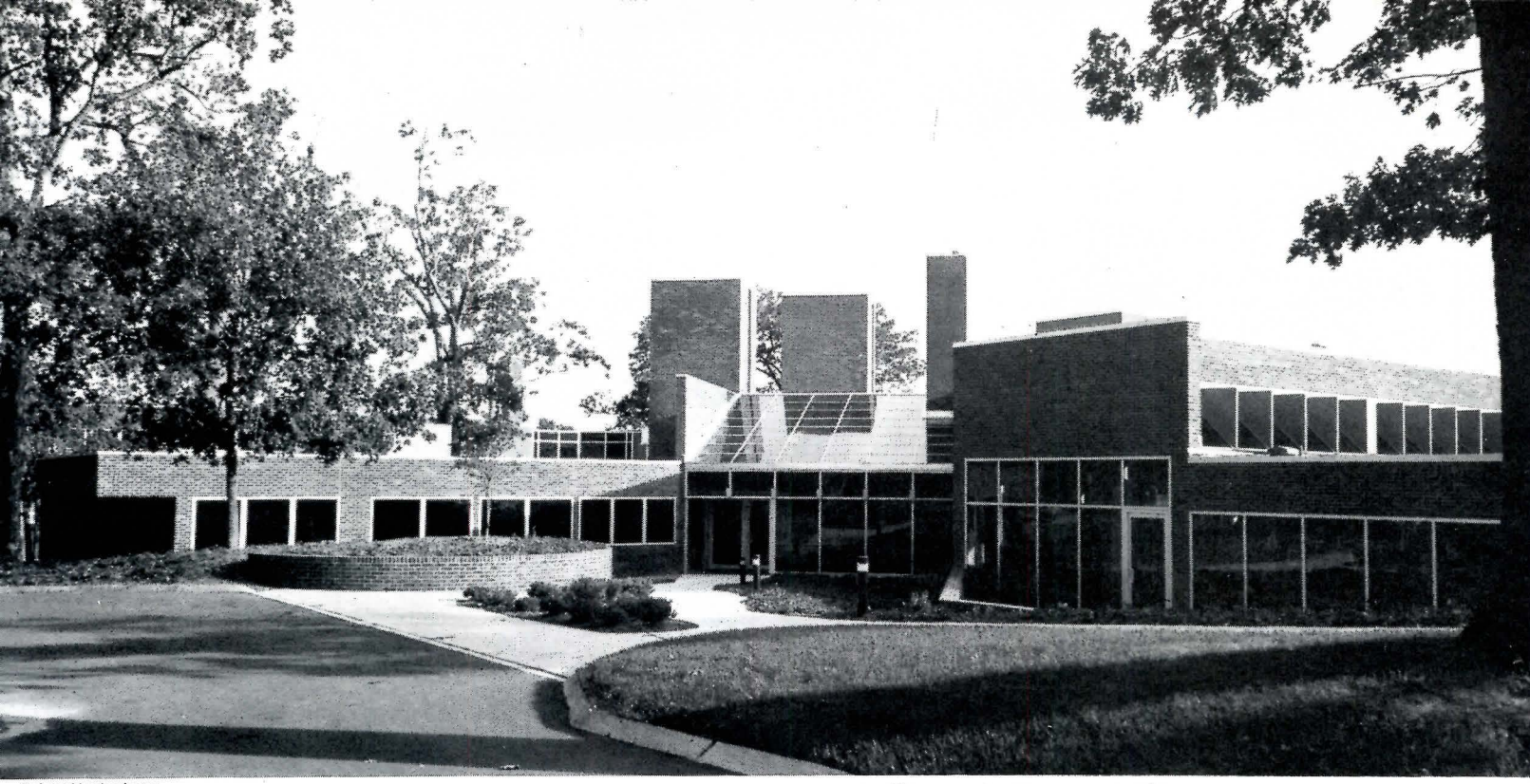
At the Manor Nursing Home of the Cumberland County Medical Center, the firm of Architects II removed those areas of buildings which could not conform, renovating buildings, engaging in new construction for bed replacement and needed support services. Because of the complicated nature of the work, and considering that the facility had to remain open during construction, very careful phasing was of the essence. The design includes a 92-bed patient wing on three floors, forming a "T" arrangement with the existing patient wing, and with new support consisting of a lobby, recreation-dining room, therapy areas, and outdoor courtyards of considerable charm. Renovation includes reconstructing the kitchen, receiving and storage areas, employees' facilities, linen areas, and pharmacy. This design, so sympathetic to people as to function, is an example of how reuse of existing facilities is as much a challenge in deletion as in creation.



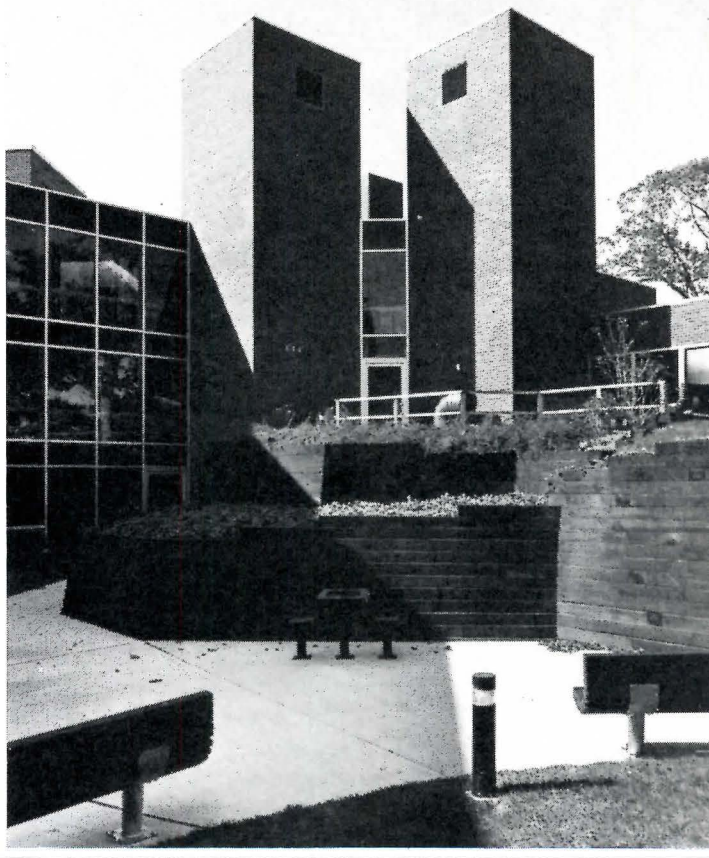
have been influenced by an over-riding concern to reduce the costs of new construction, either directly, or by reducing the amount of time required for construction. As a result of this, most of the available techniques and systems will not accommodate the "limitations" of older, lower-technology structures with comparatively low floor-to-floor heights.

The Veterans Administration was a leader in the field, but tended to focus on new construction The profession as a whole seems to be stuck almost solely on late-generation systems and their conceptual corollary, interstitial space. We need an option, turning our professional attention to the reuse of existing structures, developing systems which *will* accommodate the everyday needs of small, incremental, segmented changes—doing so efficiently.

Key questions with respect to systems approaches are about the relative pertinence of performance criteria. Should they be the same, applied to a reconfiguration project, as they are for new construction? Are existing institutions, engaged in long-range planning for facilities, making sure that there are clear strategies for the future maintenance and adaptation of mechanical and electrical systems—in addition to defining their long-range spatial needs, similarly mindful of inevitable change? Finally, the major research recommendation to emerge from this component of the conference is that a baseline of information, and methodologies, be developed



Robert Harris photos



so that institutions and planning agencies can make more expeditious, and accurate, go/no-go decisions about what to retrofit and what not to retrofit.

Case studies of completed projects are needed, and badly, to document the critical points in the process and the generic solutions to various problems. Once a base of information is collected and analyzed, most parties will be in a stronger position to make informed decisions about the options facing them. This kind of research should be dove-tailed with both evaluations of the success of early experiences with systems design, and demonstration projects dealing with the reconciliation between systems and the trend toward reuse of facilities.

▪ Project implementation

A major concern for any hospital administrator faced with renovating his facility is the potential loss of revenue during construction. This loss, from closing a portion of the facility, represents an important indirect cost, and one seldom considered until the architect starts working out a phasing plan for construction.

Such phasing, the scheduling of field work, and the mechanics of project management—all must meet the particular demands of reuse construction. The uncertainties of "as-is" conditions usually result in conservative budgeting and estimating, discouraging innovative design solutions. Managing the design-and-construction process in the reuse area may be best accomplished with a mutation

of the construction-management approach and the fast-track or design-build strategies. And to minimize the interruption of service, it has been shown advisable to involve the contractor as soon as possible, encouraging the architect to watch out for design approaches that might maximize the interruption.

Most reuse is done on an *ad hoc* basis, with very little background information, and large contingencies. Few institutions, remarkably enough, have accurate, up-to-date plans of their buildings, or complete information on the utilization of their space.

This component of the conference came down hard on the fact that we are nowhere near as good as we should be in managing our health-care facilities *as resources,* and research was called for in the area of facility management generally, and its application to the health-care sector. Further, case-study research should be done on a sample of facilities across the country to examine the needs and demands for change in today's health-care environment. What has been the rate of growth and change in these institutions? What has been the extent of reuse or renovation to satisfy these needs? And what have been the barriers to needed reconfiguration projects?

As architect Lawrence H. Mason, of Mason, Da Silva Associates, pointed out with respect to implementation, "In an age when virtually all health-facility construction must obtain public approval, one can say that the first step in implementation is the institutional planning and documentation necessary for achieving that approval." If, however, planning is more than collecting data, more than investigating problems and writing reports—if, in fact, planning includes administration of "the plans,"—then implementation must be viewed as an ultimate objective, a critical step, in an *on-going* process. Whichever emphasis is given, the architect is a key member of the team, to be brought on early, not only as a "designer" in the traditional sense, but also as one who can lend dimension to the conceptual nature of the changes being considered, and which will in turn form a primary basis for the preliminary review of the appropriate agency. In fact, this component of the conference urged, with respect to certificate-of-need reviews, that policy be established that would make such first reviews conceptual only. With reuse, retrofit, or reconfiguration, it is not often possible to fix upon a cost estimate before planning studies.

▪ Planning strategies

Architect Richard Miller, an adjunct professor at Columbia who moderated this component, gave a vivid account of what "planning" and "strategies" consist of: "The current structure of health planning, under P. L. 93-641, passed in 1973, starts at the local Health Systems Agency (pronounced Ha-*SAH,* as if one had delivered a lethal karate stroke). This local HSA passes recommendations along to the State Health Planning Development Agency (pronounced 'shipda'), which reviews recommendations to be passed along to SHCC, or the State Health Coordinating Council ('shic')."

What with this crazy-quilt of review, approval, and accountability, the application of reuse strategies must be coordinated by the HSAs. Logical methods of integrating this potential option into health-systems planning, and annual implementation planning, must be developed. As indicated earlier, the greatest impact of reuse may be in helping solve problems of maldistribution of health-care resources and services—optimizing the utilization of existing facilities and programs. For the HSAs to make more accurate and balanced judgment, regional inventories of "what we've got" and "how it's being used" must be carried out—not for the sake of more data, which this field is drowning in already, but to analyze and manage that data so that regional resources are made the most of.

Policy recommendations in this area included making analysis of reuse, retrofit, reconfiguration, or outright removal of facilities a required part of comprehensive planning; developing such plans only within an environment of appraising existing facilities—recording and continually updating the data about condition, utilization, and efficiency; having the HSAs explore reuse alternatives before underutilization actually occurs; mandating the integration of health-facility planning and physical-community planning; removing legal obstacles to an institution's returning buildings or land to the marketplace for other uses—returning them to the tax base, in more pragmatic terms; and creating a financial incentive system, as pending in Senate Bill 2410.

Dr. James R. Kimmey, who is the director of the Midwest Center for Health Planning in Madison, Wisconsin, said, "Basically this program called for in the Senate bill provides financial assistance for debt payments, incentive payments, and conversion payments to support just the kind of things the conference is concerned with. The important point is that there is some recognition here that there ought to be financial support to stimulate institutions to look at the problems of excess capacity—and to begin making adjustments."

▪ Facility design evaluation

Methods need to be developed to evaluate the *potential* for reuse projects—and the quality of the completed work. A logical strategy requires that explicit criteria be established about that potential as well as a scale of value for judging architectural design as it enhanced, or effaced, the quality of the buildings that existed in the first place. Even successful reuse projects often seem to relinquish a certain warmth and human scale, and design professionals must investigate new ways of dealing with these related challenges of "the facts" and "the feelings" of an environmental situation. It is not enough to focus on the limited area of codes, mechanicals, and engineering services in evaluating the reuse potential of a facility. Again, code enforcement must be more flexible for older buildings, encouraging innovative design approaches; in turn, the design professional must be more than casually attentive to the life-safety, and related, the *intent* of the codes, just as he must be to the urban-design and amenity incentives of zoning, so that, in command of such "constraints," he can speak the language and have a better chance of doing more creative, considerate design.

But this component of the conference was cautious about acclaiming just any reuse, retrofit, or reconfiguration process just because it happens to technically, functionally, and structurally address a trend and a national need. As architect Richard Sonder of Russo & Sonder put it, "In creating a new facility, we add to the pre-existing world, and it is the addition that has impact, that changes the world for better or worse. When recycling a building, we happily do not add to the world, so the disruptive dangers are lessened. But, instead of adding, we *select,* and that selection can be good, bad, or indifferent. Of the available building stock, only the most appropriate building, or portion of a building, must be selected. The building thus preserved should have been a good one originally. The passage of time should not now render it into an anachronistic aberration. It would be a double sin to prolong the life of a structure that was harmful in the first place—we should know when to pull the plug."

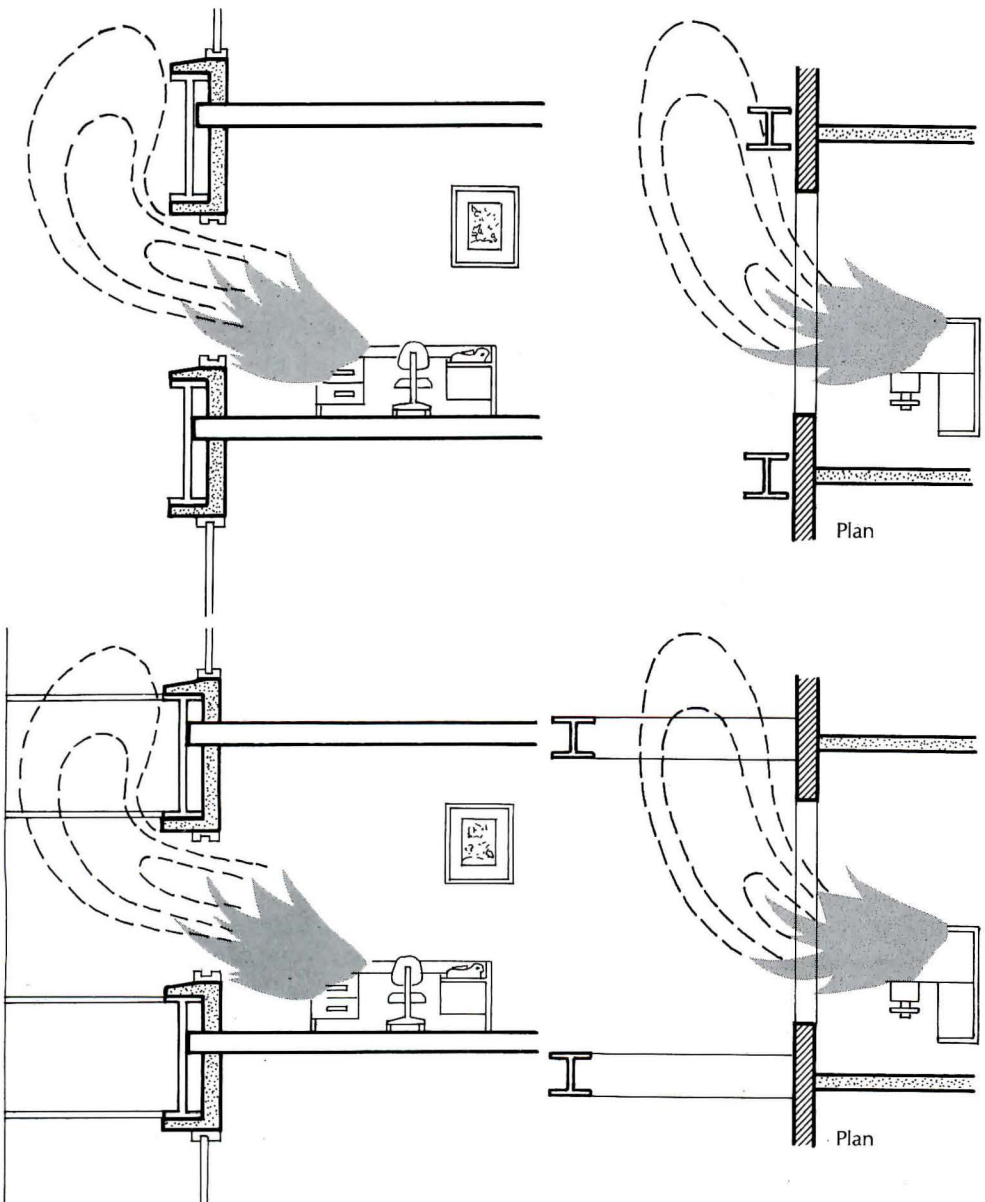
If America's existing health-care facilities are to give a helping hand—not least of all to the fulfillment of architectural and urban-design values—*selectivity* is the bench mark consideration. If an existing building has skill, style, and an engaging scale, enhance them; if it has none worth enhancing, the designer can be freer to recast it with wholly new character. In either case, the design professional must understand, and respect, that what he does, by way of reuse, can range across the board of a community's identity, image, social values, and economic vigor. As William Parker summed it up, "We sent some flags up at Columbia. We cannot do health planning, or encourage the reuse ethic as an integral function of it, and ignore their impact on the general well-being of communities. There are all kinds of approvals—the certificate of need being just one; there are all kinds of success—the ability to service debt being just one. Design quality is not incidental to securing, more than efficient, ample resources, buildings that engage the pride, confidence, and imagination of everyday people, whether patients or not."

AISI publishes a simple, rational method for predicting fire safety of exposed steel

A new rational fire-protection design procedure for exposed columns and beams at building exteriors is being introduced to architects and engineers in a series of six seminars across the country beginning this month. Commissioned by the American Iron and Steel Institute, the procedure is called *FS3*, signifying "Fire Safe Structural Steel Design Method." The format is a step-by-step series of calculations that enables building designers to determine the maximum steel temperature during a fire at any location on a structural member located outside a building. With this information, designers can predict whether a bare column or beam will maintain its structural integrity if a fire of a presumed severity occurs.

Institute spokesmen state that with this method architects and engineers can now design for steel fire safety in the same analytical manner that they design for structural safety. The important implication is that designers and owners should not have to resort to prohibitively expensive fire tests. An understanding of fire protection requirements also should help architects make aesthetic decisions. The method has already been accepted by the EPCOT Building Code that governs Disney World near Orlando, Florida, and will apply to the Experimental Prototype City of Tomorrow (EPCOT) that is scheduled to open by October, 1982. Furthermore, the Southern Building Code Congress International is reviewing the application for a Compliance Report filed by the American Iron and Steel Institute (AISI). AISI notes that since three model building code groups—SBCC, BOCA and ICBO—now have a procedure, through the Council of American Building Officials, by which each of them can issue approval based upon staff work of any one, SBCC approval could pave the way for approval by all.

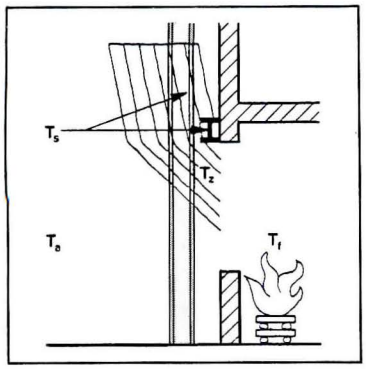
Columns can be made safe by locating them away from the hottest part of the fire. Spandrels can be protected by insulating their flanges.



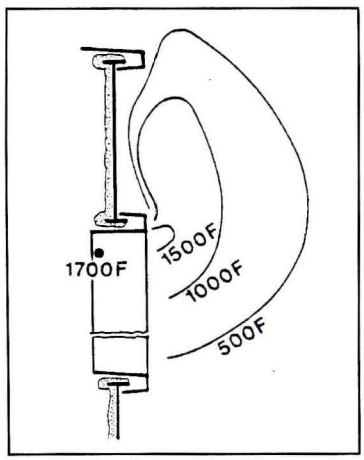
In the past, some structures such as major railroad stations here and abroad were able to use exposed steel because fire load was moderate, and the roof structures were protected by height above the floor. But in the last 10 years at least 30 buildings—many of them office buildings—have been designed with exposed columns, beams, and lattice and other types of frames—with reliance upon separation (i.e., distance from windows), shielding, and liquid-filled columns to prevent higher-than-acceptable temperatures were a fire to occur inside the building at the perimeter. The problem has been that for some of these new buildings it was necessary to conduct expensive tests to obtain a relaxation of code requirements. The developers of the new design approach say that it not only eliminates the need for such tests, but permits analysis of sizes of fires well beyond the limits of practical fire tests.

The conventional fire test does not mirror actual fires in at least two respects

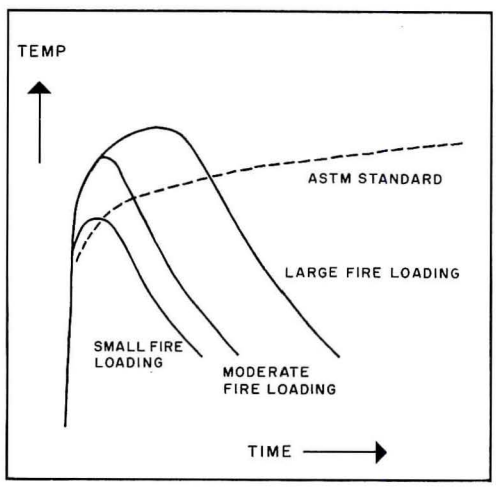
Currently, codes require structural members to have fire ratings of 1 to 4 hrs tested according to ASTM Standard E119, which has as its basis a time-temperature curve that was adopted in 1918, and was intended to represent fire severity likely to occur in the complete burnout of a brick, wood-joisted



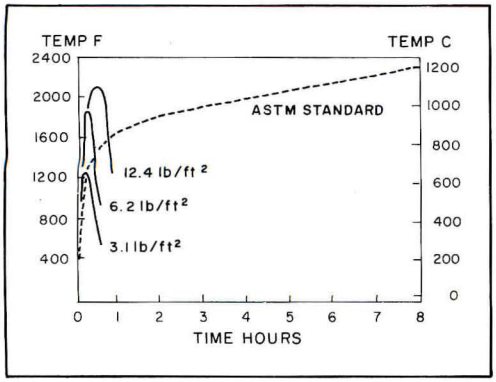
The temperatures that designers need to be concerned about are those of the fire, the flame, the outdoor air, and the steel.



Temperatures and flame projections that occured during a fire test to prove the fire safety of an exposed, but shielded, spandrel girder for One Liberty Plaza are shown above.



Fire researcher L. G. Seigel suggested 10 years ago that severity of fires is like the solid lines in the top graph, rather than the ASTM standard. Real fires burn hotter, faster (bottom graph).



building. While internal structural elements are exposed to conditions similar to those of the standard fire resistance test, the external condition is much different than this. Furthermore, tests here and abroad have shown that all fires burn at higher temperatures and for shorter durations than indicated by the standard time-temperature curve. Fires in perimeter spaces with windows burn faster and cool down faster because they are ventilated by outdoor air after glass breaks. And though building fires may burn for some time, they do not burn at a high intensity at any one location for very long. Structural steel members outside buildings are exposed to radiation and convection from the outflowing flames and gases, and to the radiation from the room itself; but these members also lose heat to the surroundings at outdoor air temperatures. It is possible, therefore, to locate these structural members far enough from flames and compartment fires, or to shield them, so that conventional types of fire protection are not needed.

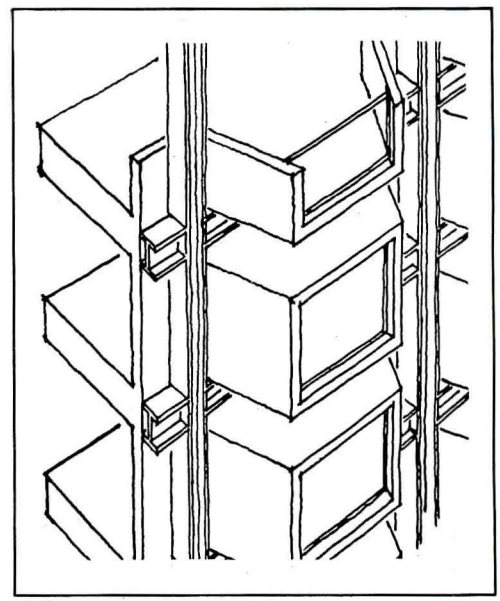
The new design method is based on years of tests plus thermodynamics

In the past 10 years a number of *ad hoc* tests have been conducted in the U.S. with structural steel members exposed to "real" fires to obtain waivers from building code requirements so that steel could be used without conventional fire protection cladding. And experiments on fire effects on exposed exterior steel have been going on in this country and in England, Germany and France over the last 15 years. Tests on flame characteristics have also been conducted in Japan. One of the *ad hoc* tests referred to was run to prove that exposed steel spandrels with flame shields over the flanges could be used for One Liberty Plaza in New York City (see RECORD, September 1969 and July 1973). The maximum temperature reached by the bare web of the spandrel beam was 640 F at 16 minutes after the start of the fire—well below the limit of 1100 F for structural steel beams.

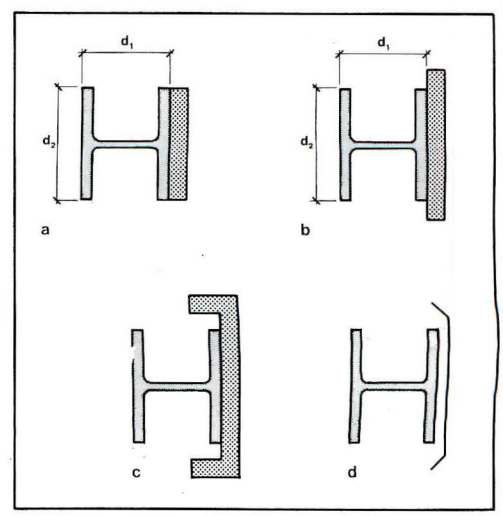
All these tests, however, did not add up to a design method. Still to be developed were the mathematical thermodynamic relationships that a building designer could use with confidence to predict maximum steel temperatures in a fire—in a form that they could understand and use without difficulty.

The circumstance that prompted the development of a design manual was an actual—and difficult— design problem. Ove Arup & Partners—the well-respected English structural engineers—needed an analytical approach for determining potential fire hazard on Piano and Rogers' Centre Pompidou in Paris (RECORD, February, 1978). Since all columns and their cross bracing and lattice girder connections were outside the building, analytical proof of the system's fire integrity was required. Coming up with the analytical proof fell on the shoulders of Margaret Law, senior fire engineer with the Ove Arup organization, who contacted the American Iron and Steel Institute during the course of her research—and through this work AISI became interested in developing a designer's manual. In 1974 Ove Arup & Partners was commissioned by the Constructional Research and Development Organization of Great Britain (CONSTRADO) to prepare a detailed report setting out the most plausible models of flame projection from openings in building facades, and the methods of calculating heat transfer from fires to external unprotected steel columns. The following year, a major extension of this work was commissioned by the Fire Technology subcommittee of the American Iron and steel Institute, supported by the Committees of Structural Steel and Steel Plate Producers. The objectives were: 1) to prepare a manual for designers that would give straightforward design rules together with design graphs and tables for detailed analysis of proposals, and 2) to prepare detailed reports on a) the state of the art of completed research and testing, and b) the most plausible models for fire behavior plus supporting evidence for the design manual.

The Ove Arup Designer's Manual is a 70-page document detailing the method for the rational design of exposed exterior steel. To make the manual more concise and easier



Two basic approaches for protecting exposed steel from fire are shown conceptually here: at top, the projecting bays keep fire away from the exposed columns and spandrels; at bottom are four types of column shields, insulated or uninsulated.



to use, AISI worked with the University of Maryland Department of Fire Protection Technology to prepare a convenient, step-by-step calculation-sheet format for their *FS3* Designers Manual. At present, the designer's manual contains calculation sheets for determining column temperatures. A set of calculation sheets for spandrel beams will be available in the near future. AISI also plans to develop a computer model that will permit the quick manipulation of the many variables involved so that more tables can be made available for rule-of-thumb limits for preliminary design (some tables are included now). The computer model also could be used for computer graphics.

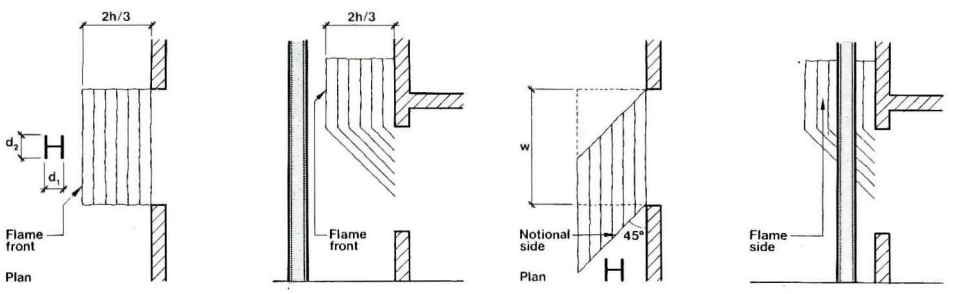
Three basic variables determine whether the steel can be left unprotected

What are the variables that the designer has to consider? They are: 1) the temperature of the fire within the room (compartment), 2) the flame shape and temperature, and 3) the location of the structural steel member. The temperature of the fire in the room or compartment depends upon the fire load, the area of the compartment, the area and height of the window area. The flame shape depends upon a number of factors, but principally upon the rate of burning, and the area and the height of the window area. The distance of the flame away from the facade depends upon the shape of the window and whether or not there is a wall or only a parapet above the window. A flame will be projected away from the facade only if the air can get behind it. With a narrow window, or a number of windows with a parapet above, the cool air from above or from the sides can more easily get behind the flame and deflect it outwards. Conversely, with a wide window or a number of windows with a wall above, the flame will stay close to the facade. Furthermore the flame will be pushed out if there is forced ventilation created by windows on the opposite side of a compartment, or from some other source.

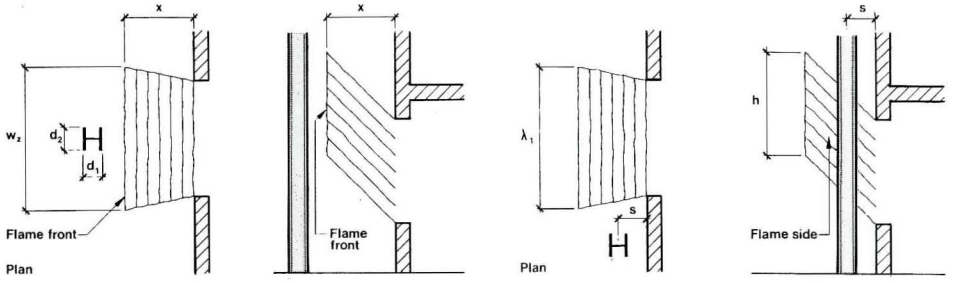
The flame temperature depends upon the depth and width of the compartment, the area and height of the window area, and upon the rate of burning.

The significance of the location of the exposed structural steel column with respect to the flame is that the convective and radiant heat transfer will be affected. Convective transfer takes place only if the column is engulfed in the flame. Radiant exchange is affected by how much of the flame the column "sees" which is governed by the location and the orientation of the column with respect to the flame; this is known as "configuration factor."

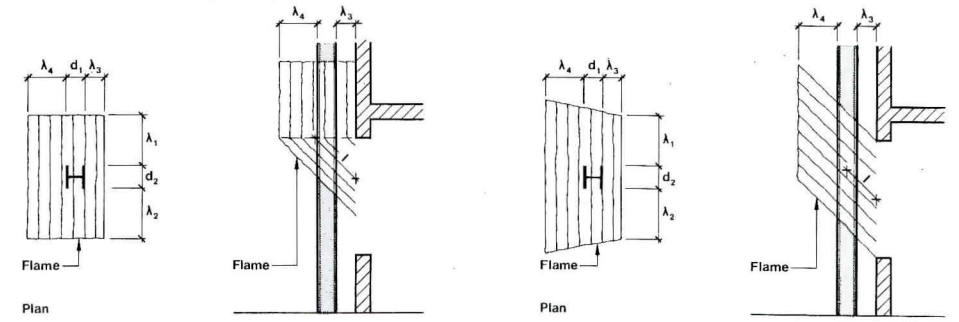
The steps the designer must take, then, include: 1) determination of compartment and window areas and fire load, 2) determination of flame shape for no through draft or for draft conditions; 3) drawing of flame shape, 4) determination of configuration factor, 5) determination of steel temperature for a column engulfed in flame, for a column to the side of the window, or for a column in front of the window not engulfed in flame. If



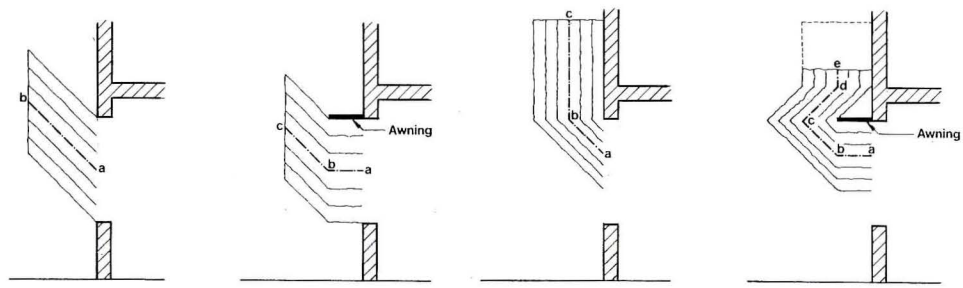
Fire fed only by natural draft can be assumed to have a flame width equal to that of the window, and to hug the wall if there is a wall above. The flame emerges from the upper two-thirds of a window, with cold air being drawn in below. Wind is assumed to move the flame no more than 45 degrees laterally.



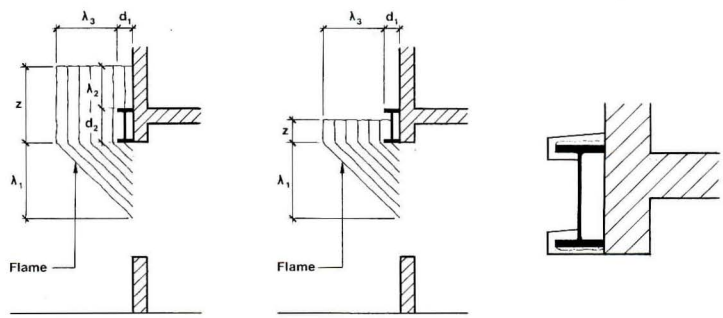
With forced draft, flame spreads out wider than the window, emerges from all the window area, and projects beyond the wall. The designer can assume different locations and distances from windows for the columns and calculate the steel temperature during fire at each place to see if it is lower than "critical" (1000F).



The worst case is the column engulfed in flame, and gives the designer an indication of the severity of the fire with the design parameters he has chosen. If the column is left in this location it may require shielding as shown across page. Both natural and forced draft flames are illustrated.



An awning or balcony at the head of a window deflects the flame and changes its shape, projection, and effective height. The forced draft situation is shown at left and the natural draft situation is at right.

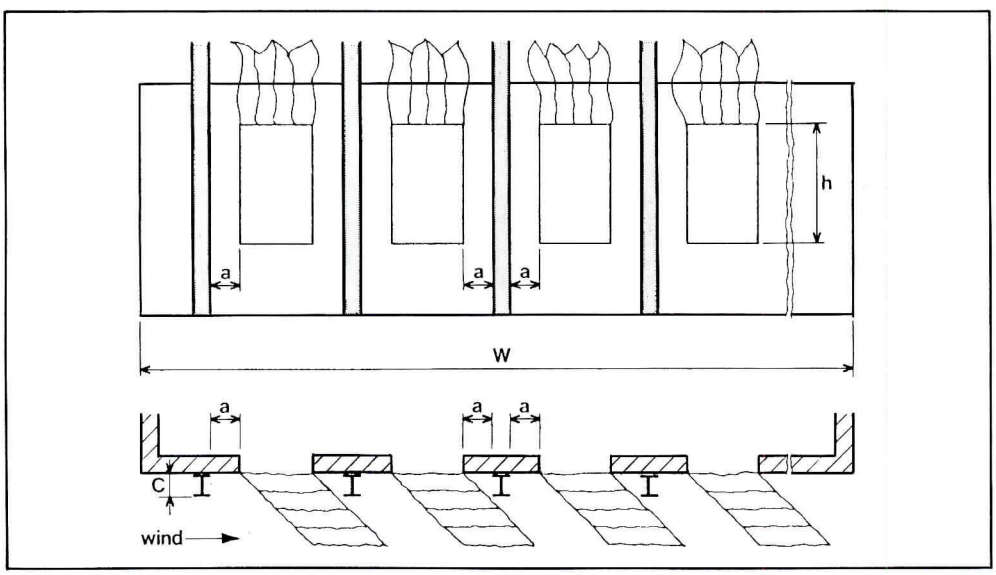


When the spandrel beam will be engulfed in flame, three different conditions are possible (as shown) and can be analyzed. For columns, the flame temperature was assumed to be the same all around the section. But with spandrel beams the temperature at the lower flange may be sufficiently different than that at the top flange to make it advisable to calculate both conditions.

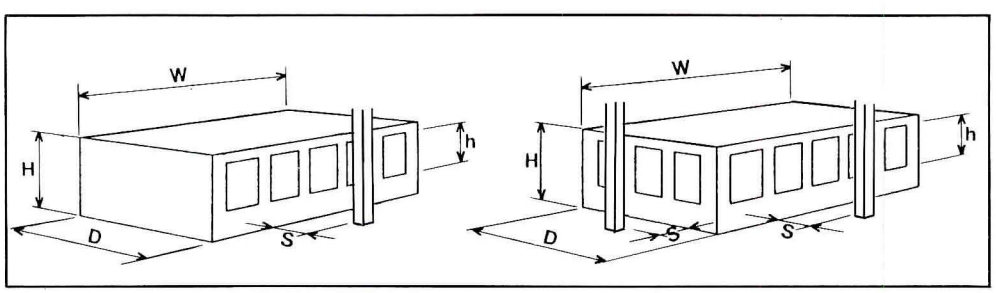
the temperature of the column is less than the critical temperature of 1000 F, then the design is safe. If it is greater than this then the design must be revised. The designer has the option of: 1) moving the position of the steel in relation to windows, 2) introducing or modifying flame shields, 3) preventing through draft conditions, or 4) altering compartment dimensions, window arrangement and shape, or fire load.

Two aspects of temperature of steel need to be considered by the designer. First of all, the load-carrying capacity may be reduced because of reduced strength at high temperatures. But also, when the structural members of a building are heated, they expand and may develop forces and moments that are not usually taken into consideration in the building design.

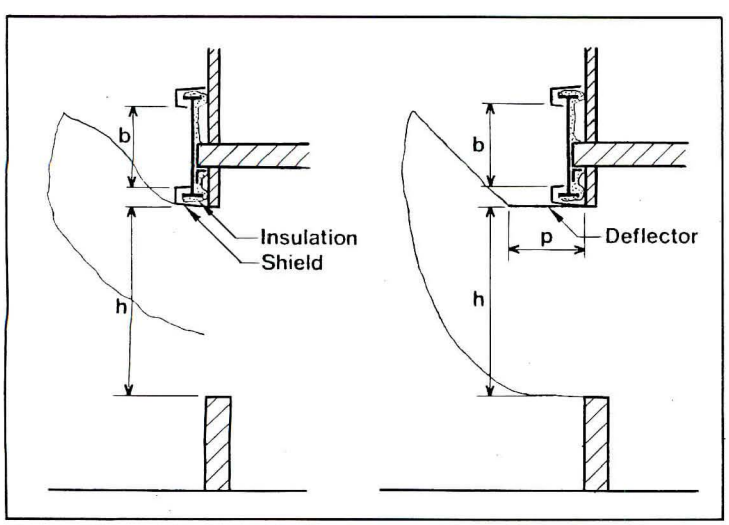
Columns located outside an opaque, fire-resistive wall have no fire exposure, so these columns do not need protection. Columns outside a wall of fire-resistant glass would be exposed to the radiant effect of the fire on the inside. Columns outside windows with ordinary glass may be engulfed in flame once the glass breaks from heat, but even this situation is not as severe as that of interior members because these columns are in the open air.



Tables for rule-of-thumb location of fire-safe columns are included in the AISI designer's manual. For example, the distance of columns from windows is 8½ ft for a compartment width of 60 ft and a window height of 3 ft. If the window height is raised to 6 ft, the columns need be only 3½ ft from the window.



For columns opposite windows, and with windows on one side of the compartment, columns need to be 11 ft out from the wall when glass is 50 per cent of the wall, windows are 6-ft high, and the compartment is 30-ft deep 60-ft wide and 12-ft high. With windows on two sides, spacing is 8 ft.



For spandrel beams with shielded flanges, the rule-of-thumb table gives a minimum web height of 3 ft for a beam over a 4-ft-high window. For a spandrel beam with flame deflector and through-draft conditions, the ratio of minimum deflector width to web height for a 4-ft-high window is 0.9.

more information, circle item numbers on
ader Service Inquiry Card, pages 213-214

ew pharmacy equipment offers flexibility

new furniture system to ovide an organized working vironment for every part of hospital's pharmacy operan has been designed by rman Miller, Inc. It provides interchangeable modules medication storage, retrieland transportation by armacists.

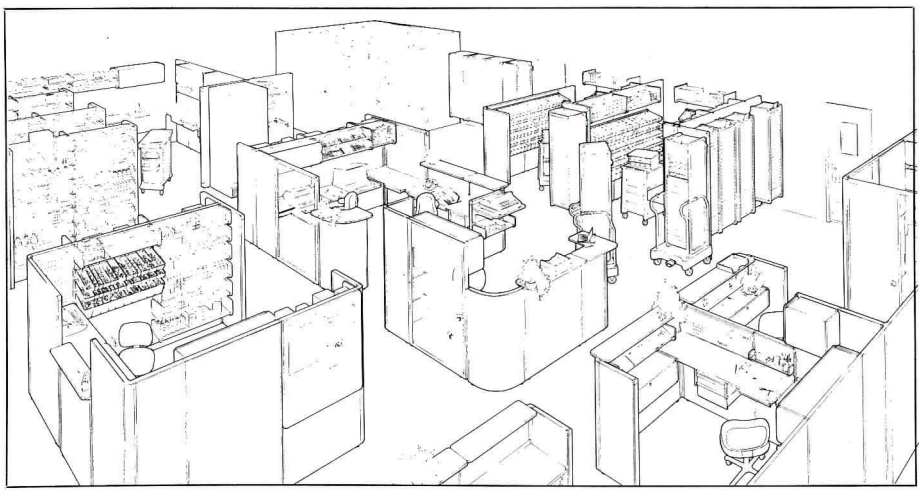
A variety of components own top right and in use ht) can be specified accordg to individual hospital and armacy requirements. Inuded are lockers, working ations, drawers and carts. Picking rails" (dispensing its) can be attached to the armacy's walls or used as ee-standing panels. The bins ntain enough medication to tisfy 90 to 95 per cent of a spital's order volume. The its can be positioned for nvenient access in any size room.

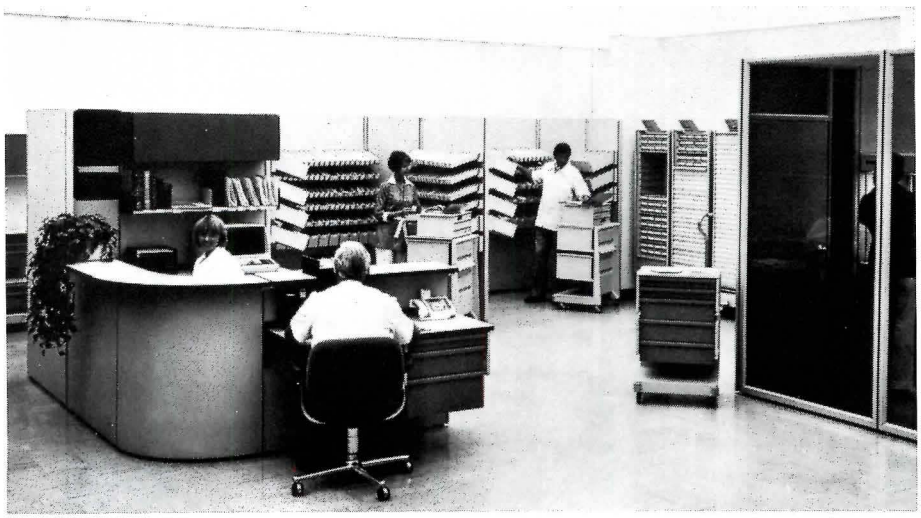
Mobility is a key feature. Carts and lockers can be packed in the pharmacy and delivered to any area of the hospital. Lockable units are available for use as narcotics storage and delivery.

An integral part of the system are the cassettes, which can house four, eight or twelve patient drawers.

Introduced this month for the general market, the system has been tested at the Mesa Luthern hospital in Mesa, Arizona. The prototype set-up has offered a "better utilization of space", according to the hospital's Director of Pharmacy. "The modularity and interchangeability," he continues, are the keys to the system. ▪ Herman Miller Inc. Zeeland, Michigan.

circle 300 on inquiry card





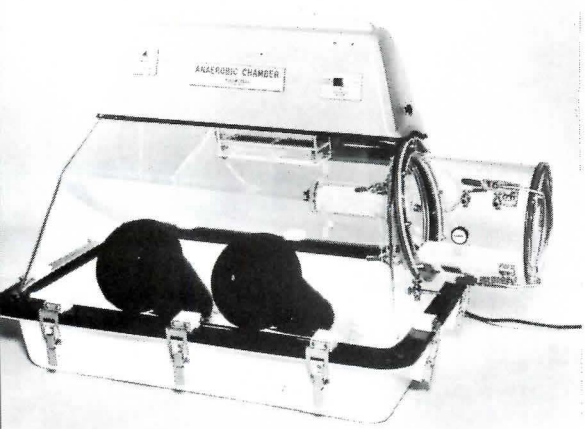
naerobic chamber available for hospitals

new anaerobic chamber for owing bacteria and cultures s been designed to be selfntained, compact and porble.

The key parts of the system e thermoformed from ½-in.-ick acrylic plastic because of e inherent material qualities r insulation, durability, and ear moldability for appearnce. The vacuum or transfer amber is also constructed of ½-in.-thick acrylic.

The main features of the system include: transfer chamber, moisture status indication canister, primary dessicant canister, catalyst chamber, quick disconnect shut-offs, removable leveling tray and an interchangeable pump system. ▪ Plas-Labs, a division of Plastics Manufacturing and Supply Co.

circle 301 on inquiry card



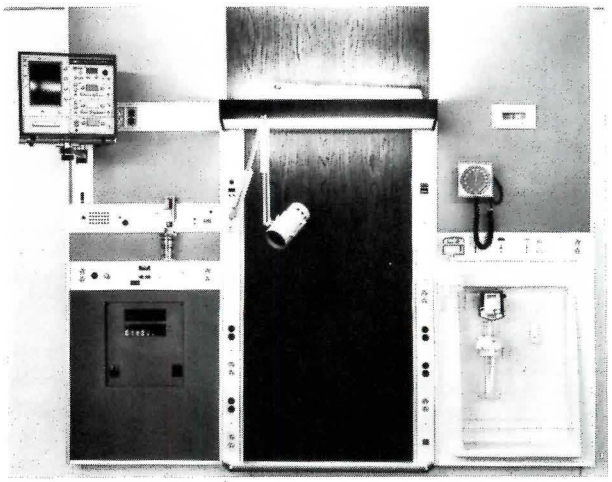
Medical care walls available for ICU/CCU areas

"Vistacon" is a prefabricated wall system, in one or several lengths of modules, designed specifically for intensive care and critical care units (ICU/CCU) in hospitals. Each module provides for patient care service outlets and equipment in a variety of configurations to suit the room requirements. Services may include electrical devices, medical gas outlets, communications and monitoring equipment, general and examination lighting.

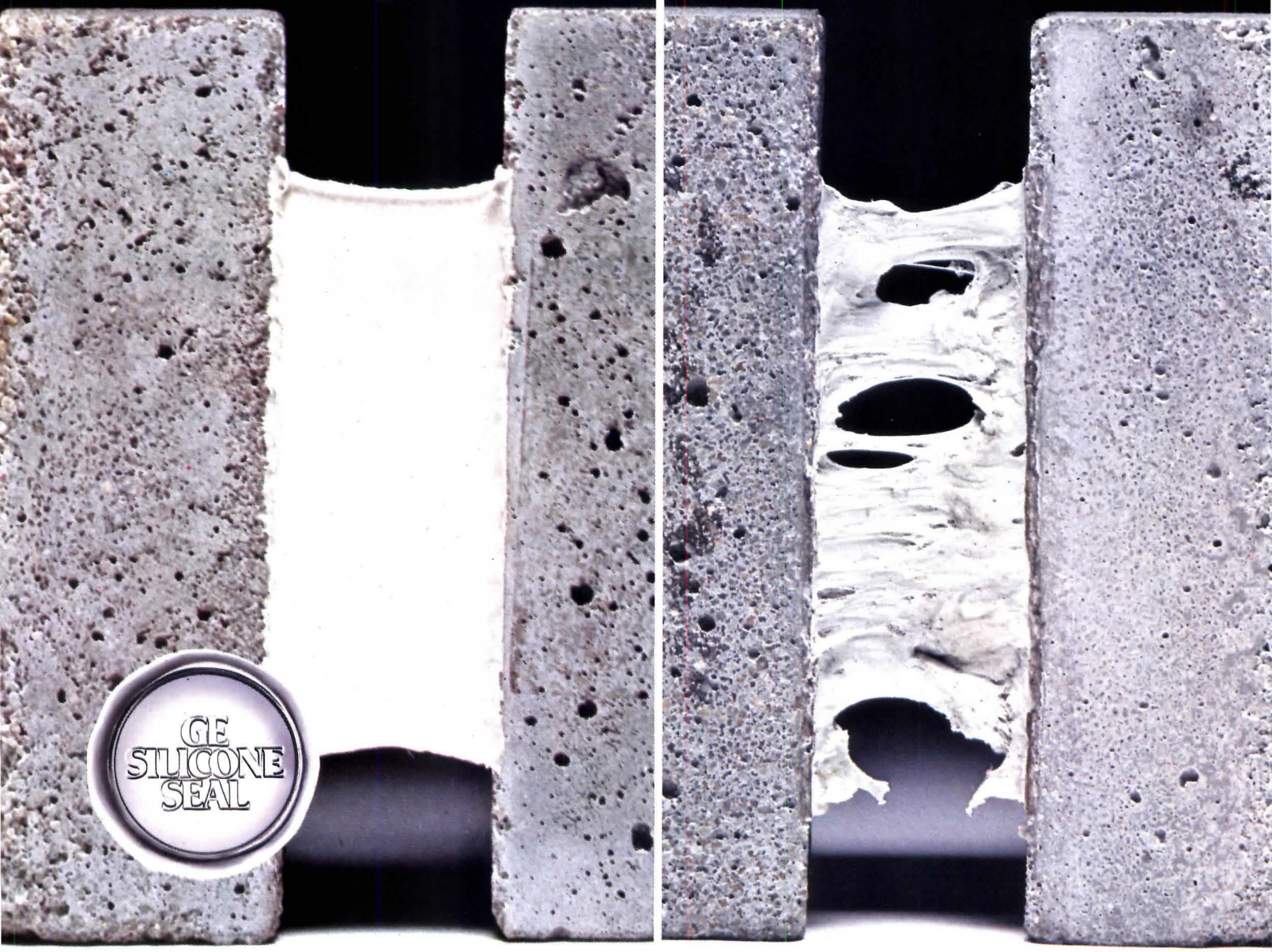
The system is available in a variety of colors and wood grain patterns. The service walls can be surface-mounted to existing walls or recessed flush-mounted in new construction. Exposed surfaces are of plastic laminates and anodized aluminum. All electrical components are UL listed and the walls conform to the applicable standards of UL, NFPA and NEC. ▪ Chemetron Corporation, Chicago, IL.

circle 302 on inquiry card

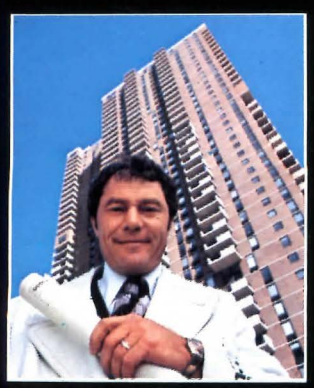
more products on page 163



The GE Silicone Seal. The difference between a weathertight seal and a call-back.



Silpruf™silicone sealant and non-silicone high-performance sealant samples in GE lab test.



Architect: David Todd Associates, New York.
General Contractor: HRH Construction Co., New York.
Waterproofing: Jobin Waterproofing Corp., Farmingdale, N.Y.

General Electric silicones make quality performance sealants that virtually eliminate costly call-backs.

Just ask Robert J. Capazzi, President of Jobin Waterproofing Corp., who used GE silicone sealants for New York's new 1,700 unit Manhattan Plaza: "GE silicone sealants deliver reliability that reduces call-backs to just about zero. With other types of sealant, call-backs have cost me as much as $2,000."

That's because other sealants don't perform like GE silicones. With strong, flexible, weathertight bonding that, in some grades, withstands extension/compression cycles of ± 50%. With superior resistance to extreme temperature swings, wind, rain and ultraviolet attack. With excellent adhesion to properly prepared surfaces.

Manhattan Plaza required over 200,000 linear feet of sealant, *including* masonry-to-masonry, metal-to-masonry and metal-to-metal. Bob said, "In each instance, GE silicone sealants performed beautifully, and that meant more profit at the bottom line. Period."

For full information, contact: Section 444, Silicone Products Dept., General Electric Co., Waterford, N.Y. 12188.

GENERAL ELECTRIC

Circle 61 on inquiry card

For more information, circle item numbers on Reader Service Inquiry Card, pages 213-214

GLAZING SYSTEMS / A 16-page illustrated booklet discusses architectural guidelines for glazing systems, using three-dimensional detail drawings to demonstrate specific glazing recommendations for wet, wet/dry, and dry system configurations. Information is given on surface preparation, use of shims and spacers, clearances and glazing tape compression; glazing of plastic sheets is also covered. ▪ Tremco, Cleveland, OH

circle 400 on inquiry card

DOOR AND WINDOW CATALOG / A new *Perma-Shield* gliding door with improved energy conservation features is included in this manufacturer's full line, 52-page window and door catalog. Vinyl-sheathed windows and gliding doors in both white and "Terratone" color, and primed wood window and gliding door units are also presented in the detail book. ▪ Andersen Corp., Bayport, MN

circle 401 on inquiry card

INDUSTRY STANDARDS INDEX / A second edition of the "Standards Cross-Reference List" is now available. A 128-page book, the publication cross indexes 82 agencies such as ASTM, ANS, SAE, NEMA, IEC, etc., and is intended to assist researchers in locating specific voluntary standards which are assigned new designations by each agency adopting them. It is available for $10.00 (prepaid), $12.00 (invoiced) from the MTS Systems Corp., PO Box 24012, Minneapolis, MN 55424

LABORATORY FURNITURE / A 44-page catalog explains the advantages of modular "System 55" laboratory furniture. Designed to meet a number of technical requirements, the casework units can be moved or rearranged at any time to conform to changing workloads. "System 55" features steel framework and a complete selection of countertop surfaces, sinks, plumbing and electrical fittings, seating and accessories. Literature discusses the laboratory planning services available. ▪ Forma Scientific, Marietta, OH

circle 402 on inquiry card

TILT-SASH WINDOW / A product data sheet introduces the "Model 127" tilting sash custom-fit replacement window. Aluminum frame unit is made with single glass for installation with storm windows; or with double-glazing. ▪ Season-All Industries, Inc., Indiana, PA

circle 403 on inquiry card

DRAFTING TABLES / Marketed for home use by professionals or students, the "Oak-Lin" drafting and art table line is 30½-in.-high, for use with a conventional desk chair. An illustrated bulletin shows how the easy-to-assemble table folds flat to a depth of 6-in. for storage. Said to be economically priced, the "Oak-Lin" table is constructed with a base of northern oak, and a basswood or vinyl work surface. ▪ Teledyne Post, Des Plaines, IL

circle 404 on inquiry card

LETTERING MACHINES / A color product folder answers "8 of the most commonly asked questions" about type-on-tape *KroyType* lettering machines. The units are said to be more economical than computerized/photographic machines, producing professional, reproducable letters for architectural plans, graphic art, etc. Two electric and one manually-operated *KroyType* models are offered, priced from $350 to $645. ▪ Kroy Industries Inc., Graphic Systems Div., St. Paul, MN

circle 405 on inquiry card

DECORATIVE CEILING / A four-page specification guide on the *Victorian* decorative suspended ceiling surface shows how the panels resemble the stamped tin ceilings in common use 70 years ago. Formed of a metallic vinyl material in three designs, the panels lay into a matching 2- by 2-ft grid system. *Victorian* ceilings are UL-approved for mounting below sprinklers; literature lists other code and test data and design criteria. ▪ Integrated Ceilings, Inc., Los Angeles, CA

circle 406 on inquiry card

COMMERCIAL REFRIGERATION EQUIPMENT / A piston action automatic door closer is one of the energy efficient features added to the *Nor-Lake* line of door assemblies for large refrigeration and freezer units. Product data sheet describes the closer, a thermostatically controlled anti-sweat heater system, and the doors' improved gasketing seals. ▪ Nor-Lake, Inc., Hudson, WI

circle 407 on inquiry card

FLAMMABLE LIQUID STORAGE / Illustrated bulletins detail two additions to a line of flammable liquid storage cabinets, all with self-closing doors. Doors fold to the left-hand side and are held by a latch; door will close automatically when latch is released manually, or if high ambient temperatures melt a fusible link release. Cabinets are finished in yellow baked enamel, and labeled as to fire hazard; 30- and 45-gal capacity units meet NFPA and OSHA requirements. ▪ Lyon Metal Products, Inc., Aurora, IL

circle 408 on inquiry card

BUILDING SYSTEMS / A catalog insert describes an energy efficient metal roof and wall system, the "VP300". Available with polyurethane insulation cores from 2- to 6-in. thick, and R-values from 14.0 to 42.0, the panels are faced on both sides with 26-gauge embossed steel with a baked enamel finish. Tongue and groove sidejoints help assure thermal integrity; drawings show typical corner and ridge details. ▪ Varco-Pruden Metal Building Systems, Memphis, TN

circle 409 on inquiry card

WATER DEPOSIT ANALYSIS / Brochure explains the use of an X-ray fluorescence spectrometer and other sophisticated tools to provide accurate analysis of deposits from boilers, steam or condensate lines, and cooling water systems. Qualitative and quantitative analysis of hardness compounds or corrosion products is available about three days after the Total Water Management Analytical Laboratory receives the water samples. ▪ Mogul Div., The Dexter Corp., Chagrin Falls, OH

circle 410 on inquiry card

BOOSTER HEATERS / Maximum performance in minimum space is claimed for two electric booster heaters designed to supply sanitizing rinse water for dishwashing operation is hospital cafeterias, etc. Brochures on the "Countermount" of "Super 20" water heaters list such optional features as ASME tank construction, stainless steel jacket, low water cutoff and fusing. ▪ A. O. Smith Corp., Kankakee, IL

circle 411 on inquiry card

HIGHPRESSURE LAMINATES / Color brochure describes the "Design Group I" collection of postformable laminated plastics for residential office and commercial applications. Patterns include 108 solids, designs, woodgrains, marbles, slates and textured leathers. ▪ Wilsonart, Temple, TX

circle 412 on inquiry card

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GRAPHIC SYSTEMS DIVISION
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St. Paul, MN 55109

Circle 62 on inquiry card

hundreds of lesser failures, many of which even the owners are only vaguely aware—undesirable building noises that one becomes accustomed to, structure sway that occupants assume to be "necessary," automated building systems that just never seem to get all the bugs worked out, inappropriate boiler location design requiring that a wall be knocked out to blow the tubes, communication systems far short of intended utility, etc., etc., *ad infinitum*.

In part the failings result from A-E people who are really over their heads in certain design aspects but reluctant to acquire the readily available and relatively inexpensive consultation needed in certain areas. The "competitive spirit" compounds this lack with a failure to specify explicitly the exact performance and/or product wanted for a particular application. And the series breaks down completely when the A-E fails to fully enforce what may have been an initially good specification, taking instead that presumably "equal" voluntary alternative—without a completely honest evaluation by knowledgeable people (i.e., expert consultation).

Where does the fault lie? Again, the answers are no more simple than the problems. Each equipment peddler has his own drum to beat, and each is somehow superior to his competitors; the one with the better salesmanship is the more likely to prevail—but superior salesmanship is not a reliable measure of system adequacy (and may, in fact, be highly correlated, negatively). "Lowest and *best*" bidder, with all sorts of bid prequalification requirements, almost always finds the awards given to bidders who, most emphatically, are not the "best"—the best costs a little more, and the bottom line usually dominates. About all that survives from this process is an escape mechanism to throw out some bidder that the A-E or owner has had a particularly bad experience with at some time in the past.

It would be safe to say, I believe, that, next to the original design drawings and specifications, one of the most important parts of the building process is bid evaluation—and considering the length of time devoted to it, it is quite obvious that this aspect does not receive the emphasis it should. We have seen many systems with a multiplicity of bidders where "something wrong" is quite obvious. Typically, three or four bidders will be within less than 3 per cent of one another, then there will be a huge gap and another cluster of three or four bidders within a few percent of one another, and finally another large gap with a few bidders closely spaced. It is quite obvious that they simply cannot be bidding on the same basis. Omitting estimate errors, and there are always some such errors, equal-quality equipment prices are not grossly different from different suppliers; labor time and rates are always an educated guess, but shouldn't vary significantly between different organizations bidding on the same work. Only overhead and profit are left for much variability, and any contractor who has been in the business very long is pretty well aware of his true overhead costs and the minimum profit margin he can get by on—and he is also aware that he cannot afford to pad the estimates if he expects to get the jobs. A proper bid evaluation could precisely determine the reasons for the range of bids and decide which of the three groups was on the right track—maybe, just maybe, it was the high-bid group that had the concepts right. If so, that low bidder is either going to lose his hat, spats, and prat, or he is going to provide a system that isn't adequate—and if his submittals were approved, the A-E has little recourse.

There are, of course, many other causes of the failures. The ones mentioned here are those that are the most visible to people operating at the second and third tier subcontracting levels, an area from which your more astute readers may be too far removed to be fully aware of.

Billie J. H. Abraham
Communications Engineering, Inc
Indianapolis

In your editorial "Too many troubles in too many buildings: Why don't we start talking about what to do?" (September 1978, page 13), you ask for thoughts and comments.

Engineering science at present is at such a level that the strength of materials produced, the deformation of a structural element or system under any known loading it may be subjected to, and its stability and carrying capacity can be computed with sufficient accuracy so that any conceivable project can be carried out with reasonable safety and quality. Now, why the deficiencies and failures?

There is no need for special research or round table discussions to answer this question, because any engineer or architect with up-to-date knowledge and experience knows the answer.

The design of contemporary buildings or structures is rather complex, and their design and structural analysis require the application of advanced theories and knowledge rather than some "accepted" approximate methods.

Commonly, stresses under loadings given in codes are used as the only criterion. The other criteria—deformations (elastic and plastic) and ultimate loadings—are mostly overlooked, mainly because the computations are rather complicated,

continued on page 155

Tamarac 512

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Architect's Choice exceeds minimum standards for Federal, FHA, and HEW requirements as follows: F.S.-L.F.-001641, Class 1, Type III and FHA Minimum Property Standards for Single Family and Multi-Family Units. Exceeds HEW requirements under the Hill-Burton Act with smoke generation of 450 or less. Flame Spread ASTM E-84 Tunnel Test of 75 or less, Class B rating with 0 Fuel Contribution, UL subject 992 flame propagation index 4.0 or less.

Circle 64 on inquiry card

requiring advanced knowledge in mathematics, which most engineers don't have. Thus the reliance on computers without proper engineering judgment.

Usually a building is put together of a number of different elements assumed to behave structurally as a whole, which is not the case. A building has to be designed and analyzed from the very beginning as a whole to be able to act and behave as such.

If deflections—horizontal and vertical—are not computed for the most severe loadings, the ductility of a building cannot be determined. Ignorance of ductility leads to improper window installation, buckling curtain walls, cracking partitions, etc.

Each year hundreds of buildings subjected to dynamic forces or high water are destroyed because of inadequate design and the improper use of materials.

The responsibility for failures of course remains with the architects, but by their own doing. If one reads the specifications, he finds that everything specified—even structural shop drawings, the quality of materials, etc.—is subject to the architect's approval. Is there any reason why an architect willingly takes full responsibility for structural, mechanical or related failures and deficiencies?

Direct supervision, even for the most advanced buildings, is carried out not by the designers but by supervisors mostly ignorant of the peculiarities of the design and its structural behavior, during construction and after it is finished.

As a result, many buildings cry in agony even under normal loading conditions, and one should not wonder that failures occur under conceivable extreme loadings. The overriding problems are caused not by striving for extreme economy but rather by lack of proper education, experience and professional responsibility.

Dr. A. E. Kommendant
Engineer
Upper Montclair, New Jersey

As current vice chairman, and chairman-elect, of the AIA Committee on Architecture for Commerce and Industry (CACI), I feel a great responsibility and concern paralleling those expressed in your September editorial. And as a respondent to a lawsuit I term to be "frivolous," this office and I personally are concerned about both the future of this office and the future of the profession.

In this litigation oriented age, every professional must make every design decision with his priority based on legal consequences. There can be little doubt that many of us must give careful consideration to the greater advantage of closing out our practices rather than face the prospect of losing our entire life's gains of fortune (not much) and reputation (priceless) as a result of litigation too expensive to defend.

I believe practicing architects sincerely strive to serve their clients with excellent professional services. Those services continue to cost more and more, and the cost of construction continues to escalate—in large part out of the need to design in increased factors of safety, and to establish a fund for legal protection against litigation. More and more time is spent in peripheral activities aimed at protecting the professional; profits are deteriorating to the point of nonexistence. Competency is moving rapidly from that of becoming an excellent design professional to that of becoming an adroit manipulator of some design talent coupled with brilliant legal evasiveness. Your expressed theory that "buildings are being skinned down too tight and the safety factors reduced too far" is unquestionably too real to be only a theory. You are correct, further, "that clients are expecting more and more performance" and "more and more responsibility for that performance." In my practice, serving specialized industry, the so-called turnkey builder or package builder provides the major competitive threat. The unfortunate aspect of this competition is that the inherent problems, leading to potential litigation, often do not surface for extended periods of time. My wife constantly reminds me, when I point out to her a probable future failure, "It probably never will happen," and she is right. These kinds of risks are a type of Russian roulette; most of us won't play, but the opportunity is attractive to the uninitiated or the gamblers. During those periods of successful gamble, the competitive edge of the "skinned" project usually squeaks past the need for "responsibility for performance" long enough to lead to still further competitive deterioration.

(To be sure, there are many qualified, capable, ethical, reliable turn-key builders or package builders. The foregoing comments are related strictly to what I have observed in my own competitive atmosphere.)

There is another, and no less real, menace to good architecture. That menace pervades the United States and perhaps the world. The consumer movement probably had a righteous birth; it is its upbringing that has gone awry. Today's consumer has come to believe that the solution to every problem is to file suit against everyone in sight who may have something to do with the problem. Like the Federal debt, there appears to be a naive belief that "someone else" can pay. That someone else is everybody, and the citizens of this country need

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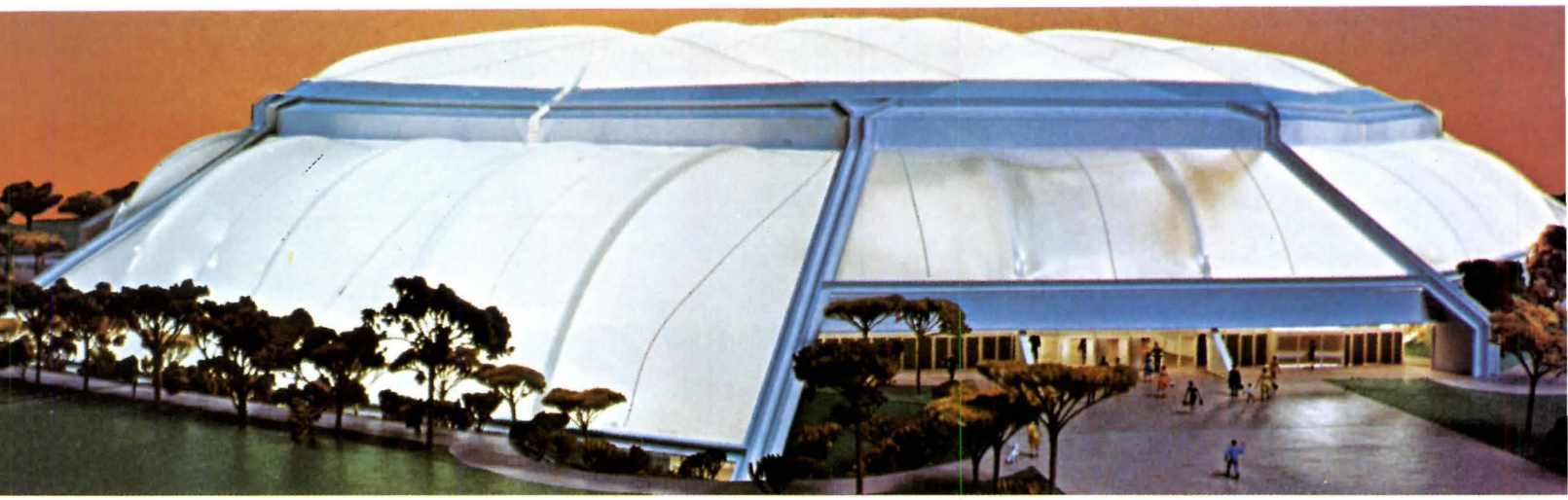

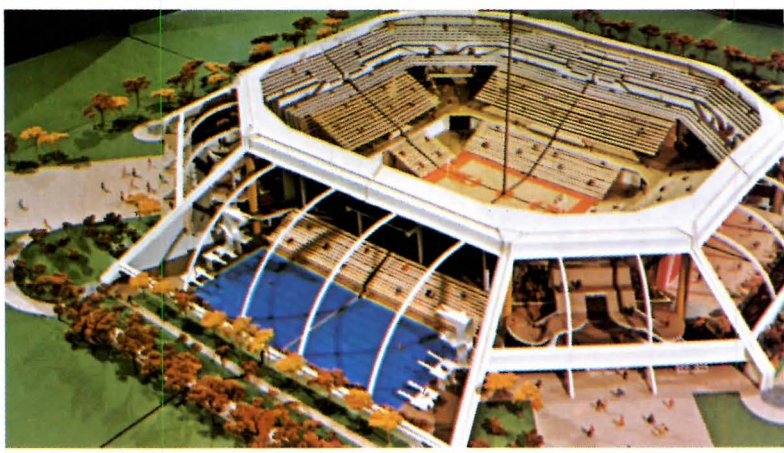

Model of proposed student activities center, University of Florida, Gainesville, Florida.
Architects: Caudill Rowlett Scott, Houston, Texas; Moore, May & Harrington, Gainesville, Florida.
Engineers: Geiger-Berger Associates, P.C., New York City.

Permanent fabric exterior removed from model to illustrate column-free interior.

The University of Florida at Gainesville needed a new student activities building. They wanted a basketball court, olympic-size swimming pool, high diving area, indoor track, court sports and gymnastic area, locker rooms and administrative offices. They wanted an attractive permanent building...not a temporary structure. And, they had the inevitable limitations of a budget.

The architectural firms of Caudill Rowlett Scott and Moore, May & Harrington met their needs by proposing a permanent building of architectural fabric coated with TEFLON® fluorocarbon resin. Pound for pound stronger than steel, the glass-fiber fabric can be supported by light air pressure or high strength cables providing large, clear spans without bulky, expensive supporting columns. Enclosed space is free and uncluttered. And the translucence of architectural fabric coated with TEFLON adds to the feeling of openness. It admits enough natural light to grow plants and carry on sports activities even on cloudy days. The new facility is designed to resist Florida hurricane forces.

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to learn that lesson as soon as possible.

If there weren't too many troubles in too many buildings, you wouldn't have needed to write such an editorial, I wouldn't have taken time to respond to your invitation for thoughts and comments, and both you and I would be devoting our energies to the more positive aspects of fruitful delivery of good architecture to America and the world.

Willis Regier, AIA
Omaha

P.S. The September issue is an outstanding information source!

Your September editorial strikes at the very heart of the erosion of architects' credibility. Over the years, we have permitted outside influences to encourage us to take the "easy way out." Now, although we are held legally and morally responsible for the entirety of the projects we design, the only quality universally admitted to being in the province of the architect is "esthetics."

The way we practice architecture day to day in our individual offices is considerably at variance with the way pictured by AIA and the public. Solutions to problems too often are based on individual experience notwithstanding the fact that other available experience can produce better results far beyond those of the individual. I recall one architect using a 20-year out-of-date material because it was the only product that would at one time solve his problem, notwithstanding the fact that now he has available a dozen better contemporary solutions. In actual practice the totality of individuals' inputs to design problems varies in direct proportion to the number of design firms.

It is always dangerous to use "always" in making statements. It is dangerous to attribute shortcomings or outstanding practices to an entire group, or any segment thereof. Invariably, you will be proven wrong. Let us say without fear of strong retribution that the "good" habits from "outstanding" design firms are not either disseminated, taught or accepted within the profession. It is distressing to see so many architects re-inventing the wheel and so many "young practitioners" charging out to change the profession to what they perceive it to be, whatever that is. We all did that—some more effectively than others.

The basic ingredient of our problem is the pride of our creative talents. Any suggestion that questions our artistic ability is generally poorly received. We feel that the result of our creativity is unique and is unalterable. We know that he who is criticizing or suggesting doesn't grasp the design concept, doesn't have the ability of the designer and doesn't have a brain in his head. We are all individuals, human and architects. Now, how do we overcome all that?

As an example of one way to make professionals more professional, CSI includes in its Code of Ethics the exhortation "to freely interchange information and experience with members of the construction industry." In my 23 years of CSI membership, I've seen this tenet applied more or less effectively. CSI still is the only group to apply this principle across the construction industry. We need much more of this interchange of information. Perhaps, as you suggested, an "off-the-record non-attributable basis" could be the start of an information reporting system. Government agencies should be able to provide countless lessons once the reporters and participants could be assured anonymity. The RECORD, AIA, or CSI could be a clearing-house, organizer, publisher and make this wealth of experience available.

If there is anything we need in today's atmosphere it is to abandon this "every man for himself" attitude. Forget the fact that you may be helping a competitor; try to improve the total profession. Each participant in any program of idea/problem interchange will most certainly gain more than his imagined "loss" to a "competitor."

Ray E. Cumrine, FCSI, AIA
IPG, Incorporated
Valdosta, Georgia

Your editorial in the September issue "Too many Troubles in Too Many Buildings" calls to mind an article I wrote entitled "Interaction Analysis, an Incomplete Technology" in 1976.

I'm convinced that many of these problems grow out of a failure to extend the design analysis far enough into what I term the "interaction of materials in an assembly." I've pursued this as far as I can in my own limited practice and am emphatic that it be done jointly by the architect and the structural engineer.

My approach works as far as I've been able to take it on my own (in a limited practice serving architects on minor-league projects). I think that if a general interest were aroused, the technique could be extended and well developed for big-league projects to everyone's advantage. The outgrowth has to come from a widespread interest and a demand for particularized research and study, organization of data and all else that is needed to enlarge a technology.

The subject is obviously very interesting to me. In fact I have a real hang-up on it.

William F. Erickson
Consulting Engineer
South Bend, Indiana

continued on page 169

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Medusa White . . . the Architect's moldable partner for creative architectural concrete, contributes much to an imaginative concept. With exposed aggregates and other surface designs, many unique effects can be achieved for exceptional richness in color, shape and texture. Precast units in the two attractive buildings shown were made of Medusa White with white quartz exposed aggregates.

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Upper Marlboro, Maryland
Architect: Lawrence & Grimm
Adelphi, Maryland.
Precast Producer: Exposaic Industries
Fredericksburg, Virginia. APA.

Allstate Insurance
Farmingville, L.I., New York.
Architect: Michael Harris Spector, L.I., New York.
Precast Producer: Art Cement Products Co., Inc.,
Willbraham, Mass.

Offices opened

DCT Design Associates announces the opening of their office for the practice of architecture and planning at 508 East Main Street, Lexington, Kentucky.

Marcel Freides and Enrico Plati are forming a new architecture and planning firm located at 1825 North Lincoln Plaza, Chicago, Illinois.

Carmen Vincent Gintoli has started a new practice located at Redoubt Townhouse No. 24, Post Office Box 3504, Kenai, Alaska.

Wallace L. Haas, Jr., AIA and Stuart E. Greenfield, AIA have each formed their own architectural firm. Mr. Haas' new business name will be W. Haas Associates, located at 1930 Wilshire Boulevard, Suite 300, near Alvarado Street in Los Angeles. Mr. Greenfield will continue his practice under his own name at 1633 Westwood Boulevard, Los Angeles, California.

Jeffrey W. Kline, AIA announces the opening of his new office, for the practice of architecture, named Initia Incorporated, located at The Benedum Trees Building, Pittsburgh, Pennsylvania.

F. Guy Wilson, AIA and George L. Kennedy, AIA, PE have merged their professional practices and formed the Virginia offices of Wilson & Kennedy, located at 105 East Cary Street in Richmond.

Firm changes

Balzhiser, Longwood, Smith, Paul and Anderson Architects and Planners announce the appointment of Philip A. Giuntoli as an associate architect.

Raymond H. Conley has recently joined the firm of Calhoun, Tungate, Jackson & Dill as senior project architect.

Jess Wallerstein has been named an associate and Keith Ludowitz has been named a partner in the firm of Robert Herrick Carter & Associates.

Caudill Rowlett Scott, Inc. announced that Sizemore & Associates, Atlanta-based energy architects and planners, has joined CRS. The Atlanta office will be called Sizemore/CRS and will function as CRS' southeast regional office and will focus on energy-related activities.

Dames & Moore has named Howard A. Schirmer, Jr., regional manager of operations in the Pacific, Far East and Australia.

Louis C. Milani has joined Technical Management Services, Inc. and has been named manager of the construction management division. TMSI is a subsidiary of the architectural, engineering and consulting firm of Daniel, Mann, Johnson & Mendenhall.

Design Space International announces organizational changes: William Andrew Lindelow, Jr. has been appointed to director of major projects. Robert S. Bach has assumed the additional responsibility for division purchasing, and Stephen B. Zatuchni has joined DSI as the director of sales and training.

Gensler and Associates/Architects announce the following appointments in their San Francisco office. As directors: Donald W. Kennedy, AIA and Rodger N. Voorhees, associate AIA; vice presidents: Charles C. Kridler, AIA and Steve L. Wintner, AIA; senior associates: Derek L. Claudius, Linda Moriarty Groth, Gordon T. Johnson, AIA, Kathleen M. Parker and Terry R. Stephens; associates: Gary T. Fitschen and James A. Kautz.

Jack S. Friedman, AIA has been appointed to vice president and chief architect of O. Germany, Inc.

Ruddell Reed III has been named vice president of marketing for HTB Inc. He will be responsible for coordinating HTB's new business activities.

Albert P. Martin, AIA has been named president of Hughes ArchiSystems International, Inc.

Hunt and Company, Architects announce that Gordon Dey has become a certified construction specifier in the new voluntary program offered by the Construction Specifications Institute. Harold D. Crosby, Jr. has recently joined the staff of Hunt and Company as a senior architect.

The architectural firm of Rees Associates, Inc. has added six new members to its staff. The new personnel are: C. Stewart Sorey, Steve G. Bures, and William D. Howell, Jr., architects; Lisa Janesic, draftsperson; Carol H. Howells, accounting systems specialist; and Danellyn J. Shannon, administrative assistant.

Straub, Van Dine, Dziurman/Architects announce that Dennis King, AIA and Glenn Shuder, AIA have become associates in the Troy, Michigan firm. In addition, Mr. King has been named manager of design development and Mr. Shuder has been named manager of production.

Jacquelyn Hall, urban planner, Carmen Garufo and Michael Lardner, have been named associates in the architecture/planning firm of Wallace, Floyd, Ellenzweig, Moore, Inc.

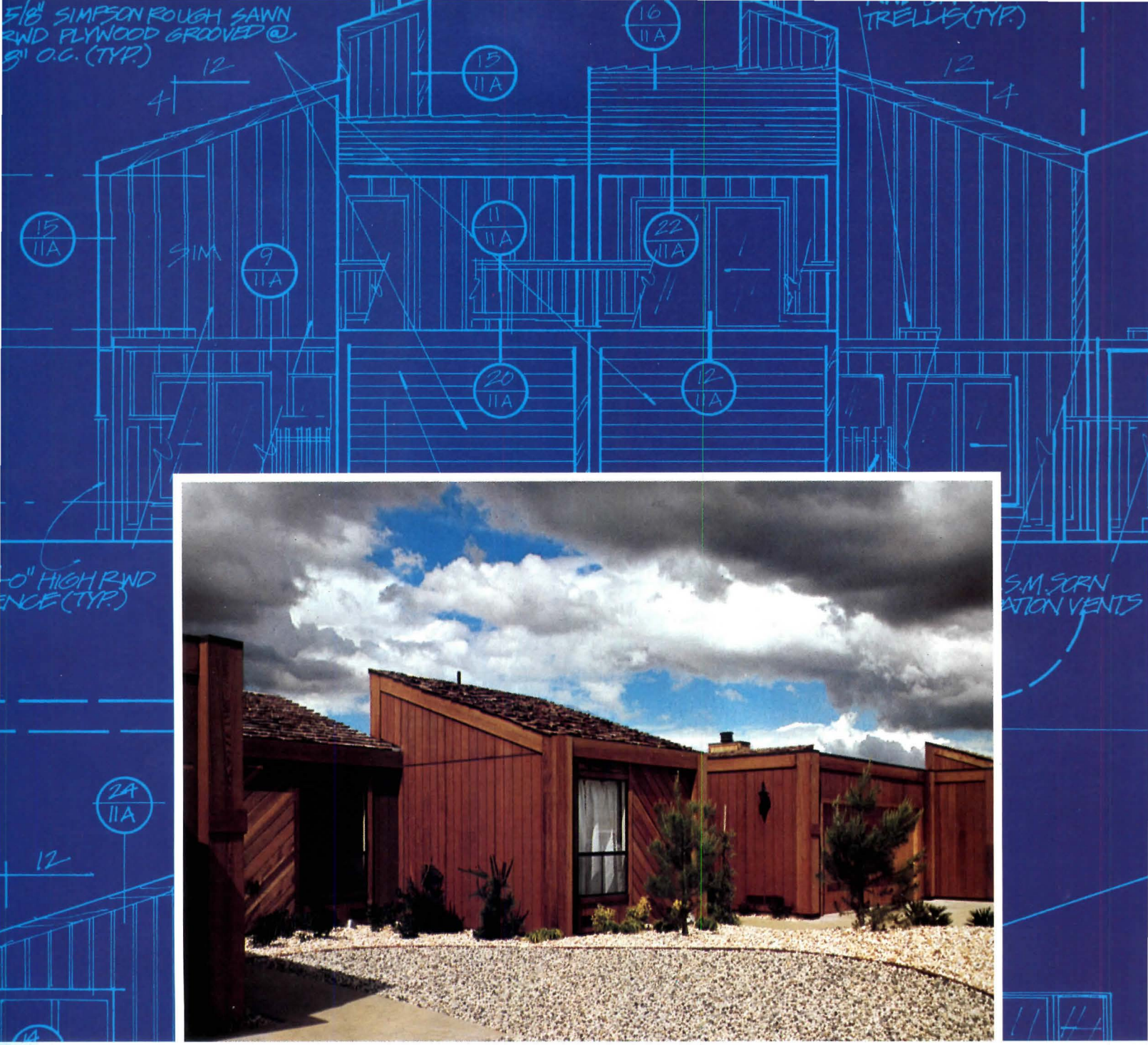
New addresses

The Clark Enersen Partners have moved to 600 NBC Center, Lincoln, Nebraska.

Jova/Daniels/Busby Incorporated has moved to 909 West Peachtree Street, Atlanta, Georgia.

Schwab & Twitty Architects, Inc. have moved to 340 Royal Palm Way, Palm Beach, Florida.

Van Ginkel Associates and Van Ginkel Partners have moved their offices from Montreal to Toronto. The new address is 34 Summerhill Gardens, Toronto, Ontario.



Architect: Albert R. Seyranian, A.I.A., Architect & Associates.

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Not only in design. But in the materials you choose to make them a reality.

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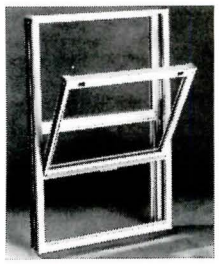

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FIBERGLASS TUB / An oval design with a fully skirted front, the "Merida" molded fiberglass bathtub is 60-in. long, 43-in.-wide, and 15-in. high. The tub is part of a full line of fiberglass tubs, shower receptors and other bath products, all offered in most standard fixture colors. The "Merida" carries a three-year product warranty. ▪ Florestone Products Co., Union City, CA.

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GLASS FILLER WATER STATION / The "1100 Series" glass filler is designed for fast countertop installation and easy under-counter plumbing connections. A non-splash aerator and a deep drain pan eliminates splashing. Over-all dimensions of the stainless steel sink are 8½- by 10-in., including a mounting flange. The 9-in.-high pedestal faucet provides water volume control; the chrome-plated grill covering the 2½-in.-deep sink holds six to eight water glasses while they are being filled. ▪ Fisher Mfg. Co., Los Angeles, CA

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BUILT - UP ROOFING / Specifically designed for reroofing application, the *BURmastic* cold process built-up system consists of three plies of double-coated roofing felts sandwiched between spray, brush or squeegee-applied layers of fast-setting *BURmastic* asphaltic adhesive. With high adhesive strength, the *BURmastic* roof can be applied over any structurally sound deck or rigid insulation, with no slope limitations, provided the roof is adequately graded to drainage outlets. The final surface can be finished off with an asphalt emulsion or reflective coating, or the *BURmastic* adhesive in combination with aggregate or ceramic granules. ▪ Tremco, Cleveland, Ohio.

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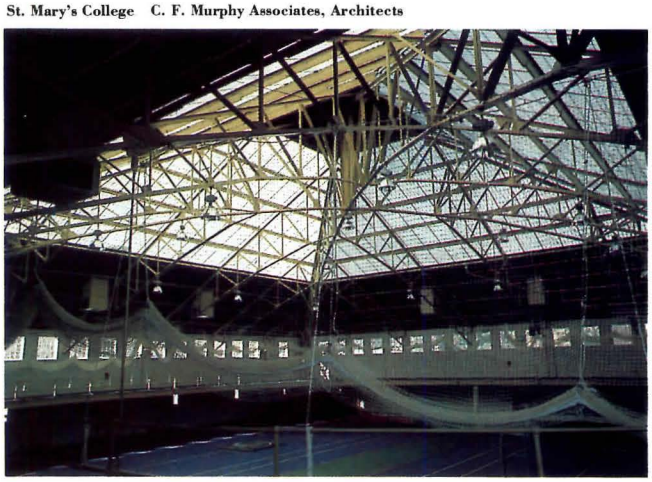
more products on page 165

THE WALL
THE ROOF
THE TOTAL ENVELOPE

St. Mary's College C. F. Murphy Associates, Architects



Phillips Andover Academy Johnson Hotvedt DiNisco & Associates, Inc., Architects

KALWALL

Jackie Robinson Middle School Stull Associates, Architects

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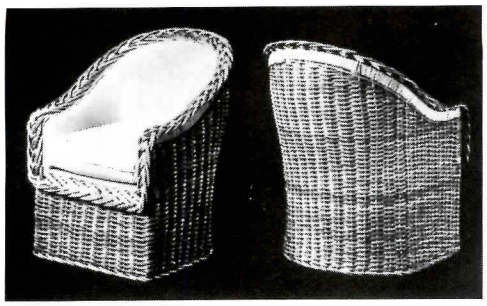

WICKER FURNITURE / Using imported wicker, but manufactured completely in the U.S., the "Newporter" collection of contract and residential furniture is handwoven on hardwood frames to prevent warping. On a smaller scale than other wicker pieces, the club and dining chairs shown here are 26- in. wide by 28-in.-deep, and either 36- or 38-in. high. Upholstery fabric is water repellent cotton canvas available in seven colors. ▪ Decorators Walk, Plainview, NY

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CUMULATIVE DEMAND REGISTERS / Automatic resetting of the demand dials is a new feature of "MCD-7" line of cumulative, mechanical demand registers. By simply depressing a lever, the demand motor resets the register completely, avoiding inadvertent partial resetting. Units are designed for use with the "J4" singlephase and "S" polyphase watthour meters. ▪ Sangamo Energy Management Div., Atlanta, GA

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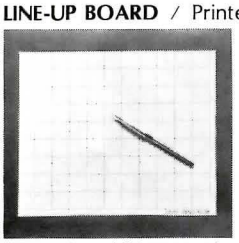
LINE-UP BOARD / Printed on 300 lb. plate Bristol stock with non-photographic grid, this pica grid line-up board allows the preparation of layouts and pasteups without pre-measuring. Boards are available in two sizes: 22- by 28- and 11- by 14-ins. In addition to pica divisions, boards gridded in 8th- and 10th-of an inch, millimeter and 2 mm increments are also offered. Smaller boards are 12 for $6.00; larger size is $1.60 each. ▪ C-Thru Graphics, Bloomfield, Conn.



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BULLET-RESISTANT GLASS / Laminated glass is used as glazing for visitor screens in a detention center, creating an open yet highly secure environment. The specially-hardened wire glass has a high-impact interlayer; the 34 mm-thick panes are bullet-resistant, and cannot be broken by attacks from blunt or sharp objects such as bricks and iron pipes. ▪ Laminated Glass Corp., Haverford, PA

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more products on page 167

Every building design consists of two parts: concept and compromise.

You build the ideal structure in your imagination, and then you begin accommodating that ideal to the real world. A world in which new imperatives, new practicalities, are constantly shrinking your design horizons. But it doesn't have to be that way. One building material, more than any other, can meet your aesthetic standards as well as the demands of the real world. Brick. Brick is uncompromising.

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Fine Arts Building, Wake Forest University, Winston-Salem, N.C. Caudill Rowlett Scott, Architects.

A Design This Bold Needs Brick, Not Compromise

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SECURITY X-RAY / Said to be an efficient, easy-to-use means of examining hand-carried articles such as women's purses, brief cases, and attache cases, the *Dynafluor X* security x-ray unit is shown here installed adjacent to a courtroom entrance in order to intercept dangerous items such as weapons, bombs or incendiary material. ▪ Philips Electronic Instruments, Inc., Mahway, NJ

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LARGE DOCUMENT FILE / Fire- and water-resistant "Mini-Planfile" units house 1200 24- by 36-, 30- by 42-, or 36- by 48-in. sheets in 4½-sq ft of floor space. A vertical folder/compression system maintains the contents perfectly flat and smooth while providing convenient, same-height access to every sheet. Standard features include pin tumbler key lock, and casters for mobility. ▪ Ulrich Planfiling Equipment Corp., Lakewood, NY

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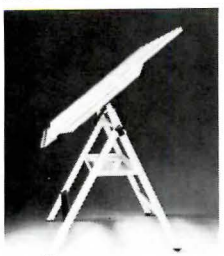
DRAFTING TABLE / The "Professional" art table has a warp-free laminate surface over a honeycomb core; the off-white finish minimizes glare. A half-turn of the handle locks and unlocks the brake mechanism, allowing unslippable drawing board positions from flat to vertical. Operating the wing knobs raises or lowers the top height to any level from 32- to 46-in; the desired height is held by pressure plates on the foldable legs. The "Professional" drafting table is offered in three top sizes: 24- by 36-, 31- by 42-, and 36- by 48-in., and seven colors. ▪ Plan Hold Corp., Irvine, Calif.



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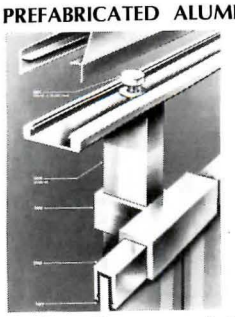
PREFABRICATED ALUMINUM RAILING / *Secural* is an anodized aluminum railing system that includes both baluster and panel types, suggested for a variety of applications. The corrosion-resistant surface is said to eliminate rusting, periodic painting and scraping, even in marine environments. A special feature of the railing system is its engineering, which cuts installation time to a minimum. Standard 24-ft lengths and balusters are pre-cut so that a worker can install the system with common tools. *Secural* systems meet OSHA and BOCA code requirements. Components, manufactured in France, are now available throughout the United States. ▪ Technal of America, Inc., Ashland, Va.



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Owens-Corning sound dividers. Designed so your design gets noticed. Not ours.

We don't expect people at work to appreciate the classic lines of our sound divider system.

They may not notice the handsome fabric covering. Or how beautifully the dividers fit together.

They may never see the electrical raceway hidden in the base or the shelf-hanging capability.

And they can't possibly know that their privacy comes from our special sound-absorbent Fiberglas* core inside each panel.

What they will notice is what really matters: the total landscape you've created.

For a free sound divider catalog, color selector, and booklet, "Speech Privacy in the Open Office," write T.B. Meeks, Owens-Corning Fiberglas Corporation, Fiberglas Tower, Toledo, Ohio 43659.

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Your editorial in the September ARCHITECTURAL RECORD entitled "Too Many Troubles in Too Many Buildings" is excellent. I found it to be well written and certainly timely.

I would like permission to have copies made. There are a number of clients that I would like to share this article with. It says clearly what I believe to be true.

Herbert W. von Colditz
Consulting Engineer
San Francisco

I was surprised and pleased to see your September editorial on "Too Many Troubles in Too Many Buildings." I believe that the problem is the absence of basic communication in the profession, and vulnerability in a competitive marketplace to this type of necessary discussion.

The reason I was surprised is that your magazine, probably one of the profession's best, is 65 per cent advertising and only 35 per cent content; of the 35 per cent, only a fraction is informational. To put it bluntly, this lack of information results in your being superficial. There could be a fact sheet on the square footage, cost, date of completion, mechanical systems, any construction problems encountered, etc. Instead we see beautiful pictures with meaningless captions. There is a lot of advertising, but no product evaluation. You have the opportunity to influence and educate thousands of architects, but instead you perpetuate the *Life* magazine approach to architecture.

We need a nonprofit testing service like consumer reports to test materials and products; we need monthly educational columns on construction techniques, as you have done on legal matters; we need a monthly problem column which can basically say "Hey, watch out for——," or "I had a problem with," so we could cut the page out and keep it for future reference.

Can you imagine a medical journal printing color photographs of an open incision with only a caption describing the beautiful stitches?

You do publish one issue per year of "Engineering for Architecture" which is more technical, and "Product Reports" (unfortunately no product evaluation.)

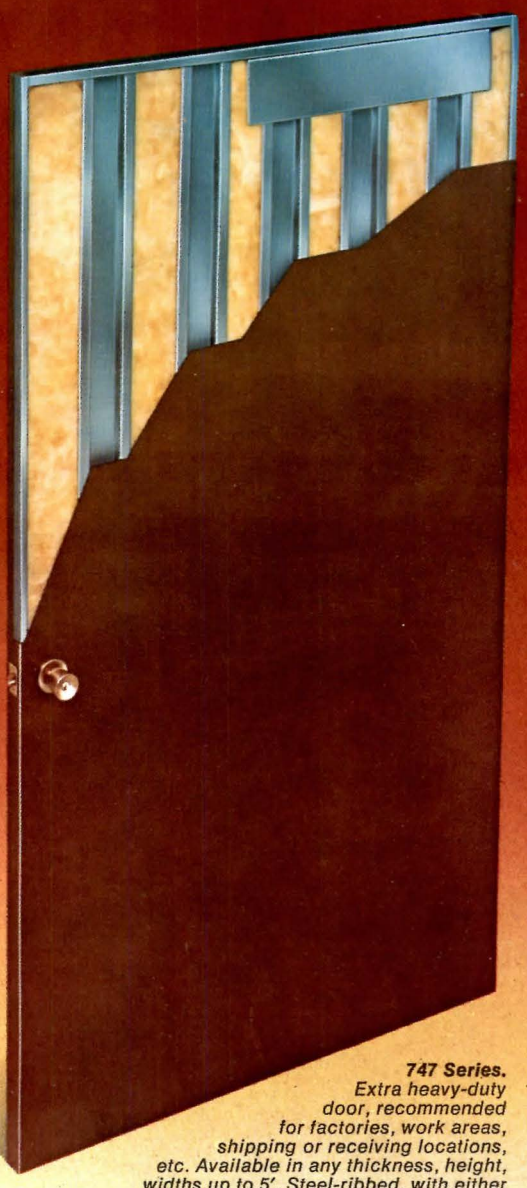
Architects are influenced by what you publish and sometimes "copy" the esthetics, not understanding the technical problems encountered or the sophisticated solutions necessary to make the esthetics possible.

Manufacturers' literature is misleading or incomplete and salesmen do not generally understand their products.

Many architectural magazines are no longer in print, and it is difficult to take a stand when that inevitability may be the result. But unless we "report our problems," we will continue to make the same mistakes, have pictures published of buildings with faulty detailing, products that are of poor quality, and interior finishes that only last until after the photograph is taken. The most unfortunate thing is that we will correct these problems on the next building, but the reader, assuming that since the building he sees was published because it represents "good and competent" architecture, will use similar detailing or specify similar products with similar unfortunate results.

David M. Berkowitz
Staff Architect
Massachusetts State
Building Code Commission
Boston

707 Series.
All-purpose steel door. Available in 2 thicknesses — 1⅜″ with 18- or 20-gauge face skins; and 1¾″ with 14-, 16-, 18- or 20-gauge face skins, all standard. Choose from face skins of cold rolled, galvanealed, stainless or embossed steel. Core is a solid slab of polystyrene, continuously bonded to skin. Wide choice of sizes, metals, louvers, lite arrangements, colors, fire protection and hardware preparations.



747 Series.
Extra heavy-duty door, recommended for factories, work areas, shipping or receiving locations, etc. Available in any thickness, height, widths up to 5′. Steel-ribbed, with either cold rolled or galvanealed 14-, 16- or 18-gauge face skins. Like 707 Series, utilizes U-shaped, hinged reinforcing channel and a continuous, beveled ⅛-inch in 2-inch lock edge channel.

Curries means more freedom of choice.

More freedom of choice means offering you more standard ways to close a doorspace than any other manufacturer of steel doors and frames.

More standard face widths: 1″, 1¼″, 1½″, 1¾″ and 2″.

More skin gauges (see above).

More flush and drywall frame depths: 3½″-12″, in ⅛″ increments.

In short, more ways to satisfy your needs without having to get into custom manufacturing.

Of course, when a project demands standard *and* custom sizes and configurations, Curries can supply you with both. And eliminate the delivery, service and hardware-coordination problems that arise when working with two suppliers who many times are from different parts of the country.

Standard, or custom-made. Either way, your local Curries distributor can help. Using his own inventory and fabricating capability to deliver quickly, inexpensively.

For more details, call him. (He's in the Yellow Pages.) Or see Sweet's 8.2/Cur.

Curries Manufacturing Inc., 251 9th St. SE, Mason City, Iowa 50401. (515) 423-1334.

CURRIES
THE METAL DOORMEN

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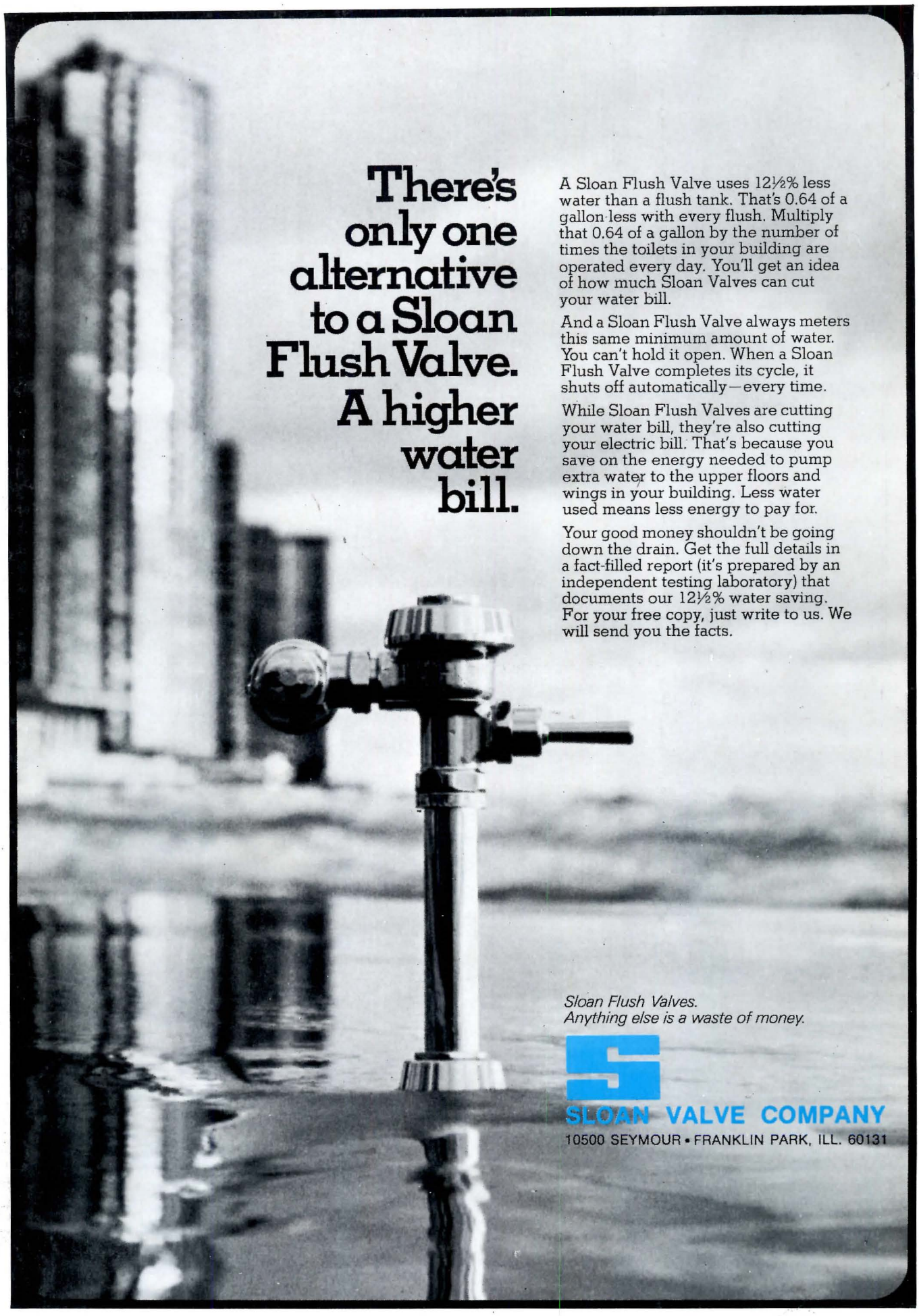

Circle 125 on inquiry card