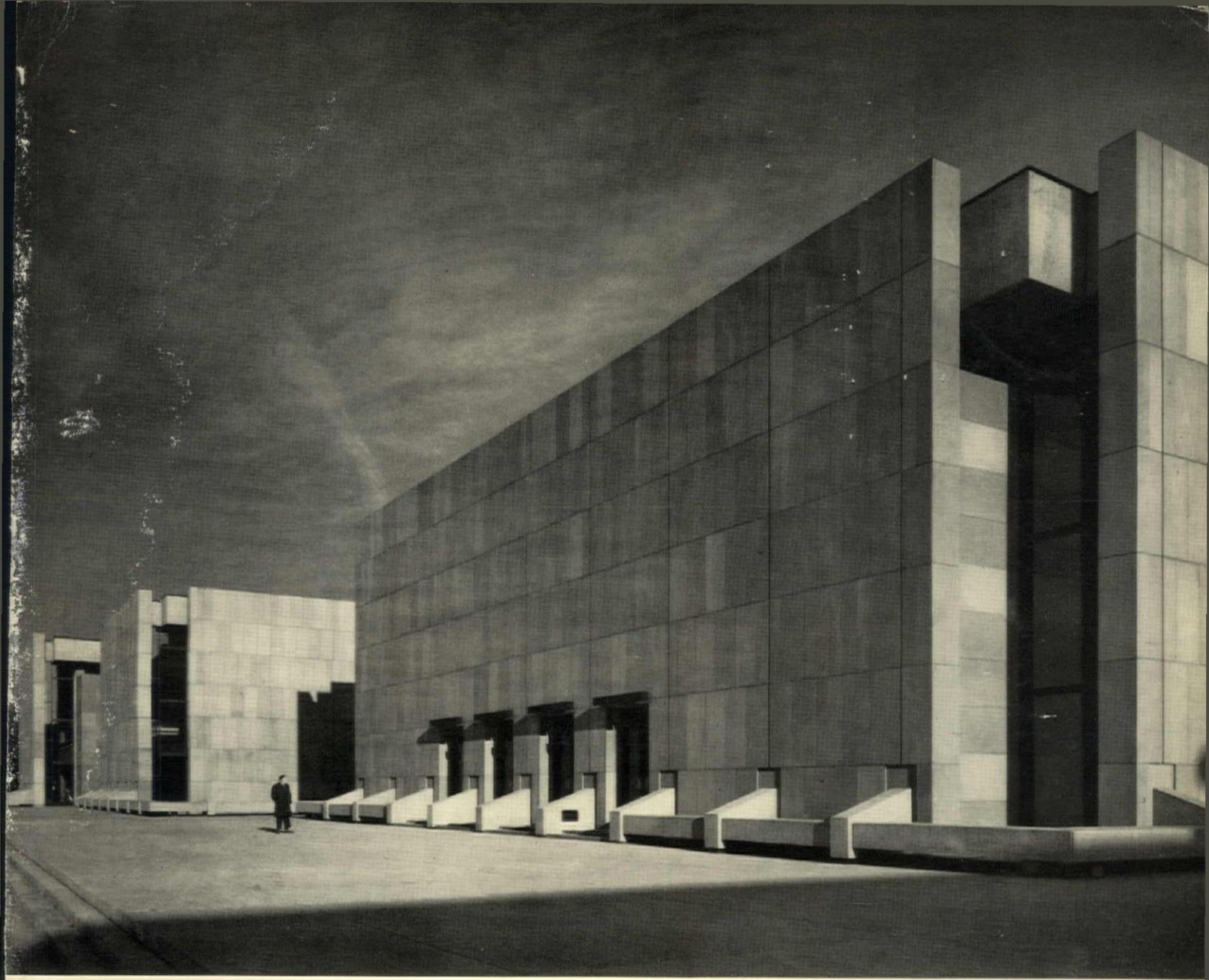


ARCHITECTURAL RECORD

4 APRIL 1965 · TWO DOLLARS PER COPY

BUILDING TYPES STUDY: APARTMENTS

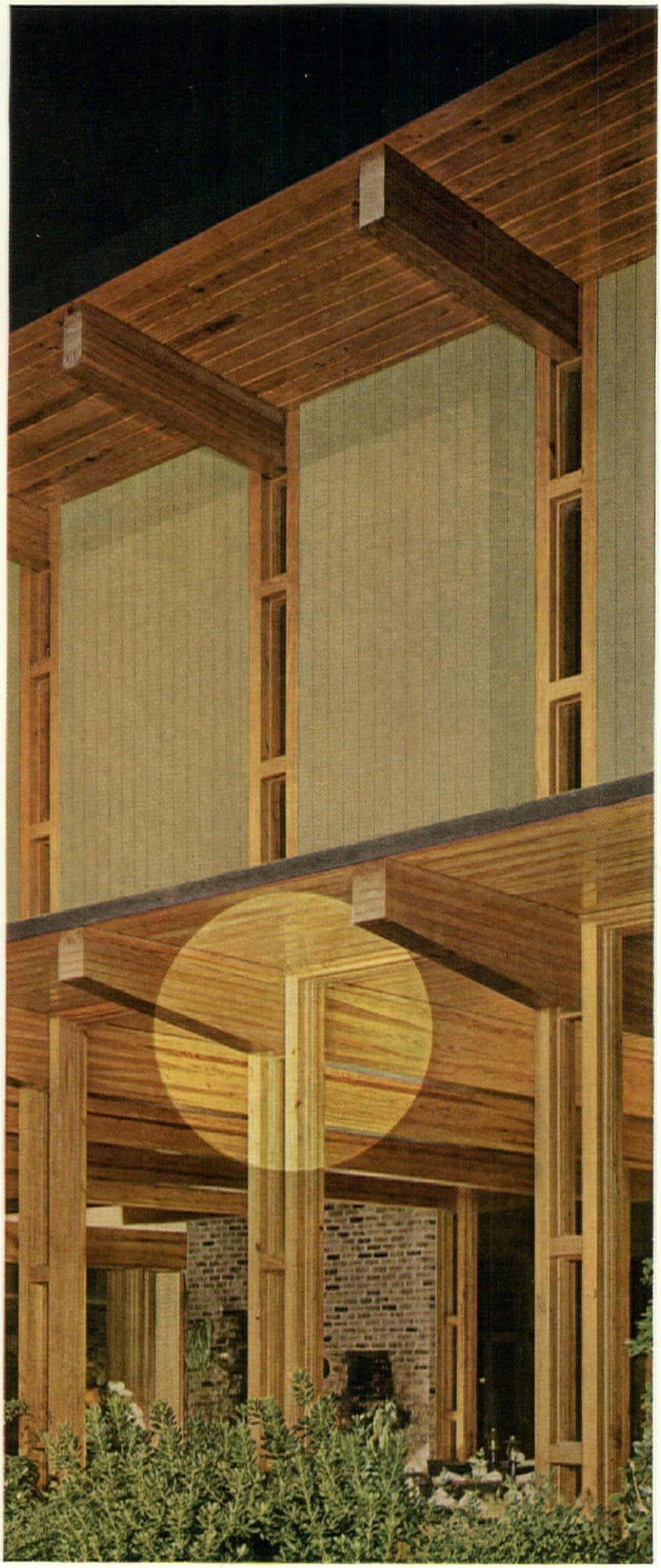
FINNISH TECHNICAL INSTITUTE BY ALVAR AALTO

CANADIAN CULTURE CENTER

A RESEARCH LABORATORY BY ULRICH FRANZEN

CHRISTOPHER ALEXANDER: "THE THEORY AND INVENTION OF FORM"

FULL CONTENTS ON PAGES 4 & 5



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Features

RECORD

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April 1965

Building Types Study 344: Apartments

Coming in the Record

A PROPOSAL FOR COLLABORATION AMONG THE VISUAL ARTS AND SCIENCES

In a forthcoming article Gyorgy Kepes, the noted painter and teacher develops a theory of synthesis in the arts and sciences which has become the rationale for a new program of instruction at the Massachusetts Institute of Technology School of Architecture and Planning. Illustrations will include examples of this synthesis of approach from Kepes' own work and that of his students.

BUILDING TYPES STUDY: STORES

As the programing of department stores becomes more and more complex to accommodate both the advancing technology of merchandising and, hopefully, an increasing emphasis on the esthetic aspects of design, any device that helps assure the architect that his attention to programing details is complete and in proper phase with the project should be welcome. Daniel Schwartzman offers such a device in a check list of programing items which will introduce the May Building Types Study. The portfolio of stores and shopping centers in this Study reflects current advances, technical and esthetic, in both exterior and interior design.

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Will there be a PLACE for Individuality?

My wife and I recently got ourselves ensnarled in a project which perhaps does some violence to logic. How many times I have advised friends not to buy the old barn or the little cottage and remodel it! But here I go. I didn't take my own advice any more than they did.

We bought it because it was the PLACE we wanted. We talked with a banker before we signed up; he said, "Yes, I know that place. That's the one that's so outrageously priced." And I said, "Yes, the price seems high. But some damn' fool might just come along and pay it, and that somebody might be me."

You see it's waterfront property, on a beautiful small-boat harbor, the best site—for us—that we ever found. But it's more than a site; it's a place we like. It's a promise of activities and interests and pleasant environment for future retirement years. And it has privacy and protection from those crowds that are going to jam every city and every resort area. We have been telling ourselves for a long time that we mustn't wait too long—those crowds were coming.

August Heckscher, of the Twentieth Century Fund, put our motivations in elegant language at a recent conference in Switzerland:

"The result of technological forces —combined with increased numbers of people, increased wealth, increased mobility and increased leisure—is to threaten the existence of every geographical place which is separate and distinct, every integrity which gives the individual the possibility of standing apart and meeting the world on his own terms. The man who can withstand the mass is a man who has his own place. He may not be isolated; he need not be a hermit. But he must have a sense that he is surrounded by space to move in, time to think in—an environment which is congenial and in some sense an enlargement of his own being. If this space is eaten away, he is himself diminished. If it disappears into a homogeneous and undividualized nothingness, then the individual has in effect become part of the mass. . . ."

Heckscher goes on to point out that this sense of *place* is really the basis of our insistence on property rights. But that (oversimplified extraction) "what the individual requires is not a plot of ground but *a place*—a context within which he can expand and become himself."

My wife and I have stuck to a rather literal interpretation of this concept of "context within which, etc." To each of us this means an individual place—a private space where each can retire to his or her own interest, be it of necessity just plain sitting. Maybe she will want to do an opus on the terrors of being a grandmother; maybe I'll start jabbing at an easel. Our own house, first, on that beautiful harbor; and, second, that individual corner for retreat or rumination.

An old fashioned idea? Perhaps. Retreat — privacy — individuality. How can we expect things like that when the population of the world is going to double? Well, I'm going to do what I can, while I can. My sense of *place* is quite strong, and it relates, as I said, to *space*. To me, space is the most precious resource an architect ever dealt with.

"Many of our ills," said Heckscher, "spring from overcrowding, from disregard of the natural limits and uses of the landscape, from obliteration of its distinguishing marks. The results are often direct and physical: the individual is in the exact sense hedged in and diminished . . . A scene of uniformity, without rhythms and variety of texture, is mirrored in souls given easily to boredom and a sense of pervading monotony.

"To give full weight to the insights of the planners; that is the first step—and a very important one—in reaffirming the place of the individual in our society."

And: "The degree to which the spirit of individuality is preserved is closely related to the degree to which we can shape and control the environment."

—*Emerson Goble*

DORMITORIES COMPLETE AT ST. OLAF COLLEGE

Women's dormitory (*above*) and men's dormitory (*below*)

Les Turnau, photos

Two high rise dormitories, one for women and one for men, have recently been completed on the campus of St. Olaf College, Northfield, Minnesota. Architects for the project are the firm of Sövik, Mathre & Madson.

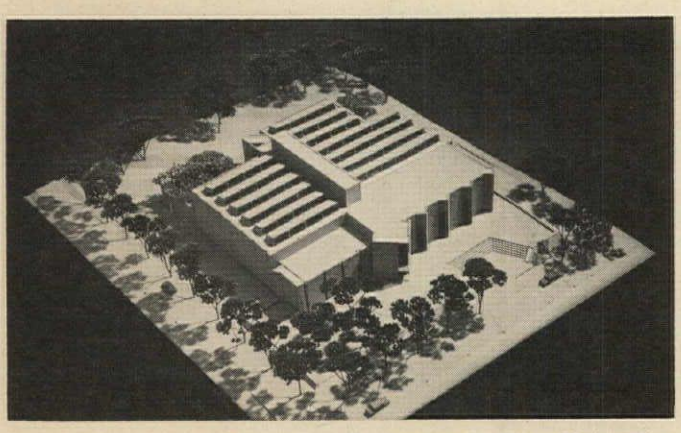
The architects chose to build high-rise rather than walk-up buildings at this small college with an enrollment of just over 2,000 students, because they felt that this was the most effective way to achieve living units of 30 students on each floor in the men's dormitory, and alternately 24 and 26 students per floor in the women's dormitory.

The men's dormitory is 10 stories and will accommodate 296 students, while the women's dormitory has 12 stories and houses 292. Because of the irregular configuration of the plans for each building, no two rooms are alike on any floor—the architect's wish being to allow individuality of arrangement. There are 15 different room shapes for men and 13 for the women.

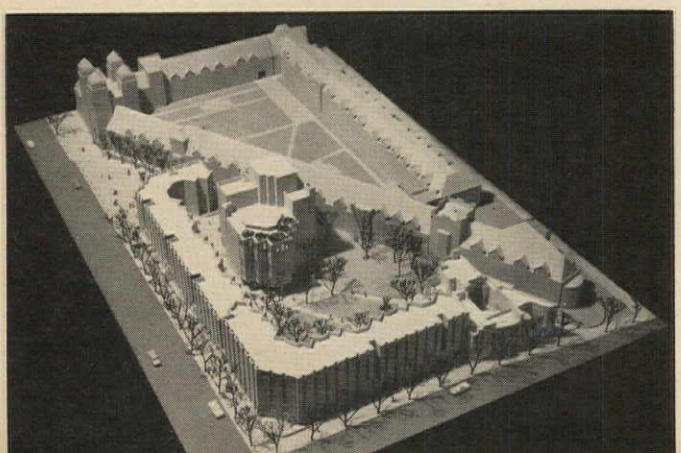
The buildings, which cost a total of $3,057,000, have concrete frames with concrete floor systems. Exterior walls are random ashlar lannon stone face, which relates to other buildings on the campus. Total cost per square foot is $19.

Structural engineers were Kolbjorm Saether & Associates; mechanical and electrical engineer was Lewis Freedland; general contractor was the Bor-Son Construction Company.

UNIVERSITY BUILDINGS IN PENNSYLVANIA



Physical Education Building at Pennsylvania State University (*above*) Dormitories at the University of Pennsylvania (*below*)



Lawrence S. Williams, Inc., photos

Shown at left are two projects by the Philadelphia architectural firm of Kneedler, Mirick & Zantzinger. The Physical Education Building for Pennsylvania State University provides facilities for an extensive intramural swimming program and intercollegiate swimming events. The building is conceived as a cluster of tall skylighted pavillions that create spaces for competition, instruction and diving pools. All column and beam elements are precast concrete; the grandstand, stair towers, pools and shafts are poured concrete. The free non-structural exterior wall is brick masonry.

The undergraduate men's dormitories and master's house proposed for the University of Pennsylvania, Philadelphia, are an extension of the existing dormitory complex and are designed to relate to the older structures. The dormitories consist of eight 4-story house units accommodating 32 students each. Also included are apartments for eight junior faculty members, offices for six senior faculty members and a residence and office for the master of the house. The buildings are faced with precast concrete mullions and brick.

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EIGHTEEN STRUCTURES HONORED IN CANADA'S MASSEY AWARDS

Eighteen silver medals were awarded to architects and architectural firms in Canada for the design of 18 structures in the Massey Medal Competition of 1964. The competition is administered by the Royal Architectural Institute of Canada and was instituted by the Massey Foundation in 1950. The 18 winners are shown on this and following pages.

The Massey competitions are intended to stimulate members of the Canadian architectural profession and to promote public interest. Previous award competitions have been held in 1950, 1952, 1955, 1958 and 1961.

In previous competitions, a gold medal was awarded in addition to the silver medals. In this competition, and in the future, the Massey Medals Committee and the Massey Foundation agreed that no gold medal should be awarded. They felt that it was inadvisable to select one at the expense of the others when the jury did not have a chance to investigate firsthand all of the entries.

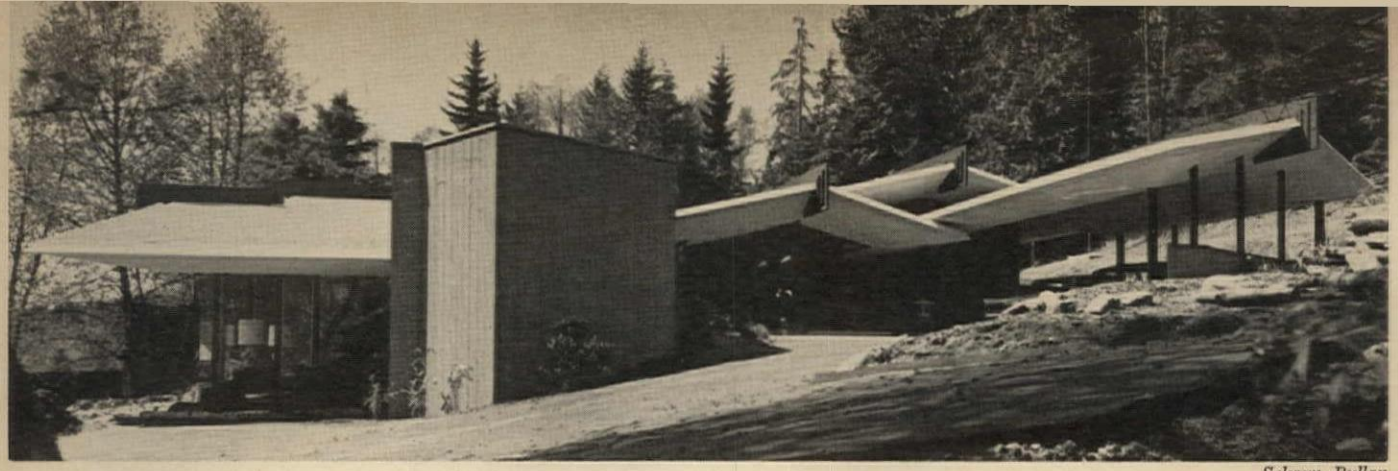
The competition was held in two

continued on page 330

C. J. Brown Memorial Pool, Burnaby, British Columbia
Architectural and Structural: McCarter, Nairne & Partners
Pool equipment: McCarter, Nairne & Partners
Heating and Consulting: D. W. Thomson & Company Ltd., Consulting Mechanical Engineers
Electrical: R. Lennox Mackenzie, Consulting Electrical Engineer
General Contractor: Biely Construction Company Ltd.
Owner: Corporation of the District of Burnaby

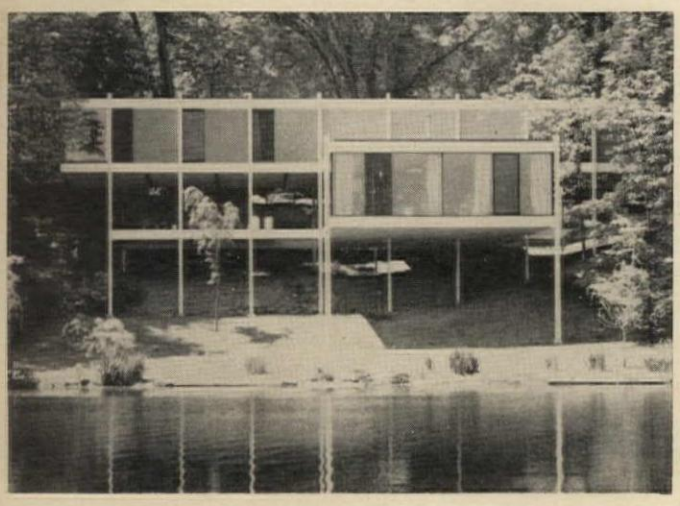
Neil Newton

Ontario Regional Headquarters, Imperial Oil Limited, Don Mills, Ontario
Architects & Engineers: John B. Parkin Associates
Owner: Imperial Oil Limited
General Contractor: Eastern Construction Company Limited



Selwyn Pullan

Forrest Residence, West Vancouver, British Columbia
Architects: Thompson, Berwick, Pratt & Partners
General Contractor: Fred Hagell



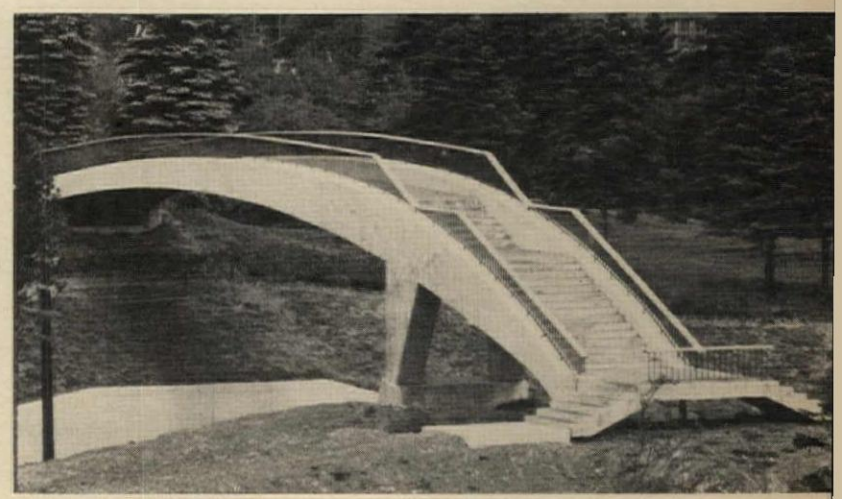
Residence, Rockcliffe, Ontario
Architect: Hart Massey
Engineers: Adjeleian, Goodkey, Weedmank and Associates
Owner: Mr. & Mrs. Hart Massey
General Contractor: Uniform Builders Ltd.

H. R. Jowett

Group Health Center, Sault Ste Marie, Ontario
Architect: Jerome Markson
Structural Engineer: M. S. Yolles & Associates
Mechanical and Electrical Engineers:
Ellard-Willson & Associates
Landscape Architect: Sasaki, Strong & Associates
General Contractors: Robertson-Yates Corporation Ltd.

Selwyn Pullan

Country Residence, Bowen Island, British Columbia
Architect: Ian J. Davidson
Structural Engineers: Read, Jones, Christoffersen
General Contractor: Ray-Bilt Contractors Ltd.



Footbridge in Bowring Park, St. John's, Newfoundland
Architect: Blanche van Ginkel
Designers: H. P. Daniel van Ginkel,
architect in charge, Ove Arup, engineer

Massey Awards

continued from page 13

H. R. Jowett

Lothian Mews, Toronto
Architects: Webb Zerafa Kenkes
Engineers: Reicher, Bradstock & Associates
Owner: Lothian House Ltd.
General Contractor: Robert McAlpine Ltd.

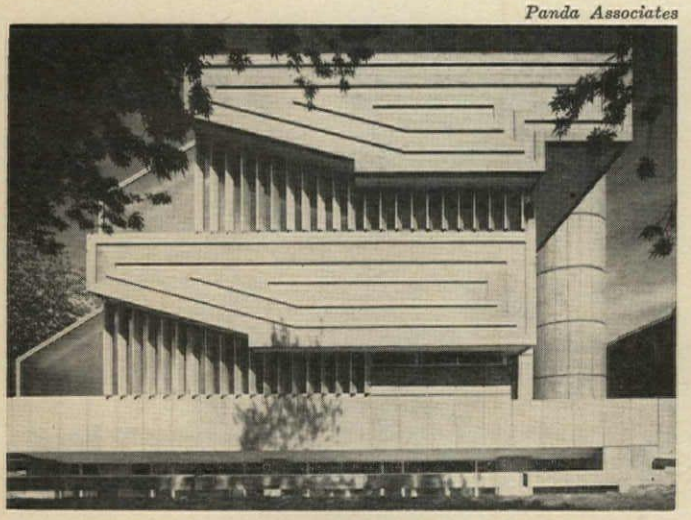
Panda Associates

Control Tower, Toronto International Airport, Malton, Ontario
Architects: John B. Parkin Associates, Toronto & Montreal
Owner: Department of Transport, Government of Canada
General Contractor: Louis Donolo (Ontario), Ltd.

Henry Kalen

St. Paul's College High School, Tuxedo, Manitoba
Architects: Libling Michener & Associates, Winnipeg, Man.
Structural Engineer: R. Lazar
Mechanical & Electrical Engineers:
T. B. J. Kruse & Associates
Landscape Architect: Denis R. Wilkinson
General Contractor: G. A. Baert Construction (1960) Ltd.

Panda Associates

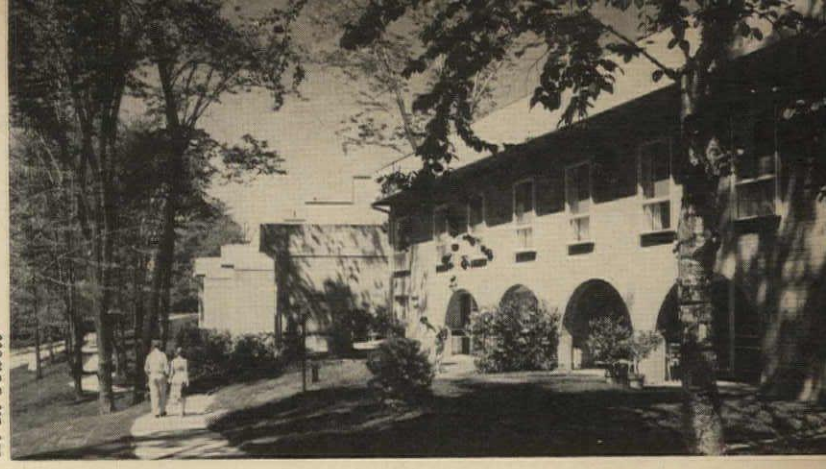


Central Technical School Art Center, Toronto, Ontario
Architects: Fairfield & DuBois
Structural Engineer: H. B. Tryhorn
Mechanical Engineer: R. T. Tamblyn & Partners Ltd.
Electrical Engineers: G. E. Mulvey & Company Ltd.
General Contractor: Bennett-Pratt Ltd.

Selwyn Pullan

John Grinnell Residence, West Vancouver, British Columbia
Architects: Thompson, Berwick, Pratt & Partners
General Contractor: E. Hjorth

Maltby Residence, West Vancouver, British Columbia
Architect: Fred Thornton Hollingsworth
Owner: E. B. Maltby
Contractor: J. G. Allan



H. R. Jowett

Don Valley Woods Phase I, North York, Ontario
Architects: Jack Klein and Henry Sears
Owner: Rubin Corporation
Landscape Architect: Sasaki-Strong and Associates
Mechanical & Electrical Engineer: J. Garay
Structural Engineer: N. Onen
Builder: Thornwell Construction

Han-sa

St. Gerard Majella Church & Presbytery, Saint Jean, Quebec
Architects: Affleck/ Desbarats/ Dimakopoulos/ Lebensold/ Sise
Structural Engineering Consultant: Bourgeois & Martineau
Mechanical & Electrical Engineering Consultants:
Laflamme, Lefrançois & Gauthier
General Contractor: Désourdy Frères

David G. Harris

Thomas J. Lipton Limited, Plant & Offices, Bramalea, Ontario
Architects & Engineers: John B. Parkin Associates, Toronto & Montreal
Owner: Thomas J. Lipton Limited
General Contractor: Redfern Construction Company Limited

Dik Nye

McGill University Laboratory and Dormitories, Mont St. Hilaire, Quebec
Architects: Lemoyne/ Edwards/ Shine/ and Charles Elliot Trudeau
Owner: McGill University
General Contractor: Chant Company Ltd.

Rayer Residence, West Vancouver, B.C.
Architects: Fred Thornton Hollingsworth, Barry Vance Downs
Owner: John Rayer
General Contractor:
Buchamer Construction Co.

Gil Amiaga

First Honor Award for Excellence in Civic Architecture and Urban Design: Warren Weaver Hall, Courant Institute of Mathmatical Sciences, New York University
Architect: Warner Burns Toan Lunde
Structural Engineer: Severud-Perrone-Fischer-Sturn-Conlin-Bandel
Mechanical Engineer: Meyer, Strong and Jones
General Contractor: Wigton-Abbott Corporation

First Honor Award for Excellence in Civic Architecture and Urban Design: Kips Bay Plaza, New York City
Architect: I. M. Pei & Associates
Associate Architect: S. J. Kessler & Sons
Landscape Architect: Leo A. Novick
General Contractor: ARI Construction Corporation

Award for Merit in Civic Architecture and Urban Design: Terminal Building at LaGuardia Airport
Architects: Harrison & Abramovitz
General Contractor: Turner Construction Company

Maris-Ezra Stoller Associates

Award for Merit in Landscape Architecture and Urban Design: Carver Houses Plaza, New York City
Architect: Pomerance & Breines
Landscape Architect: M. Paul Friedberg
General Contractor: Cuzzi Bros. & Singer

BARD AWARDS HONOR FIVE PROJECTS

Four buildings located in the five boroughs of New York City were honored in the third annual Bard Awards for excellence in civic architecture and urban design, sponsored by the City Club of New York Albert S. Bard Civic Award Trust Fund. In addition to the four award winners shown on this page, a citation for landmarks preservation was presented to the Marquesa de Cuevas for her role in the preservation of the buildings located at 680 and 684 Park Avenue, New York City.

The purpose of the program is "to encourage excellence in government-sponsored and government-aided architecture and urban design." Its name honors the late Albert S. Bard, former trustee of the City Club of New York. The Bard Award Trust Fund is joined in the sponsorship of the program by the J. M. Kaplan Fund, Inc., established by Jacob M. Kaplan, a member of the City Club, chairman of the board of the New School for Social Research, and a sponsor of its new center for New York City Affairs. Judges for the 1965 program were Marcel Breuer, F.A.I.A.; Olindo Grossi, F.A.I.A., dean of the School of Architecture at Pratt Institute; William J. Conklin, A.I.A.; Walter McQuade, A.I.A., architectural and design editor of Fortune magazine; and Sidney W. Dean, Jr., member of the Board of Trustees of the City Club.

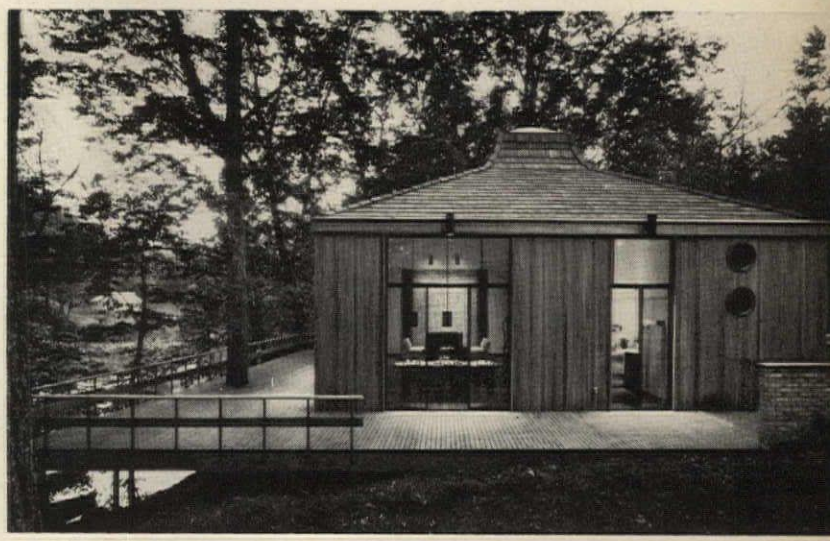
POTOMAC VALLEY A.I.A. PRESENTS AWARDS

Four "First Awards" shown on this page, and five "Awards of Merit" have been presented in the fifth Biennial Competition in Architecture of the Potomac Valley Chapter of Maryland of the American Institute of Architects. There were a total of 62 entries from 24 firms who are members of the Potomac Valley and Washington Metropolitan Chapters.

Receiving awards of merit were: Keyes, Lethbridge & Condon, architects for the Wheaton Youth Center, Wheaton, Maryland and for Carderock Springs, Potomac, Maryland; Faulkner, Kingsbury & Stenhouse, architects for the Holy Cross Hospital of Silver Spring, Silver Spring, Maryland; Cohen, Haft & Associates, architects, for Munson Hill Towers, Fairfax, Virginia; and Deigert & Yerkes & Associates, architects, for the National Arboretum Headquarters Building in Washington, D.C.

Serving on the jury were Charles Burchard, dean of the College of Architecture at Virginia Polytechnic Institute; Francis T. Taliaferro, a principal in the Maryland firm of Rogers, Taliaferro, Kostritsky and Lamb; and Karel Yasko, assistant commissioner for design and construction for the General Services Administration. Edwin Ball was awards chairman for the Potomac Valley chapter.

In the report of the jury, the residence for Mr. & Mrs. Allen Y. Naftalin, designed by Hugh Newell Jacobsen received the following comments: The jury found this to be the most consistent of all the designs submitted expressing a very personal and elegant approach. Though somewhat formal, it is softened by a romantic entry walk and off-center placement of the skylight. The jury was critical of the retaining wall detailing as being somewhat destructive to the form and questioned the appropriateness of the stair as viewed from the living room.



FIRST AWARD—BEST IN COMPETITION: Residence in Riva, Maryland
Architect: Hugh Newell Jacobsen, A.I.A.
Builder: Fishman Construction Company, Incorporated
Owner: Mr. & Mrs. Allen Y. Naftalin

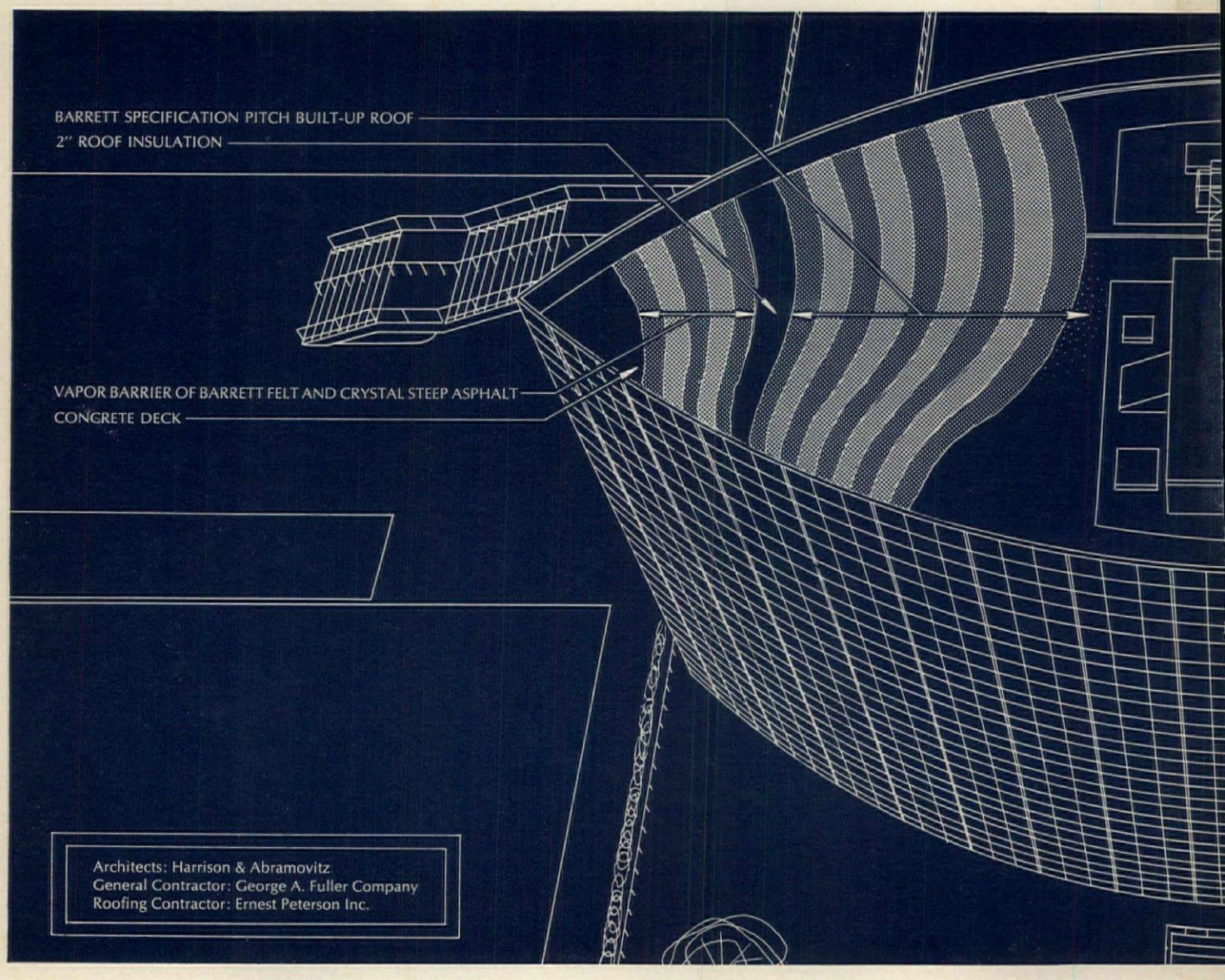
Robert Damora

FIRST AWARD: Headquarters Building
Architect: John Henry Sullivan, Jr., A.I.A.
Builder: Victor R. Beauchamp Associates, Incorporated
Owner: National Sand & Gravel Association;
National Ready Mixed Concrete Association

FIRST AWARD: 1717 Massachusetts Avenue, Washington, D.C.
Architect: Cooper & Auerbach, Architects
Builder: McCloskey & Company
Owner: Thomas D. McCloskey & Company

FIRST AWARD: Residence in Brookeville, Maryland
Architect: Harold Lionel Esten, A.I.A.
Builder: Sire Builders, Incorporated
Owner: Mr. & Mrs. John Landreth

Barrett...exciting new building materials from chemistry



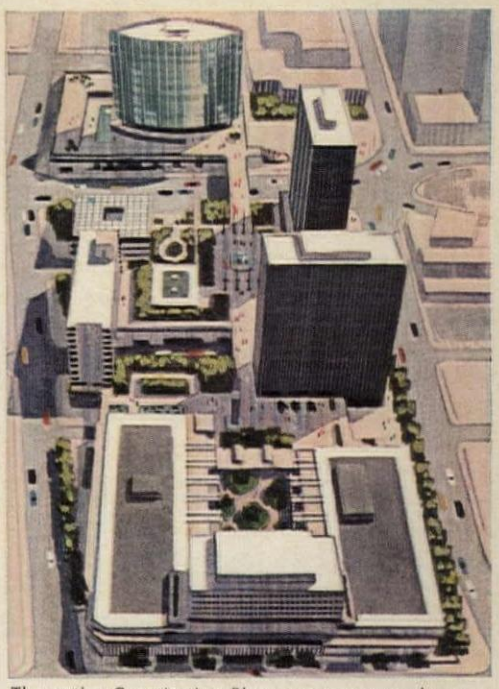
"Package" of Barrett products wraps up exciting design of new Phoenix Mutual Building

When Harrison & Abramovitz were designing this unusual building for Hartford's A.I.A. award-winning Constitution Plaza, they specified a Barrett built-up roof to assure lasting protection against New England's changeable climate.

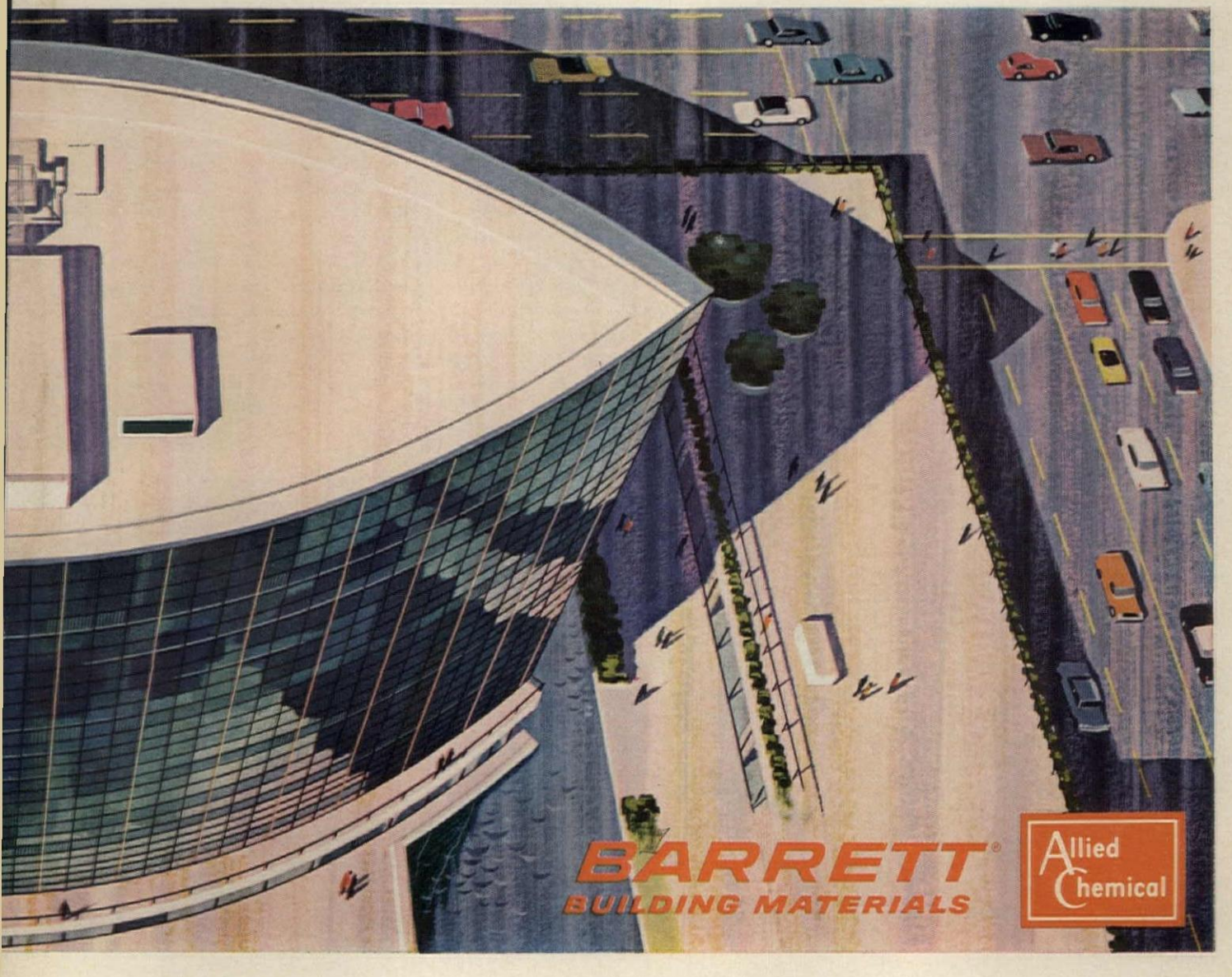
The unusual elliptical design of this building called for easy-to-handle, versatile interior partitions. Here Barrett Gypsum Wallboard was the choice because it provided the perfect material for durable, attractive walls that could easily be fabricated to unusual shapes.

The entire spacious promenade of Constitution Plaza employs Barrett Urethane Expansion Joint Filler which was specified to assure crack-free, resilient joints throughout the entire project.

What can a Barrett "package" of building materials do to improve your next building project? Plenty! Why not find out by calling our local representative or write Barrett Division, Allied Chemical Corporation, Department AR4, 40 Rector Street, New York, N.Y. 10006.



The entire Constitution Plaza was constructed over a modern 1800 car underground garage which is completely protected by Barrett waterproofing products.



For more data, circle 6 on Inquiry Card

PRESIDENT OUTLINES HOUSING AND ARTS SUBSIDY PROGRAMS, NAMES NATIONAL COUNCIL ON ARTS

In the past month, President Johnson delivered to congress his "Message on the Cities" which is the basis for the 1965 housing bill. In this message the President called for two significant new programs: rent supplements for middle income housing and a Department of Housing and Urban Development.

In another message, the President proposed a bill creating a National Foundation on the Arts and the Humanities. Through this foundation, groups or individuals would receive grants-in-aid from the government for creative endeavors.

The President also announced the 24 members of the National Council on the Arts. Included are architects Minoru Yamasaki and William Pereira. This council will become part of the National Foundation on the Arts and the Humanities.

Message on the Cities

In the "White House Message On The Cities" delivered to Congress by President Johnson on March 2, two new emphases seem to be emerging which will shape the federal government's approaches toward urban development and housing. First is a notable focus on the role of metropolitan and regional planning in dealing with urban problems. This emphasis is well exemplified by the President's recommendation "that every city of 50,000 or larger develop a Community Renewal Program as a condition of federal help for urban renewal."

Second is the equally important focus on the quality of the human environment as the national objective of the urban renewal and housing programs. As President Johnson said, "the problem is people and the quality of the lives they lead. We want to build not just housing units but neighborhoods; not just to construct schools, but to educate children; not just to raise income but to create beauty and end the poisoning of our environment."

To achieve these goals, the President outlined a program which calls for two notable new programs: the creation of a Department of Housing and Urban Development, first suggested by President Kennedy; and a program of rent supplements proposed to provide standard housing for lower middle income people stranded in the gap between low-rent public housing and the rents necessary for decent standard private housing.

The President's programs are incorporated in legislation designated as "The Housing and Urban Development Act of 1965." Of this bill, Housing Administrator Robert C. Weaver said: "It not only continues at high levels the basic housing and urban programs that have proved their worth, but it also undertakes to fill in the gaps in our housing needs, to provide new measures to promote sound, well planned growth of our urban areas, and to upgrade the opportunities of people as well as areas in our central cities." A separate bill, for the creation of a Department of Housing and Urban Development is expected to be submitted by the President later.

The rent supplement program would be limited to three categories of need: a program of rental and cooperative housing for low or moderate income families displaced by government actions or now living in substandard housing; a program of home ownership for those displaced or living in substandard housing who display a capacity for increasing income and eventually owning their own home; and a program to provide a broader range of housing for the low-income elderly.

Federal grants would make up the difference between the rents people could afford out of income—generally 20 percent of their income—and the economic rents necessary to support the operating costs and debt service of the housing. In the case of potential homebuyers, 25 percent of income would be paid by the lessees until their income rises to a level to enable the family to purchase the home under another F.H.A. program. As the income of such families or persons increases, the rent supplement would be reduced, until eventually the supplement would be eliminated entirely. The bill would authorize maximum annual rent supplement payments of $50 million beginning on July 1, 1965. This maximum would be increased by $50 million yearly until it reaches $200 million. The Department of Housing and Urban Development would consist of all of the present programs of the Housing and Home Finance Agency, and will also be primarily responsible for federal participation in metropolitan area thinking and planning. The agency would have regional representatives to offer assistance when it is requested, and to help coordinate projects among adjacent communities, sometimes through economic incentives. Also a part of the department would be an Institute of Urban Development to plan for the growth and development of an entire metropolitan area.

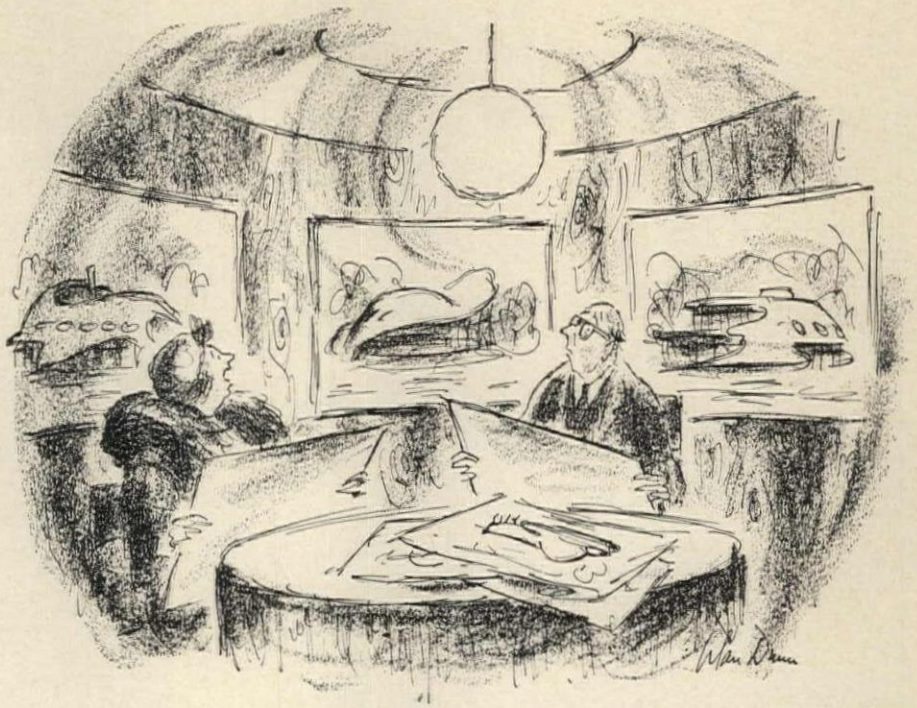
Another part of the President's message stresses the increased use of rehabilitation in housing. Specifically the President recommends a change in the public housing formula so that public housing funds can be more readily used to acquire and rehabilitate existing dwellings. Also recommended is the use of urban renewal funds to permit low-income homeowners to repair their own homes and non-profit sponsors to rehabilitate and operate homes for low-income families at rents they can afford. A program for the appropriation of funds for low-interest rehabilitation loans under urban renewal to help rescue existing housing from blight and decay was also recommended.

In existing programs the new housing bill authorizes 240,000 units of low-rent housing over the next four years, 140,000 units through new construction and 60,000 units from the existing supply to be purchased or rehabilitated, and 40,000 to be leased for use by low-income families.

Also called for is continued support for the college housing program, and a recommendation that the urban renewal program be increased to a level of $750 million a year by 1968.

In implementing his "Message on Natural Beauty" as applied to the city, the President called for a broadening of the open space program to help local governments acquire and clear areas to create small parks and

continued on page 346



Drawn for the RECORD *by Alan Dunn*

"But how would 'the new topology' look in Bronxville?"

A.I.A. DETAILS PLANS FOR 97th CONVENTION

The 97th annual convention of the American Institute of Architects, which will be held concurrently with the XI Pan American Congress of Architects from June 14-18 in Washington, D.C., will have as its theme "Cities of the New World." The A.I.A. will be host to the Pan American Congress, which will be attended by about 1,000 architects from 10 Latin American countries. The A.I.A. expects more than 2,000 of its members to attend.

Lewis Mumford, delivering the first annual Purves Memorial Lecture at a luncheon on Friday, June 18, heads a distinguished roster of speakers on the A.I.A, program. Investiture of Fellows will take place at the annual banquet the same evening. No Gold Medal will be awarded this year.

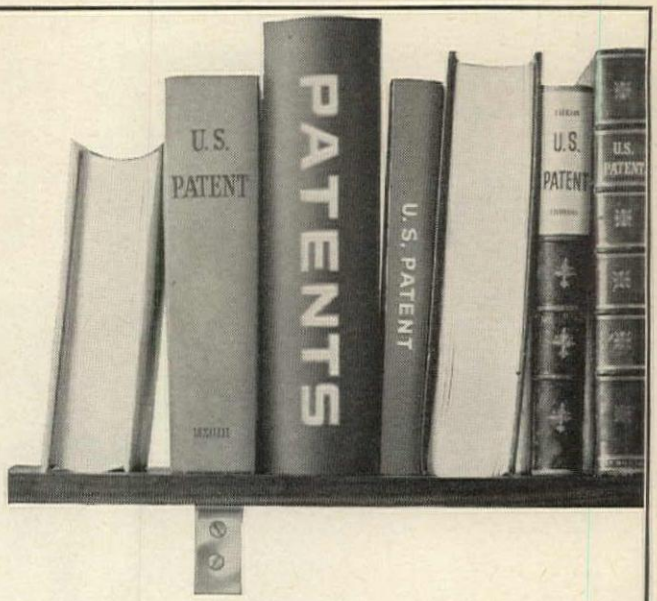
The program will include two technical seminars, one on housing, commerce and industry and one on health, education and recreation, both to be moderated by Daniel A. Schwartzman, F.A.I.A., of New York; and two "theme" seminars; the first, on "The Development and Present Condition of the Cities of the New World," to be moderated by Jose Luis Sert, A.I.A., dean of the Harvard Graduate School of Design; the second, on "The Future Prospects of Urbanization in the New World," to be moderated by Carl Feiss, F.A.I.A., Washington, D.C.

Technical seminar speakers include Carlos Raul Villanueva, Hon. F.A.I.A., Caracas, Venezuela; A. Quincy Jones, F.A.I.A., Los Angeles, California; Jorge Ferrari, Buenos Aires, Argentina; Minoru Yamasaki, F.A.I.A., Birmingham, Michigan; Felix Candela, Hon. F.A.I.A., Mexico City, Maximilian O. Urbahn, New York. Gabriel Serrano Camargo, Bogota, Columbia; Edward Durrell Stone, F.A.I.A., New York City; Emilio Duhart, Hon. F.A.I.A., Santiago, Chile; Ernest Kump, F.A.I.A., Palo Alto, California; O'Neil Ford, F.A.-I.A., San Antonio, Texas; and Max Abramovitz, F.A.I.A., New York.

Theme seminar speakers will include George Kubler, Yale University art historian; Villaneuva; Paul F. Damaz, A.I.A., New York City; and Martin Meyerson, acting chancellor of the University of California. Hon. Stewart L. Udall, Secretary of the Interior; August Heckscher, New York City, director of the Twentieth Century Fund; Luis Ortiz De Zevallos, Lima, Peru; and William Pereira, F.A.I.A., Los Angeles, California.

Annual honors will be awarded as follows: Allied Professions Medal—Leonardo Zeevaert, structural engineer, of Mexico; Fine Arts Medal—Roberto Burle-Marx, landscape architect, of Brazil; Industrial Arts Medal—Eliot Noyes, F.A.I.A., of New Canaan, Conn.; Architectural Photography Medal—Robert Damora, A.I.A., of New York; Edward C. Kemper Award "for significant contributions to the Institute and the architectural profession"—Joseph Watterson, F.A.I.A., editor of the A.I.A. Journal; Citation of an Organization—the Architectural League of New York.

The annual Architectural Firm Award will go this year to the San Francisco firm, Wurster, Bernardi and Emmons, architects. Six men have been awarded honorary memberships in the Institute: Melton Ferris, executive director of the California Council; James R. Peifer, executive director of the Pennsylvania Society of Architects; Frederick Gutheim, president of The Washington Center for Metropolitan Studies; Bruno Bearzi, art adviser and collaborator to the American Battle Monuments Commission; August Heckscher; and Dean John Ely Burchard of the Massachusetts Institute of Technology.



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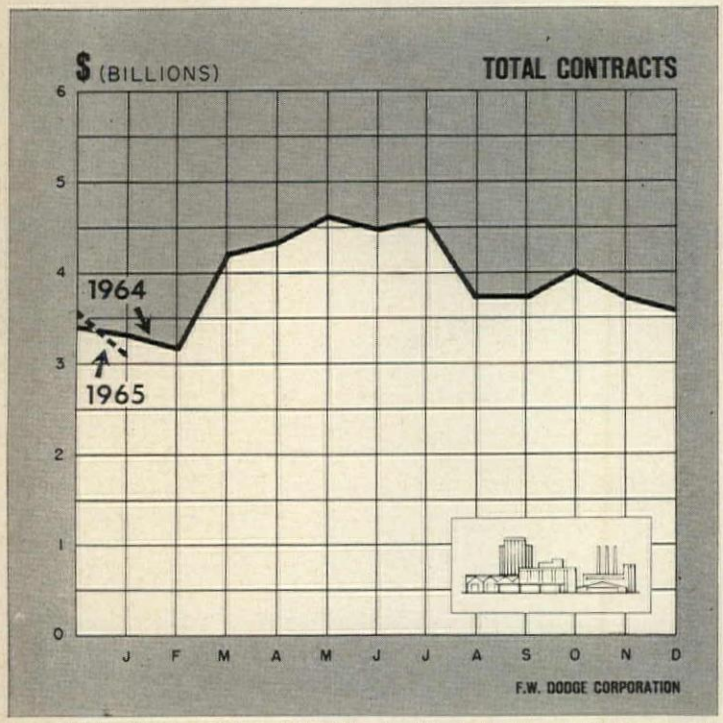
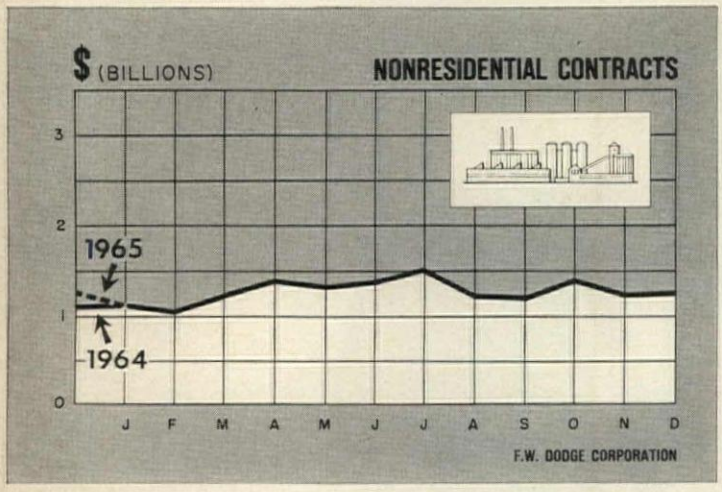
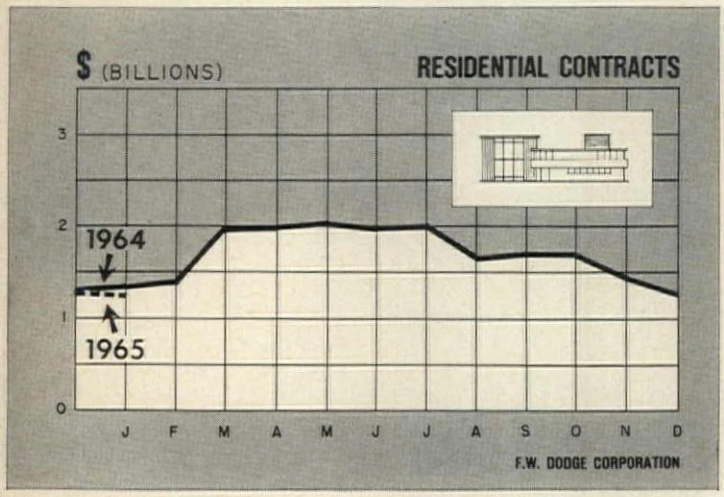


Total contracts include residential, nonresidential and non-building contracts





REGIONAL ROUNDUP

On a year-to-year basis, at least, the many diverse markets that are bound together under the common name of construction rarely—if ever—behave alike. And last year was certainly no exception to the rule. Contract value of *nonresidential* building types (commercial, industrial, and institutional structures) expanded twice as fast as the average of all construction; *nonbuilding* construction was ahead by just a bit better than the four per cent norm. *Residential* building value, on the other hand, showed no gain at all in 1964.

Geographically, the past year's total construction growth showed even more variation than it did according to building type. Measured against the same national four per cent gain, one region—the South East—was ahead by as much as 15 per cent, while another—the West—ran 6 per cent behind 1963's volume. In spite of these extremes, though, there were some recognizable patterns to the regional development of construction in 1964, and the table below helps to point them up.

Nonresidential building showed the clearest geographical trend last year. This category was heavily dominated by the extraordinary surge (+30 per cent) in contracts for manufacturing buildings and as a result, the strongest nonresidential gains were concentrated in the traditional industrial areas east of the Mississippi. New England, however, proved to be the exception to the rule.

PER CENT CHANGE IN CONSTRUCTION CONTRACT VALUE 1964/1963

REGION	Nonresidential Building	Residential Building	Nonbuilding Construction	Total Construction
New England	——	+19	— 6	+ 6
Mid Atlantic	+ 4	— 4	——	——
South East	+18	+ 9	+24	+15
Ohio Valley	+13	— 1	+16	+ 8
North Central	+10	+ 7	+12	+ 9
South Central	+11	+11	+ 4	+ 9
South West	+ 4	+ 2	+13	+ 5
West	+ 5	— 9	— 8	— 6
U.S. TOTAL	+ 8	——	+ 5	+ 4

F. W. Dodge Company, A Division of McGraw-Hill, Inc.

The regional distribution of residential building contracts was something else entirely. In contrast to a national total that remained almost exactly even with the previous year, four regions showed substantial (i.e. better than 5 per cent) gains, two registered significant losses, and two others were standoffs.

Just as manufacturing building dominated nonresidential totals in 1964, apartments were the key to the residential building last year. The two weak rental building areas in 1964 were the big ones—the Mid Atlantic and the West, and each was soft for its own reason. In the West, California was having trouble digesting the results of an unprecedented apartment boom covering the past few years. Early in 1964, as vacancies began to get burdensome, new rental building was cut back. Even so, 1964 came out a very big second-best. In the Mid Atlantic, where the New York met area looms large as an apartment market, the recent zoning law change has turned normal building trends topsy-turvy.

Meanwhile, throughout the South and in the Central states, where the apartment boom of the Sixties was a bit late in taking hold, residential building flourished during 1964.

George A. Christie, Chief Economist
F. W. Dodge Company
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Photo taken through a sample of Solarban Twindow simulating typical building location. Camera: 4 x 5 Graphic-View, 1/25 sec. at f18 with Ektachrome daylight.

COMPARATIVE PERFORMANCE DATA		U Value	Maximum Heat Gain (BTU/hr./ sq. ft.)	Visible Light Transmittance %
PLATE GLASS				
Regular Plate Glass	¼"	1.1	200	88
Solargray®	¼"	1.1	150	42
Solarbronze®	¼"	1.1	150	51
Solex®	¼"	1.1	150	73
SHEET GLASS				
Clear Sheet Glass	3/32"	1.1	205	90
Graylite™ 31	⅛"	1.1	170	31
Graylite 61	5/16"	1.1	195	61
Graylite 56	7/32"	1.1	190	56
Graylite 14	7/32"	1.1	150	14
Graylite 52	¼"	1.1	185	52
HIGH PERFORMANCE (Insulating, Heat and Glare Reducing)				
Clear Twindow®		.60	170	78
Solarban Twindow		.35	65	20
LHR Solargray Twindow		.60	90	22
LHR Solarbronze Twindow		.60	90	25
LHR Solex Twindow		.60	90	32
Solargray Twindow		.60	115	36
Solarbronze Twindow		.60	115	45
Solex Twindow		.60	115	65

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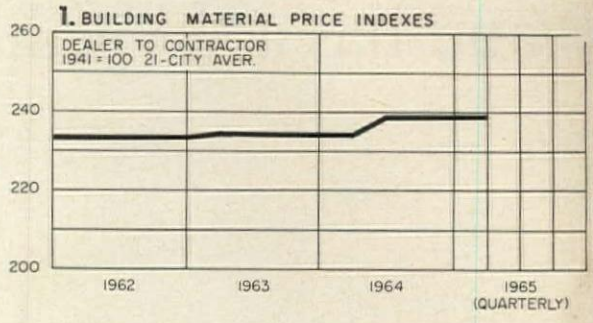
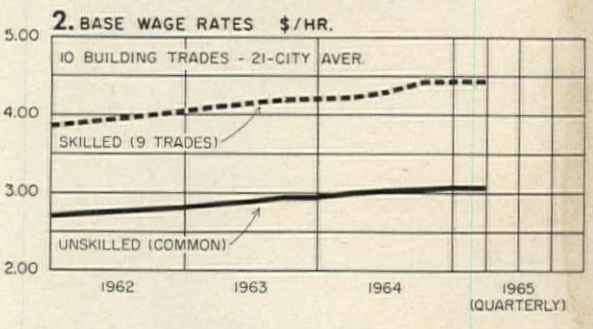
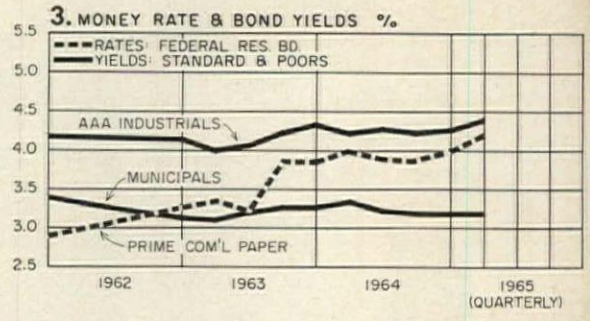
Building Construction Costs

By William H. Edgerton
Manager-Editor, Dow Building Cost Calculator, an F. W. Dodge service

The information presented here permits quick approximations of building construction costs in 21 leading cities and their suburban areas (within a 25-mile radius). The tables and charts can be used independently, or in combination as a system of complementary cost indicators. Information is included on past and present costs, and future cost can be projected by analysis of cost trends.







A. CURRENT BUILDING COST INDEXES—FEBRUARY 1965
1941 Averages for each city = 100.0

Metropolitan Area	Cost Differential	Current Dow Index Residential	Nonresidential	Per Cent Change Year Ago Res. & Nonres.
U.S. AVERAGE— 21 Cities	8.5	267.1	284.6	+1.35
Atlanta	7.1	302.9	321.3	+2.65
Baltimore	8.0	268.4	285.5	+0.71
Birmingham	7.4	248.4	267.1	+1.69
Boston	8.4	241.1	255.2	+1.98
Chicago	8.8	295.8	311.1	+0.72
Cincinnati	8.8	257.0	273.2	+0.97
Cleveland	9.3	269.6	286.5	+1.25
Dallas	7.8	251.4	259.7	+0.50
Denver	8.3	273.9	291.2	+0.73
Detroit	8.9	268.6	281.9	+1.23
Kansas City	8.3	240.6	254.7	+0.27
Los Angeles	8.4	270.1	295.5	+1.15
Miami	8.4	264.8	278.0	+0.80
Minneapolis	8.9	269.9	286.9	+1.86
New Orleans	7.9	241.6	255.9	+0.55
New York	10.0	279.1	300.2	+2.73
Philadelphia	8.7	265.6	278.8	+0.47
Pittsburgh	9.1	251.3	267.2	+1.14
St. Louis	8.9	263.6	279.3	+3.41
San Francisco	8.5	342.9	375.1	+2.91
Seattle	8.5	243.6	272.3	+0.60

B. HISTORICAL BUILDING COST INDEXES—AVERAGE OF ALL BUILDING TYPES, 21 CITIES — 1941 average for each city = 100

Metropolitan Area	1952	1958	1959	1960	1961	1962	1963	1964 (Quarterly) 1st	2nd	3rd	4th	1965 (Quarterly) 1st	2nd	3rd	4th
U.S. AVERAGE 21 Cities	213.5	248.9	255.0	259.2	264.6	266.8	273.4	274.7	276.8	278.6	279.3	279.5			
Atlanta	223.5	277.7	283.3	289.0	294.7	298.2	305.7	310.0	312.3	313.4	313.7	313.9			
Baltimore	213.3	251.9	264.5	272.6	269.9	271.8	275.5	277.2	279.3	280.5	280.6	280.5			
Birmingham	208.1	233.2	233.2	240.2	249.9	250.0	256.3	258.0	259.9	260.1	260.9	261.2			
Boston	199.0	230.5	230.5	232.8	237.5	239.8	244.1	246.1	247.9	251.3	252.1	251.7			
Chicago	231.2	273.2	278.6	284.2	289.9	292.0	301.0	302.2	304.5	305.1	306.6	306.5			
Cincinnati	207.7	250.0	250.0	255.0	257.6	258.8	263.9	265.1	267.1	268.9	269.5	269.4			
Cleveland	220.7	257.9	260.5	263.1	265.7	268.5	275.8	276.3	278.4	282.0	283.0	282.3			
Dallas	221.9	230.5	237.5	239.9	244.7	246.9	253.0	253.7	255.6	255.6	256.4	256.9			
Denver	211.8	252.8	257.9	257.9	270.9	274.9	282.5	282.6	284.7	287.3	287.3	287.3			
Detroit	197.8	239.8	249.4	259.5	264.7	265.9	272.2	272.7	274.7	277.7	277.7	277.7			
Kansas City	213.3	235.0	239.6	237.1	237.1	240.1	247.8	246.2	248.0	249.6	250.5	251.2			
Los Angeles	210.3	253.4	263.5	263.6	274.3	276.3	282.5	284.0	286.1	286.1	288.2	288.9			
Miami	199.4	239.3	249.0	256.5	259.1	260.3	269.3	270.1	272.1	273.1	274.4	274.4			
Minneapolis	213.5	249.9	254.9	260.0	267.9	269.0	275.3	275.0	277.1	281.6	282.4	283.4			
New Orleans	207.1	235.1	237.5	242.3	244.7	245.1	248.3	247.1	248.9	249.3	249.9	250.5			
New York	207.4	247.6	260.2	265.4	270.8	276.0	282.3	284.8	286.9	289.7	289.4	290.2			
Philadelphia	228.3	257.6	262.8	262.8	265.4	265.2	271.2	271.1	273.1	274.5	275.2	275.5			
Pittsburgh	204.0	236.4	241.1	243.5	250.9	251.8	258.2	260.8	262.7	262.9	263.8	264.0			
St. Louis	213.1	239.7	246.9	251.9	256.9	255.4	263.4	266.8	268.8	271.4	272.1	272.9			
San Francisco	266.4	308.6	321.1	327.5	337.4	343.3	352.4	358.2	360.9	364.1	365.4	366.6			
Seattle	191.8	225.8	232.7	237.4	247.0	252.5	260.6	260.1	262.0	265.7	266.6	265.1			

HOW TO USE TABLES AND CHARTS: Building costs may be directly compared to costs in the 1941 base year in tables A and B: an index of 256.3 for a given city for a certain period means that costs in that city for that period are 2.563 times 1941 costs, an increase of 156.3% over 1941 costs.

TABLE A. Differences in costs between two cities may be compared by dividing the cost differential figure of one city by that of a second; if the cost differential of one city (10.0) divided by that of a second (8.0) equals 125%, then costs in first city are 25% higher than costs in second. Also, costs in second city are 80% of those in first (8.0 ÷ 10.0 = 80%) or 20% lower in the second city

TABLE B. 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 index for a city for one period (200.0) divided by index for a second period (150.0) equals 133%, the costs in the one period are 33% higher than those of the other. Also, second period costs are 75% of those of the other date (150.0 ÷ 200.0 = 75%) or 25% lower in the second period. CHART 1. Building materials indexes reflect prices paid by builders for quantity purchases delivered at construction sites. CHART 2. The $1.20 per hour gap between skilled and unskilled labor has remained fairly constant. CHART 3. Barometric business indicators that reflect variations in the state of the money market

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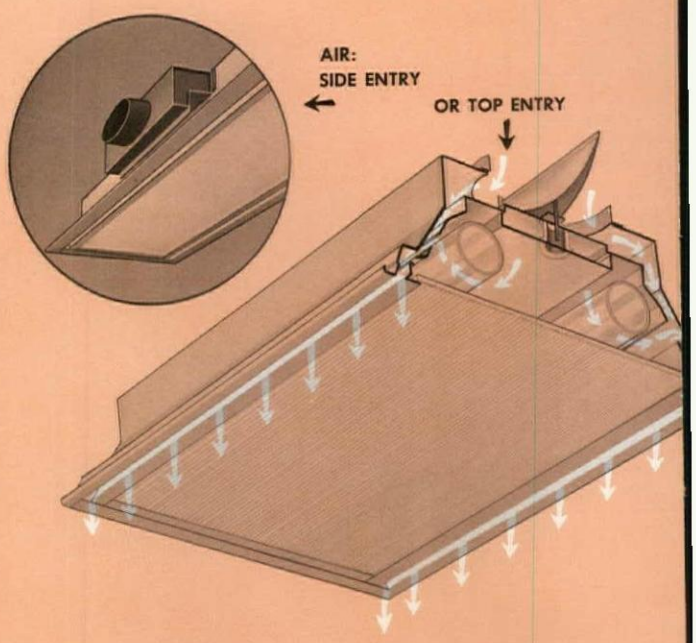

SYLVA-FLO II FEATURES:

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- **Luminous Slots**
- **Coalescent Air Stream**
- **Side or Top Valve**
- **Increased Light Output**
- **Automatic Heat Removal**

The heat from the lamp chamber is drawn into the supply or return air streams of the Sylva-Flo II units. This results in outstanding lighting performance by permitting the lamps to operate closer to their designed operating temperature.

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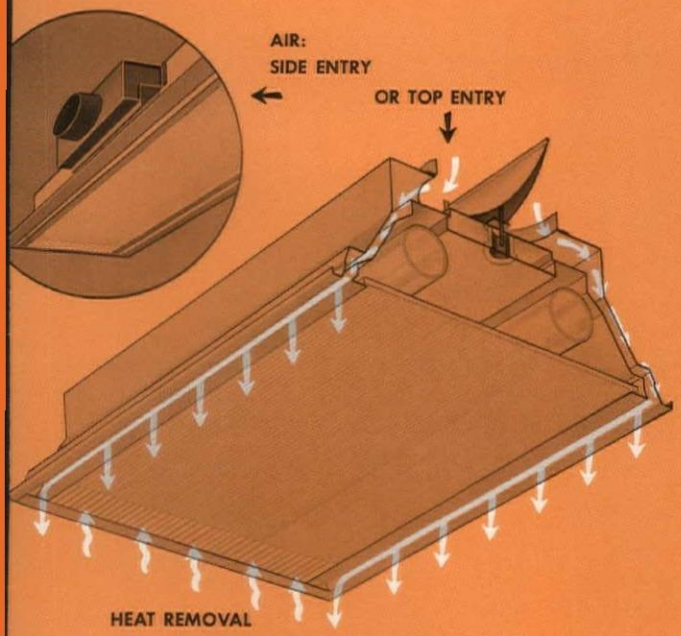
Complete height is only 5½" when side entry is used. With top entry, overall installed height is approximately 11".

Supply, Return and "Static" units available in 1' and 2' widths.

SYLVA-FLO III



SYLVA-FLO III FEATURES:

- **Fully Integrated Design**
- **Complete Height only 5½" with side entry**
- **Isolated Lamp Chamber**
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- **Side or Top Valve**
- **Heat Removal Feature (with Volume Control)**
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Similar to the Sylva-Flo II except that it provides complete separation of the air path from the lamp chamber.

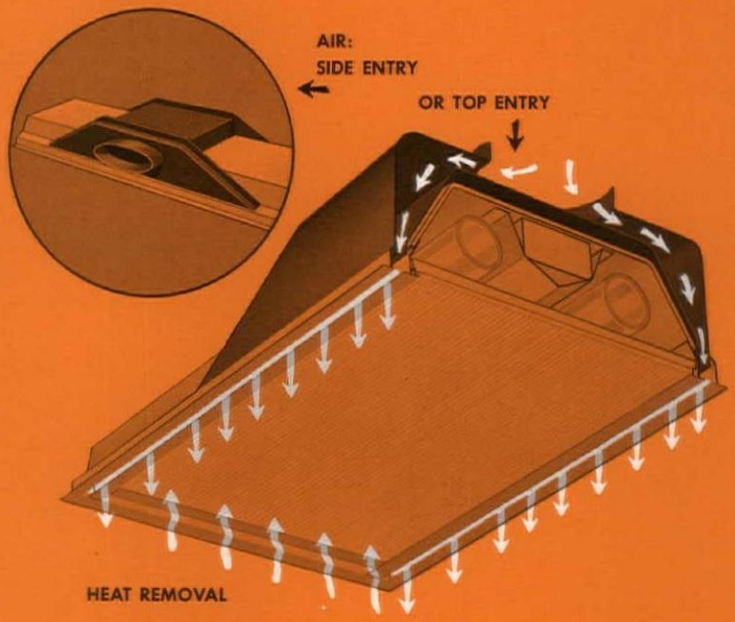
Also utilizes the low-velocity Pyle-National Multi-Vent Air Handling System.

A unique feature of the Sylva-Flo III is its ability to combine supply air and heat removal in a single unit. Supply air passes through slots along the side of the door frame and returned "used" air is removed through luminous air intakes at each end of the frame. The return air is drawn into the lamp chamber around the lamp and into the plenum via adjustable slots in the top of the troffer housing.

Sylva-Flo III units in both 1′ and 2′ widths can be used for a wide variety of air handling applications.

1. Supply Air Only
2. Supply with Heat Removal
3. Return Air Only
4. Heat Removal Only
5. Return and Heat Removal

TITAN



TITAN FEATURES:

- **Complete Fixture Assembly—only 6½" high with side entry**
- **Double Isolated Air Chamber**
- **High Capacity Air Delivery**
- **Side or Top Entry**
- **Built-in linear controller vanes for Volume and Direction Control**
- **Heat Removal Features (with Volume Control)**
- **Door Intakes—Luminous or Dirt Trap**
- **Frameless or Framed Shielding**

Combines Sylvania's shallow troffers with a specially designed air diffuser provided by Titus Manufacturing Corp.

The Titan Series features a large luminous area provided by frameless shielding (in addition to framed shielding), narrow trim and minimum metal surface.

The Titan's unique linear controller vanes (manufactured by Titus and factory installed by Sylvania) permit a 180° adjustable air pattern and complete flow rate control. The result is an amazingly versatile and easily adjustable air control device.

Sylvania provides

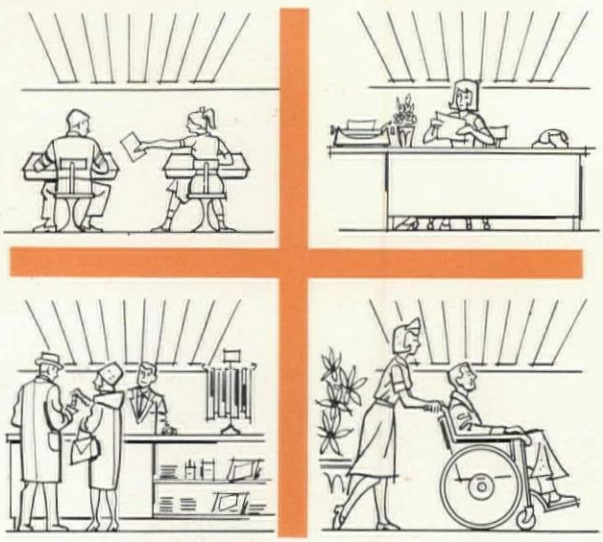
THE EXPERIENCE . . .

As a leader in the field of Air Handling Troffers, Sylvania now has hundreds of smooth-functioning installations of all sizes in all parts of the country. Sylvania representatives are trained and experienced to give you expert help with your problem.

THE EQUIPMENT . . .

Sylvania's Air Handling Troffers are designed and built specifically to provide long-lasting performance and to incorporate user benefits as well as practical installation and maintenance features . . . Miracoat finish, double-protection CBM ballasts, silver plated lamp holders, wide variety of shielding and compatibility with all popular ceiling systems.

THE VERSATILITY . . .



Because each job has its own requirements, Sylvania offers complete versatility of equipment so that the air handling troffer fits the installation as the designer has intended and specified.

COMPLETE TECHNICAL INFORMATION IS AVAILABLE ON REQUEST FOR ALL SYLVANIA AIR HANDLING TROFFERS

SYLVANIA LIGHTING PRODUCTS
A Division of SYLVANIA ELECTRIC PRODUCTS INC.
One 48th Street, Wheeling, W. Va.

SYLVANIA

SUBSIDIARY OF
GENERAL TELEPHONE & ELECTRONICS GT&E

SA-465-250M

Elkirt Traversing Verticals ...worth looking into

ROTATION of 180 degrees with just 8 inches of hand movement.

NO METAL-TO-METAL CONTACT; Carriers of resilient, silent Delrin.

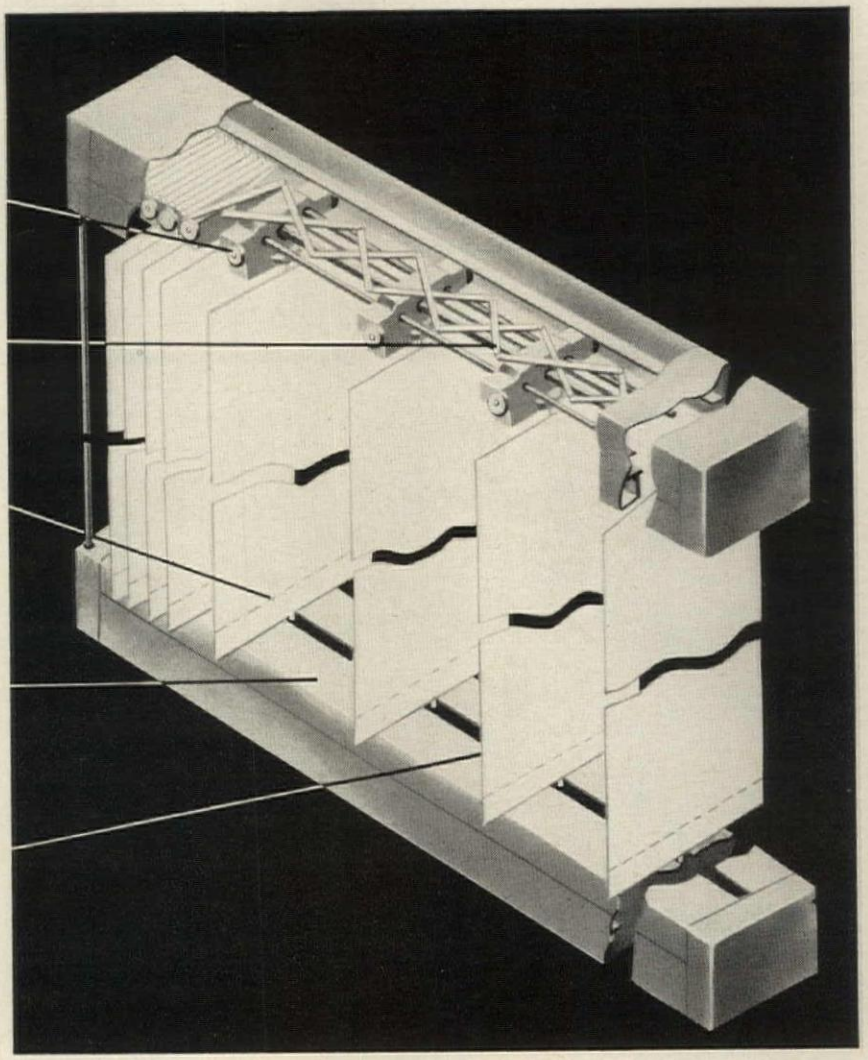
SPACING by a true pantograph system automatically gives even spacing.

NEW LOUVER SPRINGS outside the channel provide minimum light gap with constant, uniform tension — quick, fool-proof installation.

SNAP-ON TRIM eases installation and access to working parts . . . results in attractive Channel with only ¼ inch carrier gap.

VERSATILITY in choice of louver sizes in fabrics, metals and plastics is almost limitless.

TRAVERSES with no more effort than the average free hanging drape (*pounds of pull are almost identical*).



Take a good look at Elkirt's basic re-design of traversing verticals. It's a combination of imaginative engineering and devotion to quality which underlines Elkirt's continuing leadership in traversing and non-traversing verticals.

Elkirt traversing verticals now give the architect new dimensions in control of light, climate and design . . . with the important assurance of trouble-free, low-maintenance, "people-proof" functional beauty.

Principal Offices: Chicago, Dallas, New York, San Francisco.

Write to: Elkirt Verticals, Inc., P. O. Box 284, Des Moines, Iowa 50301 for Catalog.

Refer to Sweet's Catalog 18 d-EL

ELKIRT
VERTICALS INC.

Almost As Important As The Window Itself!

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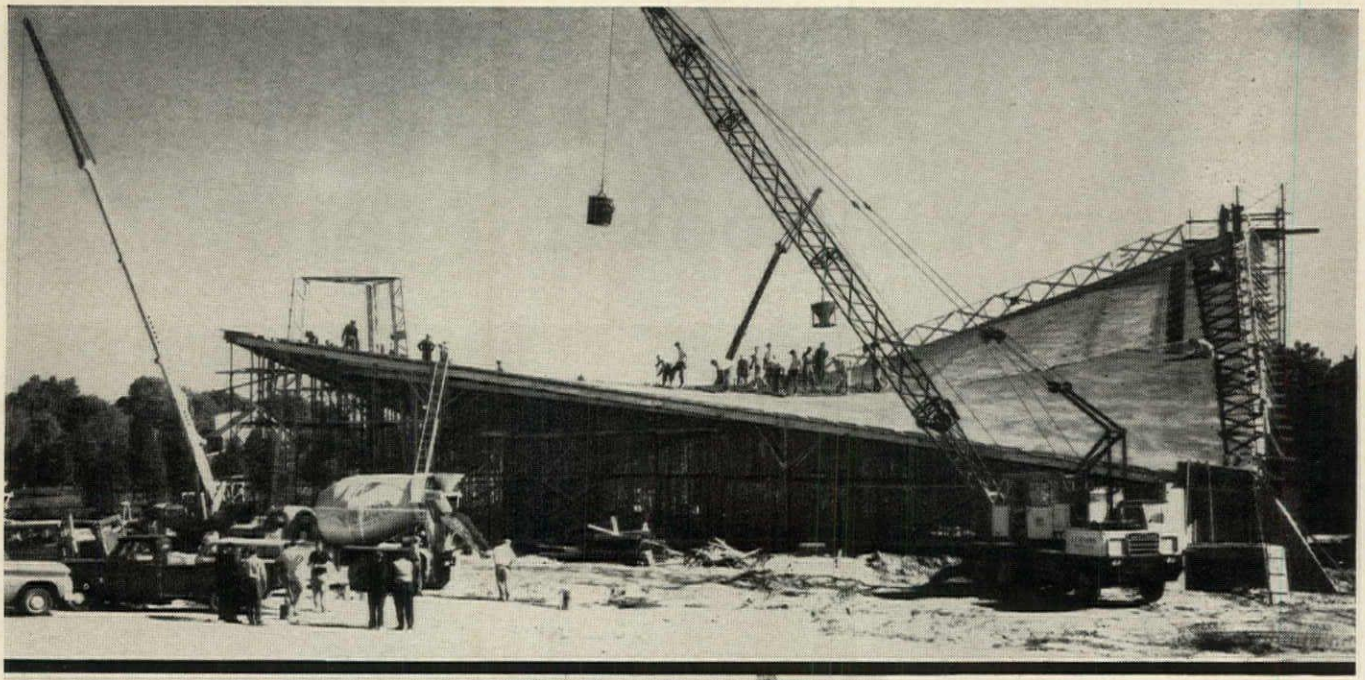

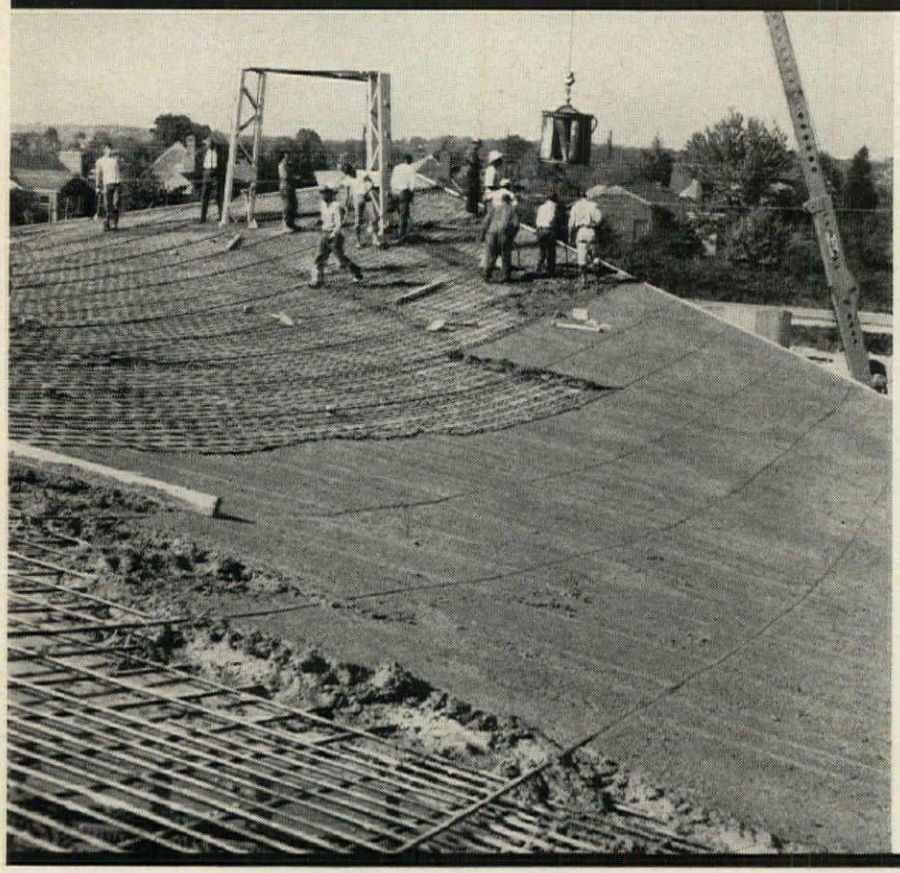

Buttresses consist of two intersecting legs —each leg, a truncated right triangle with a 16′ base, 16′ high and 30″ deep. The two peaks of the giant roof are 62′ and 27′ from grade.

Architect:

J. Allan MacLane, A.I.A., of MacLane & Chewning, Washington, D. C.

Structural Engineers:

Smislova & Carcaterra, Silver Spring, Md.

Contractor:

Sherman Construction Corp., McLean, Va.

Ready Mix Concrete:

Virginia Concrete Company, Springfield, Va.

Concrete for the entire hyperbolic paraboloid roof of Queen of Apostles Roman Catholic Church was placed between 8 AM and 4 PM. The edge beam, poured integrally with the roof, tapers from 20″ deep at the buttresses to 10″ deep at the high points. Each axis of the roof is 168′.

Concrete For Huge H/P Roof Placed in 8 Hours

This graceful hyperbolic paraboloid church roof is 118′ square, projected to the horizontal, and is only 3½″ thick. It is supported by two concrete buttresses connected by a below-grade tie beam. Under this clear span roof, the nave will seat 1500 people.

The coordinated planning of Sherman Construction Corporation and Virginia Concrete Company resulted in the continuous placing of 214 cu. yd. of lightweight concrete in 8 hours. Here, as in construction jobs throughout the country, Lehigh Cements contributed to the quality concrete supplied.

LEHIGH CEMENTS

Lehigh Portland Cement Company, Allentown, Pa.

New del Prado Terraflex®...the flooring with a Spanish accent

But it's a *subtle* accent. The kind you can use wherever a unique type of design is called for. That's because del Prado Terraflex is at home with any decor. Early American, Danish Modern—even French Provincial—are excitingly complemented by the aristocratic charm of this new J-M vinyl-asbestos floor tile. It's ideal for moderate traffic areas in commercial and industrial buildings, too. The deeply embossed surface resists fading, abrasion, even spike heels.

Del Prado Terraflex is available in four pastel shadings and comes in 12 x 12" tiles, 3/32" thickness. For more details about del Prado and the complete line of beautiful J-M flooring products, see your J-M representative. Or, write to Johns-Manville, Box 111, New York, N. Y. 10016. In Canada: Port Credit, Ont. Cable: Johnmanvil.

TERRAFLEX FLOORING IS ONE OF MANY QUALITY HOME-IMPROVEMENT PRODUCTS MADE BY **Johns-Manville**

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A monthly roundup of reports on new books of special interest to architects and engineers

This Month's Books

Designing Center City

THE HEART OF CITIES. *By Victor Gruen. Simon & Schuster, 630 Fifth Ave. New York, N.Y. 368 pp., illus. $8.50.*

A Review

By Albert Mayer

This is a lively book, witty and wise. The observation is sharp, the diagnosis often trenchant, and the phraseology often fresh and original. One chapter is headed "Full Speed Ahead on a Dead-end Road." In this Mr. Gruen analyzes with uproarious deadpan accuracy what would happen to the center of a specific city if all the wonderful radial roads were built to bring in the wonderful cars into terminal garages and street system. You've guessed it: complete immobility for all. But instead of just saying, Mr. Gruen mathematically proves it out. He shows in "Part Three: The Counter Attack" how this *can* be solved by a combination of mass transit, loop roads, loop garages, multi-levels, pedestrian resuscitation.

Some sagacious epigrams:

"If everybody were allowed to do as he wishes, nobody could do what he wants."

"The house beautiful in the city terrible is impossible."

"We are separating government workers from the public at large, confining them in ghettos called 'Civic Centers'."

I am grateful to the author for the amount of creative space and excellent illustration and analysis he has devoted to his native Vienna. One is accustomed to think of that delightful city in many different pleasurable ways. But I for one had not been fully aware of the planning-development lessons it has for us. Next time I go there, I will certainly take along the pages on Vienna's plan.

Mr. Gruen has within his own limits completely fulfilled the promise of his title: The Heart of Our Cities. He has presented philosophic, functional, analytic, imaginative thoughts and accomplishments. He has well developed the thesis that for a successful city center, human circulation, and particularly the pedestrian kind, must be considered the paramount purpose; that vehicular traffic, service, utility functions must be efficiently subordinated; that the two must not cross each other or cross each other up. He develops rather brilliantly the anatomic analogies, with particular reference to the constituent cells of the biologic organism and their counterparts in the structure of the city and of the metropolitan area.

What he does not do is to fulfill the obligation of the sub-title—The Urban Crisis: Diagnosis and Cure. For almost 100 per cent of his attention is devoted to the restoration, or rather the creation, of the glittering center, making it a frictionless, handsome, regional cynosure with mass transit and other approaches from the region which do not interfere with the local cells on the way. But while the book is filled with glamorous photographs of the city centers, there is not even one photograph of a cellular center where the people actually live. Mr. Gruen has a number of interesting or fascinating stories and anecdotes of his encounters with major businessmen and major political officials (the power structure): not one dealing with any constituent local community, any of the cells.

The great center has had a lot of brilliant attention and performance, none more glittering than from Mr. Gruen. But the local glitter, the local spiritual identifications—these are really at the heart of the urban crisis and solution—and these get scarcely more than a nod.

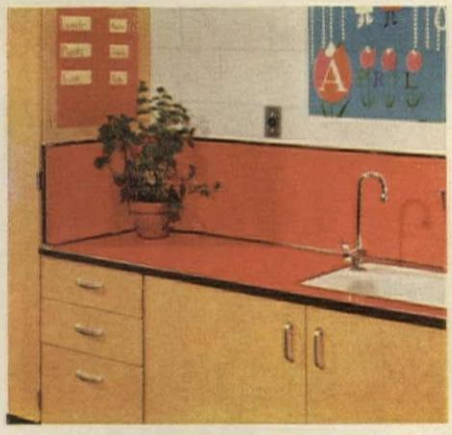
No one can do everything, and he has done a fine job, in his book and in his practice on his chosen level. I simply make the point that this is far from being "diagnosis and cure" for "the urban crisis," which is more pervasive, deep-seated, widespread, local spiritual-social than anything he deals with.

The chapter "The Emerging New Urban Pattern" goes into a provocative diagram-synthesis of the cellular metropolis, culminating in an excellent fold-out representation. This is first-rate, and deserves careful study. I hope that in his practice, and in his next book, he will be able to give some case histories of his contacts and accomplishments in the cells and with their people, equalling in raciness and understanding and poignancy and devotion what he has recounted here of the power center. The fact is, the fact sharply is, that we need desperately and urgently on these local planes—on pilot scale, and then on universal scale—the greatest available talents and concentrations and dedications. But we don't yet have them.

And by the way, if he does this he

continued on page 56

These cabinets must resist endless bumps... thumps... knocks... smears... spills...



...so National Industries specifies Nevamar!

Cabinetry by National Industries not only defies time . . . it ignores it. The secret is in Nevamar laminated plastic surfaces. Round-the-clock punishment won't faze Nevamar . . . even repeated dousings with boiling water and disinfectants can't mar its gleaming beauty. Here at last is cabinetry for school, hospital, church and kitchen that is completely and everlastingly maintenance-free. □ Quality features like this have helped make National Industries, Inc. the world's largest manufacturer of laminated plastic cabinetry. One inspection will tell you why National Industries specifies Nevamar. For literature and specifications, write: National Industries, Inc., Odenton, Maryland. □ Look for the Nevamar label. It is your assurance of enduring beauty, uncompromising quality, and trend-setting new finishes.

NEVAMAR®

The NEVAMAR Company, Odenton, Maryland A Division of National Plastic Products Company, Inc.

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Required Reading

continued from page 52

will find out something: that you cannot put every conceivable glamorous enterprise into the major center without sucking up from, and depriving the localities of, cultural and focal and governmental elements that rightly or equally belong there, and deprivation of which leaves the matrices of our cities and regions bereft of elements which both for administrative economy and social identification preferably belong there. This may not be true on the Rochester scale, but in my opinion is definitely the case on the scale of Mr. Gruen's hypothetical 3,300,000 metropolitan area.

The practice of doing this center-concentration is also a kind of "Ghetto-ization."

New York City

CLASSIC NEW YORK, Georgian Gentility to Greek Elegance. *By Ada Louise Huxtable. Anchor Books, Doubleday & Company, Inc., Garden City, New York. 142 pp., illus. Paperbound, $1.95.*

This is the first of a six-volume series of guides to New York City architecture by Mrs. Huxtable. The author here limits herself to remaining examples from the Georgian and the Greek revival periods. But the original concept of a guide to New York architecture in a single compact volume, easy to carry on architectural walks, proved unworkable, and the scheme of six small pocket-books, each devoted to one distinctive period or style, was adopted to preserve the idea of portability. They will be "organized as history, but meant to be used as guides." In this first volume, illustrations are plentiful and pertinent. Mrs. Huxtable's style is entertaining and highly readable. Her underlying editorial purpose is to "open the way to a more general appreciation of a wider range of the city's architecture, and to the kind of preservation that will make the past a proper part of the present and the future." The author's first concerns, she says, are "the quality, interest and variety of the New York city-

continued on page 64

Ever wonder why al the other vinyl ads show tile already on the floor?

They'll probably say you can't visualize it on a floor nless they show it to you in a room setting. But we y, from twenty feet away you can make almost any- ing look good.

Then you finally get to see the real thing and boy! hat a letdown.

It doesn't seem quite as thick. It's a little less rich oking. And it's certainly a far cry from what ou thought you saw in the magazine.

That's why we're not resorting to fancy set- ngs or tricky lighting for our designer Nancy ayer's latest solid vinyl achievement, Appian. ere it is. Up close.

Exactly what you'll see when you pick up in your own hand.

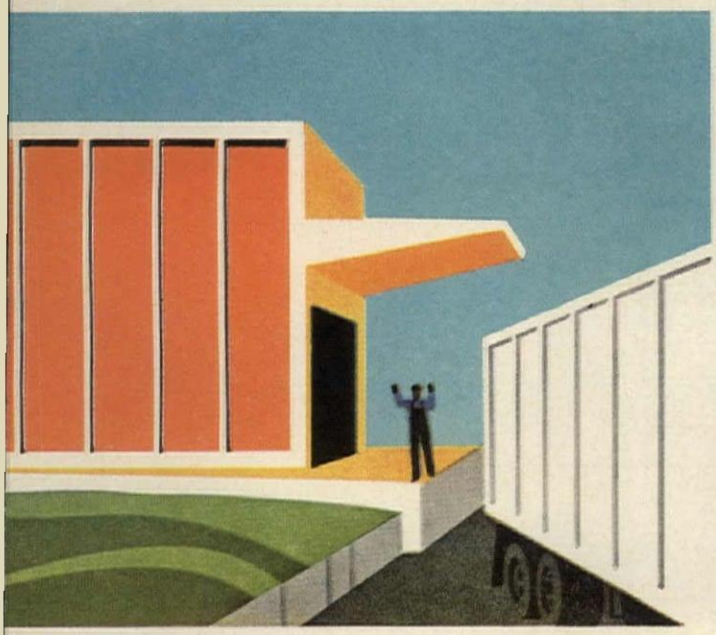
Thick, luxurious solid vinyl. With a surface so deeply etched and authentic, you have to look twice to make sure it really is vinyl.

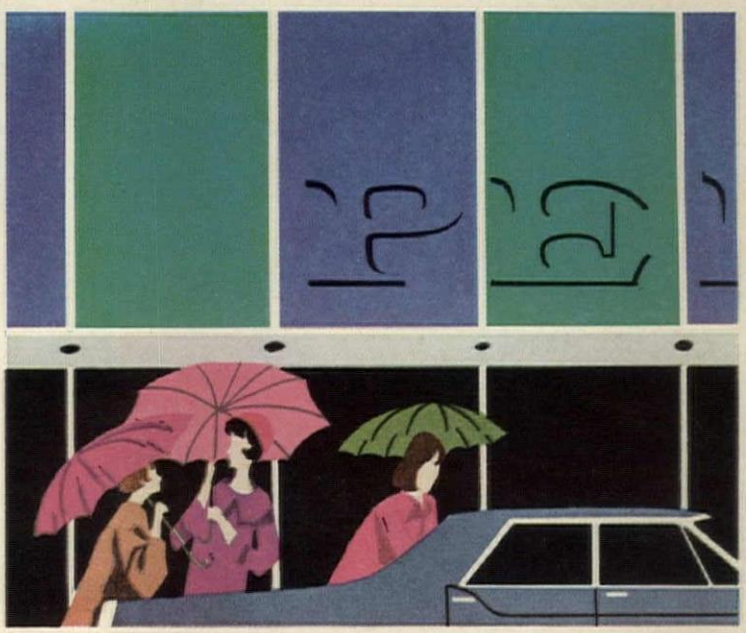
Now you've seen what Appian looks like in your hand. If you live in New York, Chicago, Los Angeles, San Francisco or Dallas, stop by at the Amtico showroom. You'll see how it looks on our floor.

But if you ask us, we'd much rather see Appian on your client's floor. So write for free samples and let's get started.

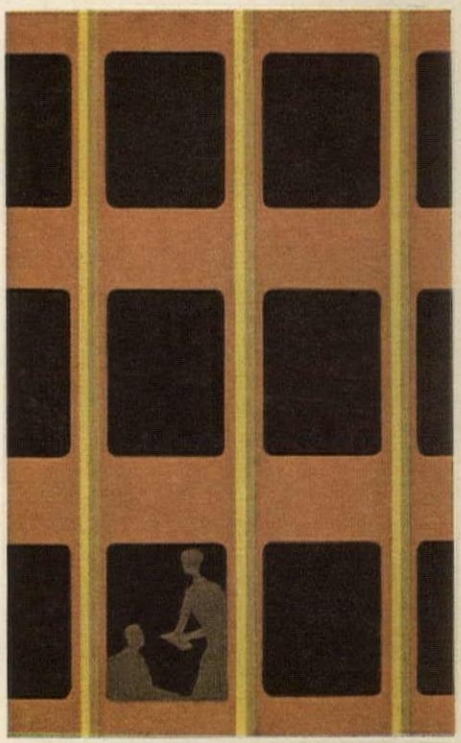
AMTICO

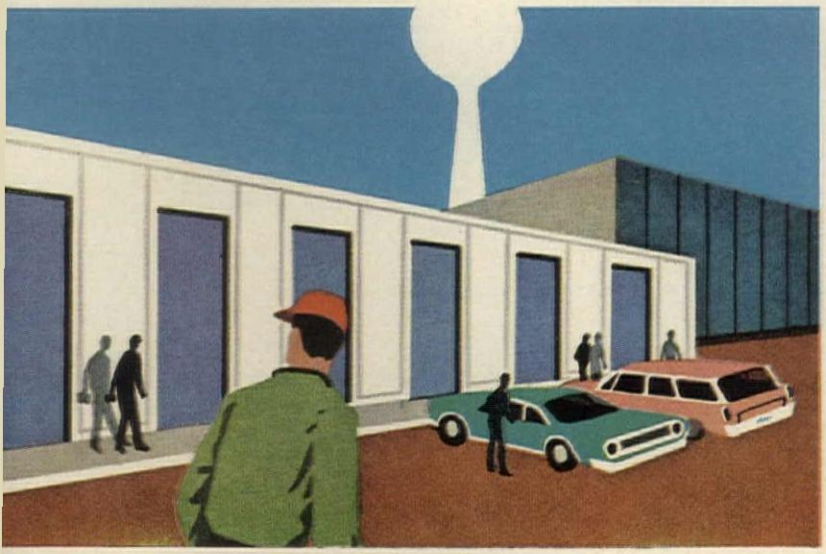
American Biltrite Rubber Co., Inc.
Trenton 7, N. J.

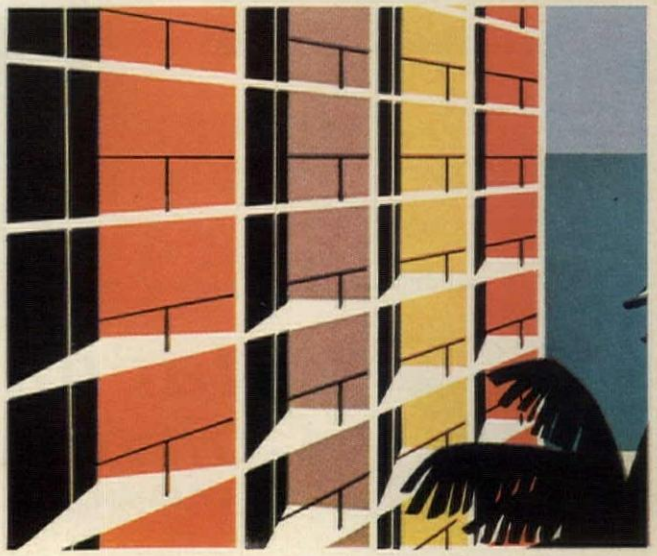


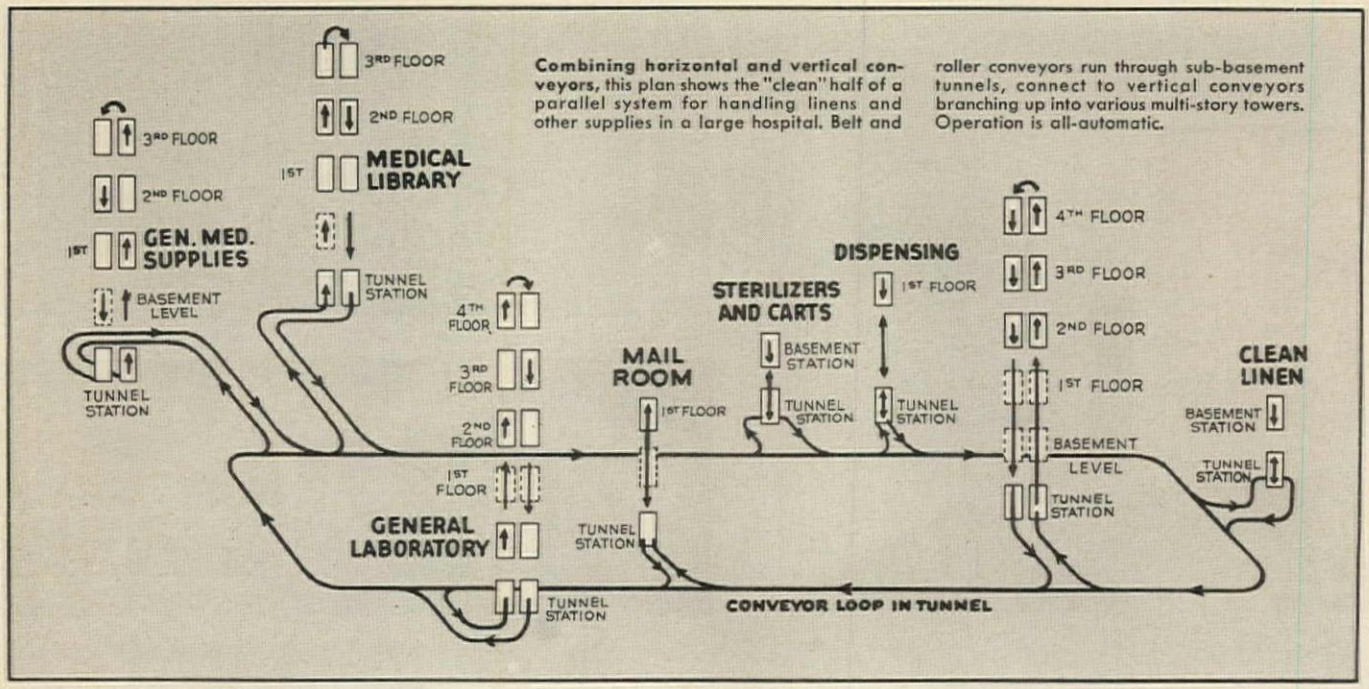


Finishes using KYNAR 500* are made by leading paint manufacturers. Tests by these manufacturers . . . and by Pennsalt . . . project 30 years or more of useful maintenance-free life on metal building parts. ☐ With these new finishes, you can get a range of sheens; perfect color matching; long term resistance to sunlight, corrosive chemicals; economy in initial and maintenance costs; simple on-site repair of finish. ☐ When designing or building warehouses, store fronts, high rise structures or factories, use building components protected with beautiful, durable finishes of KYNAR 500. Write for booklet, "Finish with a Future . . . KYNAR 500!", plus names of fabricators supplying these building components. Plastics Department, Pennsalt Chemicals Corporation, 3 Penn Center, Philadelphia, Pennsylvania 19102.



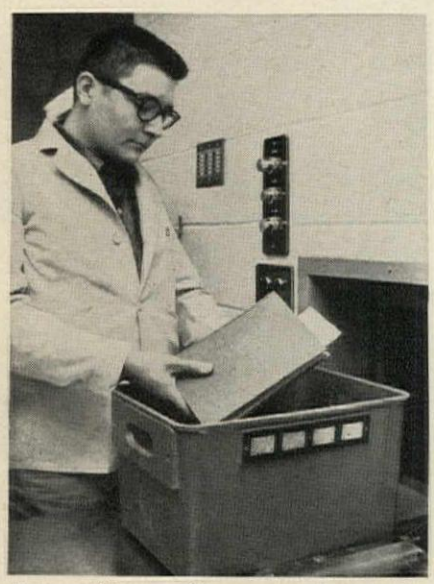






Combining horizontal and vertical conveyors, this plan shows the "clean" half of a parallel system for handling linens and other supplies in a large hospital. Belt and roller conveyors run through sub-basement tunnels, connect to vertical conveyors branching up into various multi-story towers. Operation is all-automatic.

Pushbutton conveyor system speeds hospital supplies to any of 17 stations



Automatic control is an integral part of a Recordlift System. It employs the magnetic tab principle of conveying encoded digital information—one of the most reliable, economical, maintenance-free systems devised.

Operation is fast and automatic. Operator simply loads the basket, places it on the loading station, pushes the proper button for the desired destination—and away it goes!

PLANNING for materials handling in multi-story buildings can become an easy matter—when you specify a STANDARD CONVEYOR *Recordlift* System.

A *Recordlift* System *unifies* a building. General supplies, mail, records, files and other materials go up, down, and throughout the building at the push of a button. The cost and congestion of interfloor messengers is saved—speed and efficiency are gained.

Ideal for hospitals

Widely used in office buildings, banks, libraries, etc., *Recordlift* Systems have long proved ideal for handling hospital supplies.

The plan above, for example, shows the "clean" portion of an extensive double *Recordlift* System being designed for a new 700-bed hospital.

Has two-lane traffic

Two separate horizontal-vertical conveyor systems will run side-by-side throughout the building complex. One will handle clean linen; the other, soiled. The systems will also handle mail, books, records, forms, publications, medical supplies, instruments and lab specimens.

There are 17 pushbutton stations on the clean system, 14 on the soiled. The entire double system has about 4,300 feet of conveyor—3,000 feet horizontal. The vertical footage includes 8 *Recordlifts* and 12 reciprocating lifts.

Provisions are included for adding 7 more stations to the clean system and 8 more to the soiled.

Dispatching is simple

Any station can send to any other station in each separate system. For reasons of cleanliness, the two systems do not connect at any point.

Dispatching is simple, fast and selective. The operator merely loads the 20½" x17½"x10" container (2 will hold a complete change of linen for 3 beds), pushes the button for the proper station, and the system delivers it.

Write for data file

If you are concerned with multi-story buildings which call for streamlined distribution of everyday supplies, be sure to investigate STANDARD CONVEYOR *Recordlift* Systems.

Write today for an illustrated data file. Or simply clip this ad to your letterhead and mail it.

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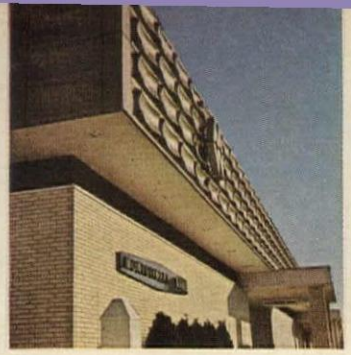

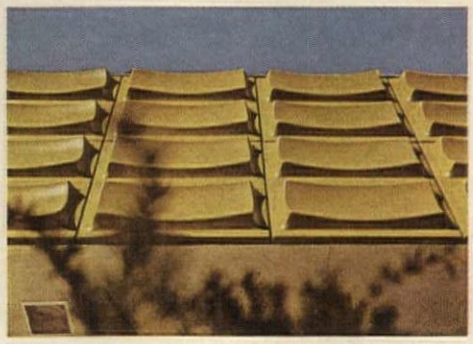

For sculptured facings... PLEXIGLAS

Calumet Shopping Center, Munster, Indiana, is an outstanding example of the form, color and texture effects achieved with formed facings of PLEXIGLAS® acrylic plastic. Because PLEXIGLAS forms easily, panels can be produced economically in sculptural shapes which can't be obtained with most widely-used facing materials.

Note the varying patterns of highlight and shadow on the Calumet Shopping Center panels, caused by the changing position of the sun.

PLEXIGLAS is rigid, strong and weather resistant. It is light in weight and inexpensive to install. PLEXIGLAS is available in a broad range of semi-opaque and translucent colors. Translucent panels may be backlighted for luminous facades.

For further information on the design possibilities with facings of PLEXIGLAS, write for a copy of our brochure, "Plexiglas for Facing Panels."

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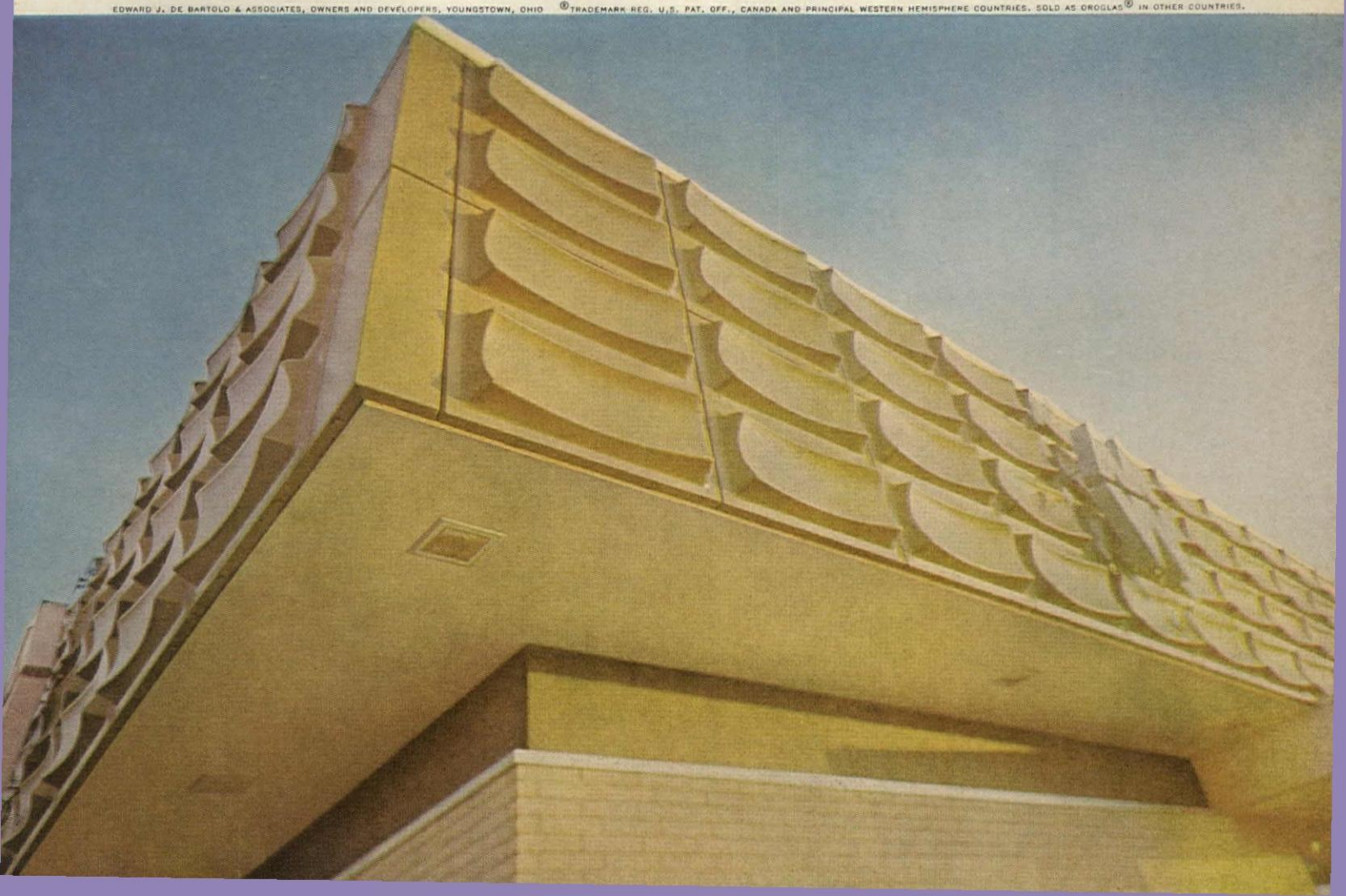

Required Reading

continued from page 56

scape, as well as the preservation of that quality."

Outdoor Churches

THE OPEN-AIR CHURCHES OF SIXTEENTH-CENTURY MEXICO. *By John McAndrew. Harvard University Press, Cambridge, Mass. 755 pp., illus. $15.00.*

This scholarly treatise will undoubtedly interest not only specialists in early Mexican architecture but all architects concerned with the history of church architecture. The author shows how the open-air church of the Indian of Mexico was a bold break with Christian tradition, and makes clear the conditions which affected its forms.

The book is generously illustrated with photographs, drawings, old prints and maps.

Historic Sites

COLONIALS AND PATRIOTS. *By Frank B. Sarles Jr. and Charles E. Shedd. Edited by John Porter Bloom and Robert M. Utley. Superintendent of Documents, United States Government Printing Office, Washington, D.C., 20402. 286 pp., illus. $2.75.*

This guidebook into history is volume six in the series of studies of the National Survey of Historic Sites and Buildings. The survey's purpose is the evaluation of places important in United States history and pre-history.

The volume is divided into two parts, the first offering a brief historical background for the period 1700-1783 in American history. The second part consists of classified, evaluated descriptions and drawings of historical places which pertain to the same historical period. Historians and archeologists of the National Park Service, U.S. Department of the Interior, after comprehensive fieldwork, prepared the studies on which this volume is based.

continued on page 72

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Why apologize to a client for paint failure?

Don't let it happen in the first place.

Specify a binder that meets the newest government specifications. One of our PLIOLITE® resins.

For example, new government specification TT-P-0097, for painting exterior masonry, requires "the nonvolatile matter of the vehicle shall contain at least 50% Styrene-Butadiene or Styrene-Acrylate." PLIOLITE S-5 and PLIOLITE AC qualify. Paints based on PLIOLITE form tough protective films that grip well—even to chalky surfaces. Finishes last longer, in any climate. Won't blister, peel, flake or fade prematurely. And they're economical, because they help your client avoid costly repainting.

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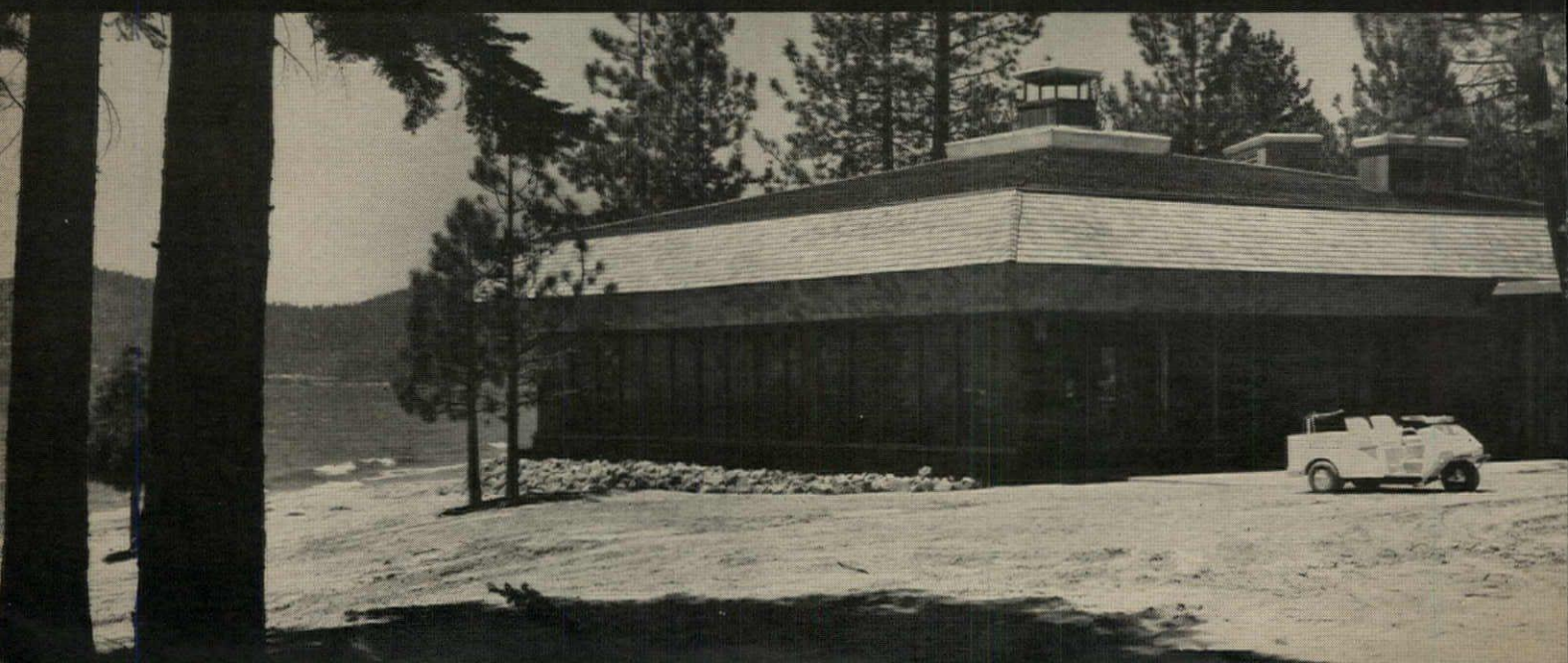
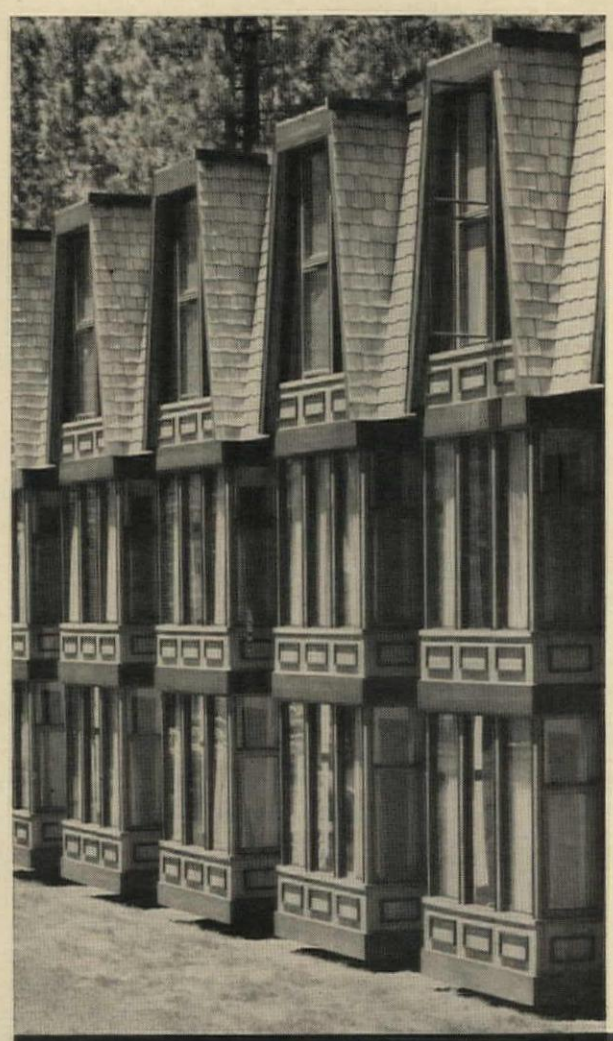
Red Cedar Shingles and Handsplit Shakes





The new Sierra Tahoe Lodge at Incline Village, Lake Tahoe, Nevada, has the tingle of elegance about it. Yet it also seems to say "make yourself at home." Part of this appeal — and part of the elegance, too — is a characteristic of the roof material used: Red Cedar. Notice also how well the Red Cedar shingles used here adapt to the various designs used on the site. Aesthetics aside, Red Cedar shingles and handsplit shakes are eminently practical on a roof or sidewall. They're strong, light in weight, durable, dimensionally stable in all kinds of weather, and they insulate. Altogether, a sound business proposition. If you'd like more information, just write the Red Cedar Shingle & Handsplit Shake Bureau, 5510 White Bldg., Seattle, Washington 98101. (In Canada: 1477 West Pender St., Vancouver 5, B.C.)

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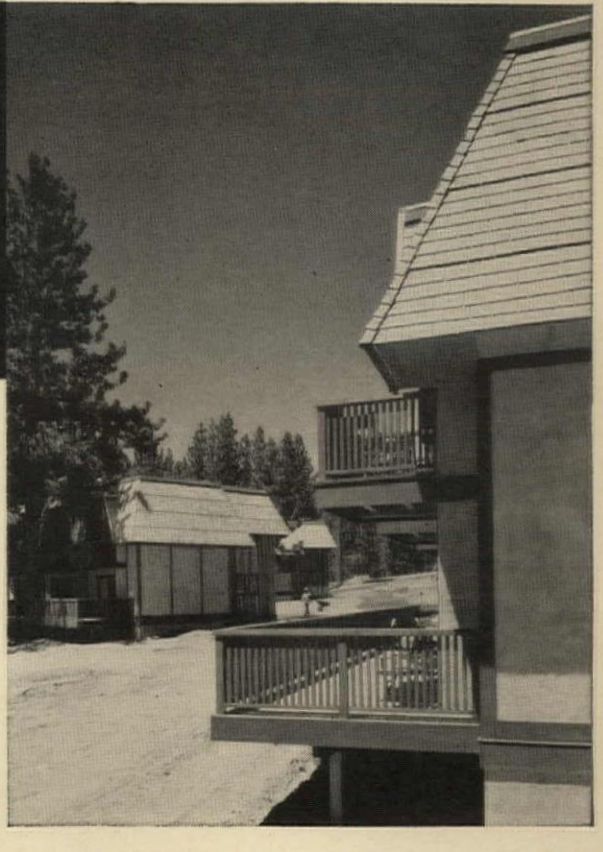

Architect Charles Warren Callister and project associate John S. O'Brien specified Certigrade Blue Label No. 1 shingles, 16" long, with 5" weather exposure. The 3-story lodge hotel (*both upper photos*) has a thatched mansard application. The beach pavilion restaurant (*lower left*) shows a straight application with a reverse mansard roof while the lodge's 2-story shoreside cottage group features doubled courses every sixth row. The site is bisected by a two-lane highway, spanned by a shingle-covered footbridge wide enough to accommodate electric carts. Donald Sandee was associate architect on the hotel building.

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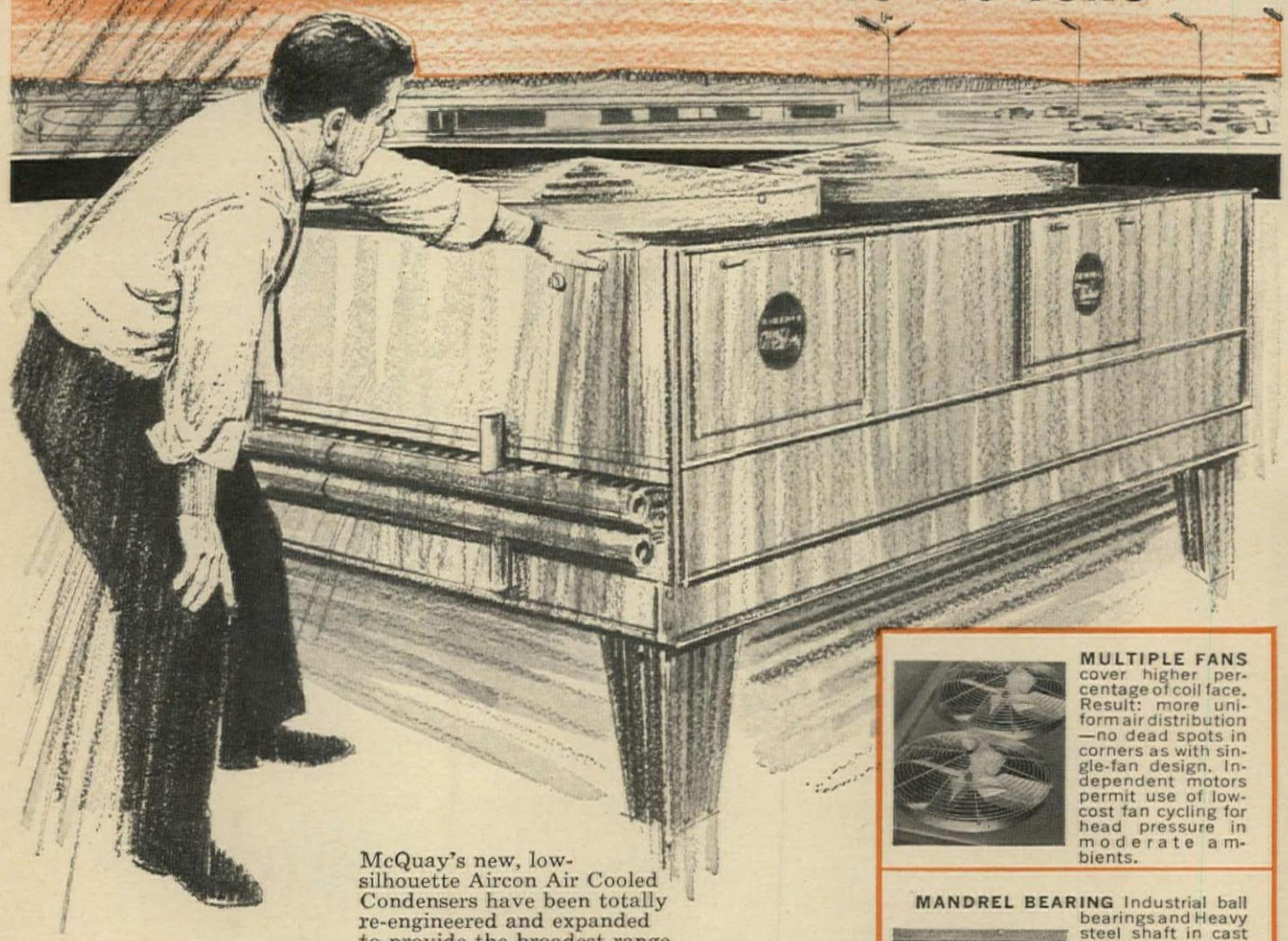

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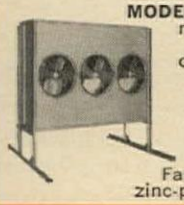

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HOW ARCHITECTS PRACTICE INTERIOR DESIGN—PART 2

Business and commercial spaces

By William B. Foxhall

Postwar changes in the character of office buildings and in the techniques of business have added new professional dimensions to the design of commercial interior spaces. Virtually universal air conditioning and higher levels of illumination, for example, have imposed their own more or less fixed patterns and requirements for unimpeded distribution which must be accommodated in any system of partitioning. They have also contributed to rising costs per square foot, now exerting insistent pressure on a demand for efficient use of space and raising management's assessment of interior design and decoration to a new level of relative importance.

The burgeoning technology of business, too, has had profound effect, not only on the physical aspects of buildings but on the task of arranging business operations within them. As machines and computers, for example, increase the scope and speed of clerical work, communications and the modes of physical transport must keep pace. The devices of technology occupy space in ever-changing amounts; but more significantly they can affect basic management decisions about selection of one or more new locations to accommodate new operations.

Professional Coordinator

These decisions cannot be made in the two-dimensional world of so many bodies and desks on a given floor. They involve considerations of traffic flow, operating relationships, real estate and construction costs, the character as well as the sequence of spaces and, most urgently of all, people in their total community. In short, these management decisions depend in large part upon the sound advice and special skills of the experienced architect.

The key role of the architect in the design of commercial interiors lies in his capacity to assemble and assess the required expertise in economic, engineering, esthetic and even legal considerations. The complex elements of the total business environment are not separable, one from another, and it is the unifying artistry inherent in the architect's profession that gives him a compelling primacy in this field.

"We are architects," says J. Gordon Carr, "the same as any other architectural firm. The fact that 80 per cent of our staff time is devoted to interior space design is a result of our particular growth pattern. It does not reflect any special kind, limitation or re-definition of architecture. It is perhaps a combination of personal qualification and the existence of a great need for professional services in this field that accounts for our particular staff balance." Mr. Carr's training is in architecture and business administration. The postwar development of factors mentioned above provided a special opportunity for this combination of talents.

Clients seeking spaces in new commercial buildings were in need of a whole new array of services, most of which related to the techniques and skills of architecture. There was need, for example, for clearer documentation of leasing arrangement specifying what the landlord would do basically insofar as construction, elevators, lighting, flooring, etc. were concerned. These are the elements that establish the basic rent. They are detailed by the Carr office in a so-called "work letter" which becomes part of the lease. The work letter further stipulates what the landlord will do at a specified extra rent. This category includes extra air conditioning, lighting, etc. A third category outlines what the landlord will do at an agreed direct cost to the tenant. This category may include such items as redistribution of utilities or special structural requirements.

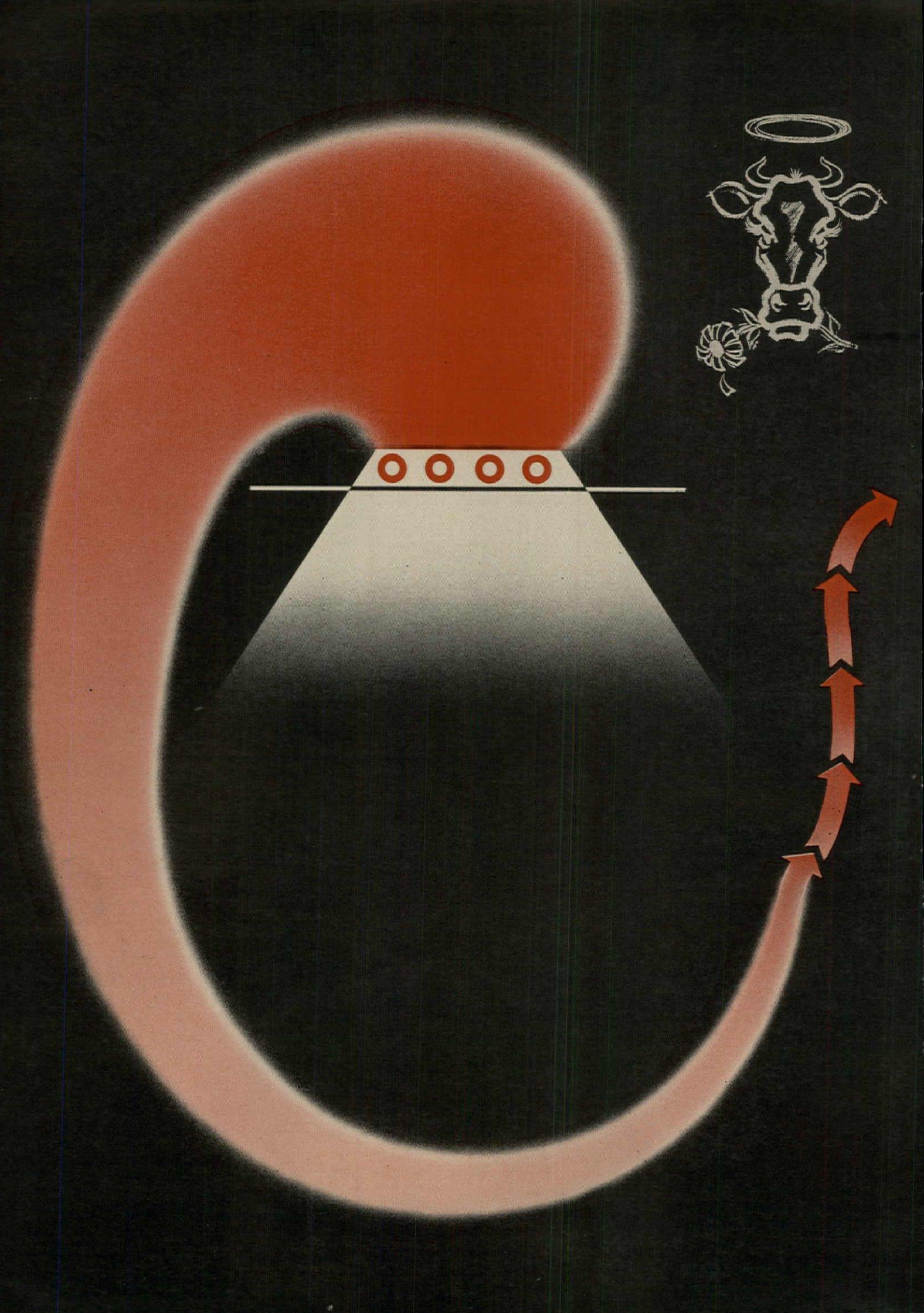
As Mr. Carr points out, a large prospective tenant for a commercial building under construction may, through his architect, exert considerable leverage in the provision of tenant preferences in the first category without upward revision of the basic rent.

A Complex Program

The complexity of commercial space design exceeds that of almost any other architectural service in that the programing process is likely to confront a continually shifting set of requirements. The company, for example, may decide to undergo basic management realignments generated in part by opportunities provided by the change of location.

continued on page 108

Part 1 of this summary of interviews appeared in the November 1964 issue of ARCHITECTURAL RECORD



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continued from page 105

There may be a decision to consolidate certain operations or to disperse other operations in outlying less costly space. There may be a re-examination of internal operations that can be successfully farmed out to established service organizations. It is this complexity which almost automatically imposes a fee based on time charges. The more experienced the designer, says Mr. Carr, the more certain he is that a fee fixed in advance or based on other than the architects' own costs is rarely possible to negotiate realistically.

A Separate Business

Some firms have found it convenient to set up their interior design operations as a business separate from the conventional architectural firm. One of these is the Atlanta firm of Finch, Alexander, Barnes, Rothschild, and Paschal who have set up a firm called Architectural Space Design Inc. as a wholly owned subsidiary. An example of this firm's work is shown at right.

William L. Pulgram, executive vice president and general manager of the interiors operation points to some of the advantages in this corporate set up. As an independent organization, it enters into separate contracts with the owner. This simplifies the fee schedule. It also permits the interiors division to solicit work as consultants to other architects although its services are still included in the architectural services of the parent organization. As an independent organization, it is not competing with other architects but can be employed by them or by the owners as they would employ engineering or other consultants.

Mr. Pulgram says: "Our company attempts to secure a contract simultaneously with, or as soon as possible after, the owner has engaged an architect for the building. When we are commissioned to prepare a space requirement analysis, we often begin before the building architect, since we actually prepare basic documents of the program. During other phases of our work, we attempt to develop our interior design in close coordination with the work of the building architect."

Kahn & Jacobs is another firm which found postwar work in business interiors developing to a point where a separate operation seemed warranted. This firm set up Kahn & Jacobs Designs, Inc., fully owned by partners of the parent firm; separate from but integrated at key points with other architectural activities of the partnership.

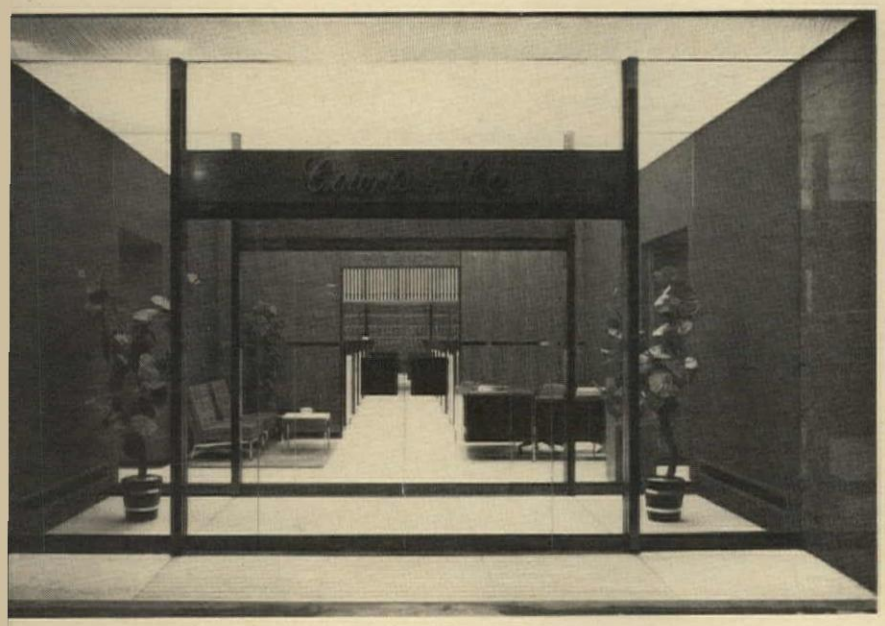
Space planning, says Edward Eagan who heads the interiors operation, begins with an analysis and inventory of a client's requirements. When a company plans to move or change its internal arrangements, the Kahn and Jacobs firm is prepared to ad-

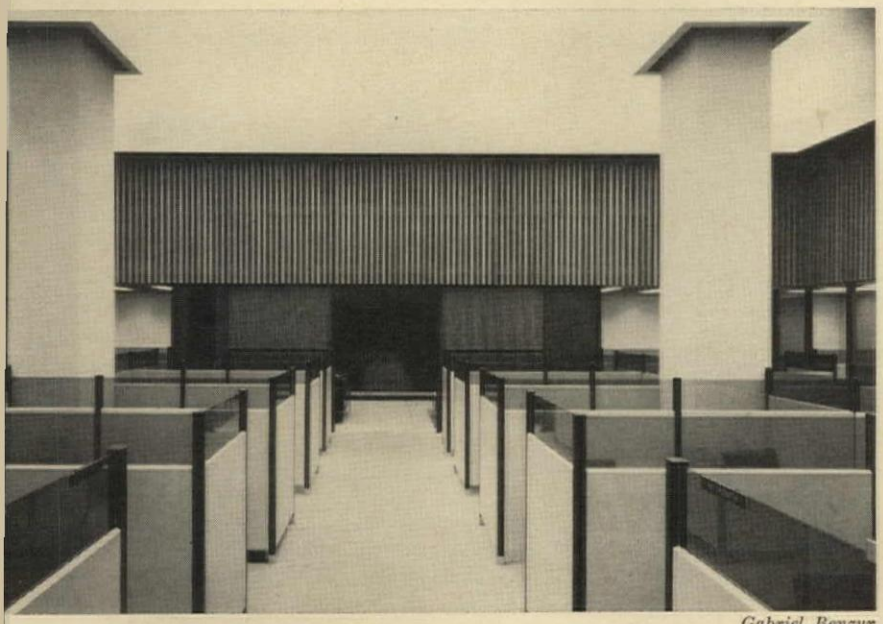
text continued on page 112

Gabriel Benzur photos

A BROKERAGE REDESIGNED

Outmoded equipment and overcrowded conditions (*above*) prompted Courts & Company, an Atlanta brokerage firm, to seek a more functional and pleasing interior design. Complete reorganization of the floor layout (*right*) has enabled facilities for the number of account executives to be increaseed by 20 per cent. Every staff member is located so that he has a satisfactory view of the constantly changing quotation board, and a system of paper conveyors links him with the teletype operator who places the client's order. Light is provided by a high luminous ceiling over the general office area with a lower ceiling in the executive offices to provide the more intimate environment desired for smaller spaces. Wall surfaces are generally neutral with accents of dark vinyl and wood. Carpets and upholstery fabrics inject color. Changes to the exterior of the building were held to a minimum to avoid interfering with the unity of the existing design. Regular business continued while remodeling was in progress. Owner: Courts & Company, Atlanta, Georgia; interior space planning and design: Architectural Space Design, Inc., a subsidiary of Finch, Alexander, Barnes, Rothschild, and Paschal, Architects





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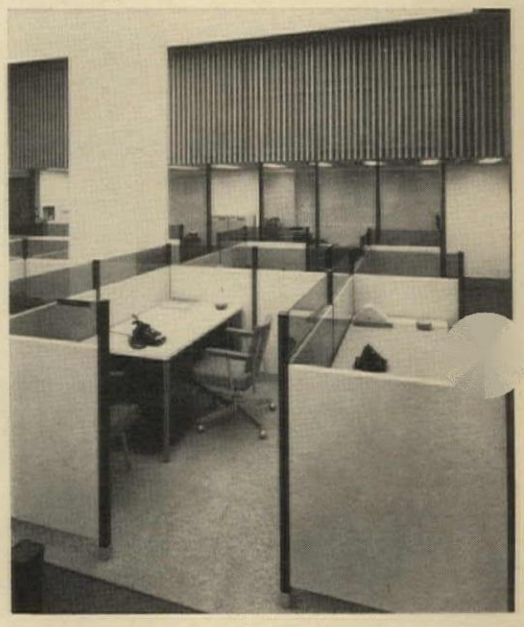

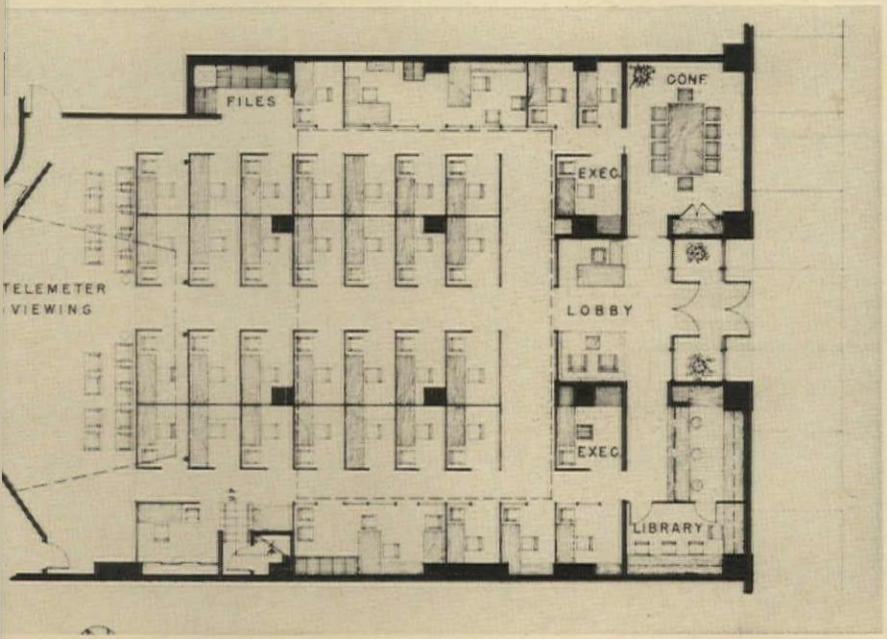

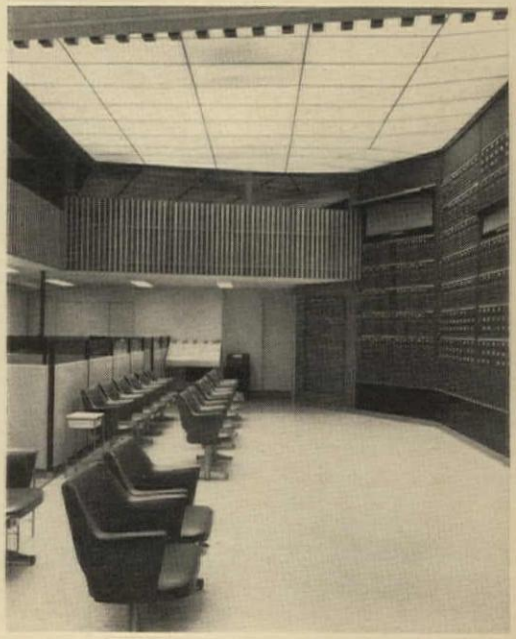

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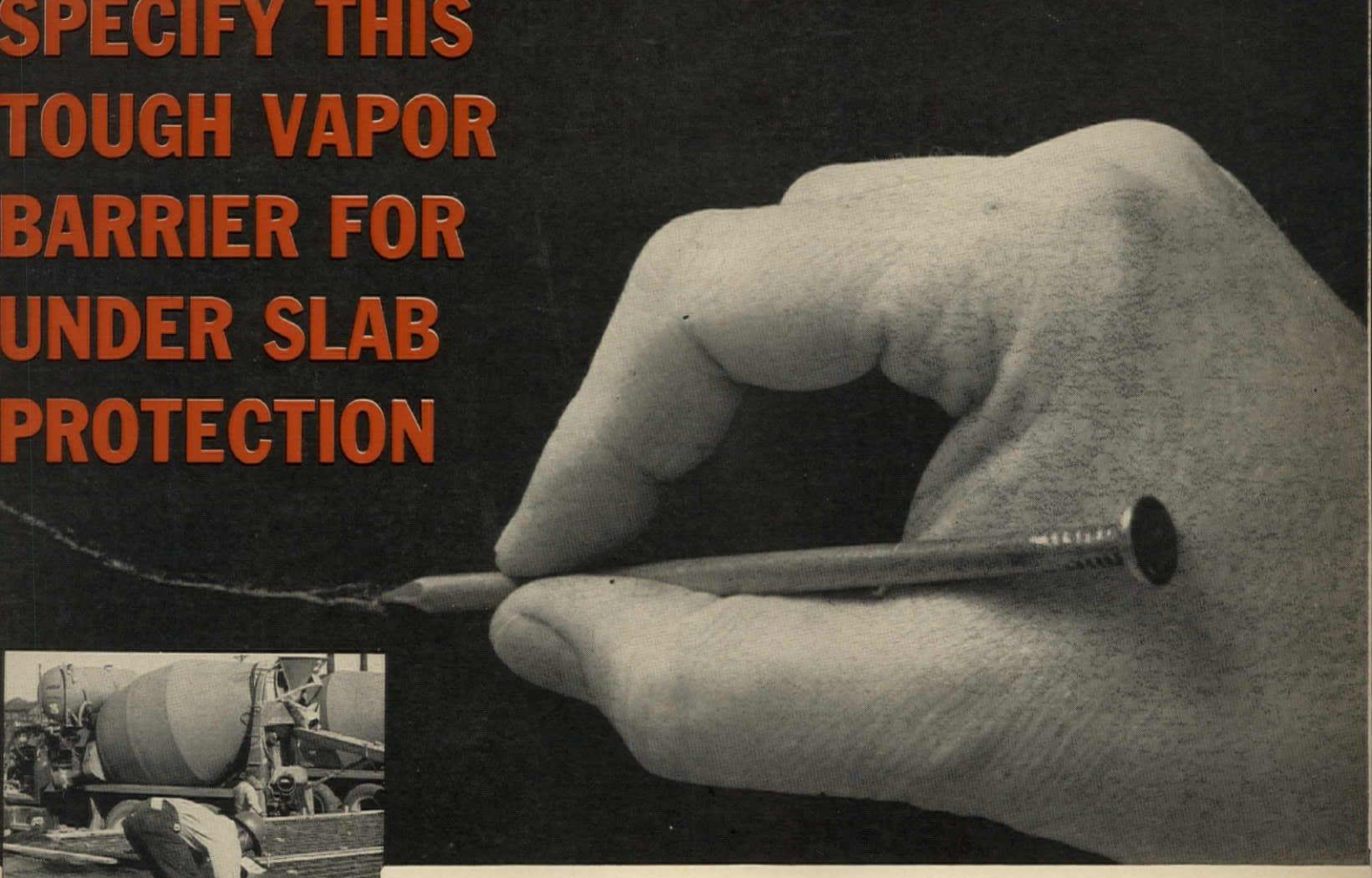

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continued from page 108
vise in matters bearing upon total space required and its general distribution on one, two or more floors, or for a new and separate structure if that seems indicated, displays of materials and furnishings are prepared and presented at programing conferences with the client. These conferences resolve details of balance and department relationships.

The preliminary planning phase then draws up the possible grouping and function of departments, shown as arrangements suggested for each prospective building location. These preliminaries are presented in sufficient detail to allow the client to see what his various requirements mean in terms of space and location.

Based on the client's choice at this point, advanced preliminary plans are drawn up and presented at conferences with the client and the landlord of selected leased space.

An outline specification of client requirements is prepared in conjunction with preliminary decorating and furnishing schemes. Upon approval, working drawings are prepared. Meanwhile, furniture and decoration objectives are worked upon and separate budgets of construction and furnishing costs are prepared. These budgets are separated because the landlord usually bears the construction cost while the client pays for furniture and decoration. The rest of the work parallels almost exactly the work of any other architectural commission.

A Specialty

Articulate protagonist of the professional approach to design of commercial interiors is Gerald Luss, vice president and director of design at Designs for Business, Inc. Trained in the department of architecture at Rensselaer and the department of interior design at Pratt Institute, Mr. Luss has developed his concept of the role of the interior designer over 17 years with this firm. Concurring with the general outline of postwar influences mentioned earlier, Mr. Luss stresses his belief that it is the professional experience of design firms that is a major factor in the growing demand for their services.

The planning, design and engineering of the thousands of details inherent in and peculiar to commercial space design are not necessarily the familiar province of all architects who plan buildings. The special conditions which have developed for all the reasons outlined have generated what Mr. Luss terms a special breed of interior architect or designer which sprang up to fill a specific void after World War II. This does not mean, he hastens to point out, that the architecture of interiors is in any way outside of, different from or peripheral to the total profession of architecture. It is more properly a concentration of attention to the intimate details of the total environment of people and their operating relationships—the fulfillment, if you will, of the primary function for which architecture of the building itself is the framing expression.

The void which Mr. Luss described was not so much an absence of primary architectural competence as it was a new and insistent demand for that functional fulfillment. It is perhaps significant of the architectural nature of that fulfillment that this firm which consisted of three people in 1949 grew in 10 years to 100 people and that 90 per cent of its staff today are architects.

But Mr. Luss does not hold the architectural profession blameless in some of the problems encountered in his work. Commercial rental space, he points out, has been a venture in design of the least costly building. In their pursuit of low cost construction, the architects of some commercial buildings have shown little inclination to relate their economic studies to the ultimate efficiency, flexibility and economy of the internal spaces. It is the longevity of those spaces for a variety of changing uses that determines the ultimate economy of the building and needs more attention from architects.

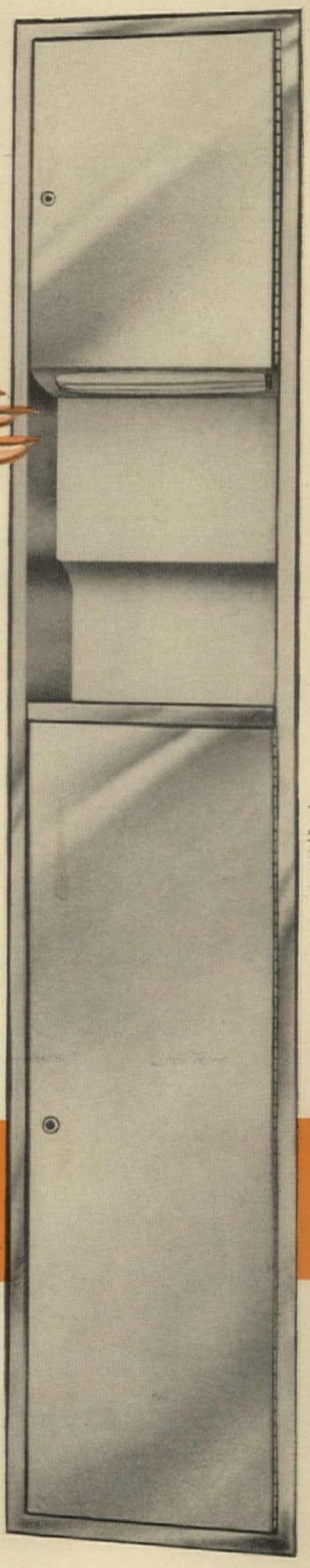
The practice of interior design, especially for commercial or educational purposes, is extremely specialized, says Mr. Luss. In order to practice competently in this field, architects must have access to professional knowledge of many fields. In its professional alignments, Designs for Business is retained in both design and consultant capacities. It may be retained with an architect; sometimes by the architect; sometimes before the architect.

Space Planning

So-called space planning, Bradley Sack of the New York office of Curtis and Davis points out, is a part of every interior design. It is the outline of flow patterns, and the arrangement of bodies and partitions. To this partial operation, the interior designer adds esthetic qualities including the selection of furnishings and finishes. He also applies such engineering as may be required for the structural elements and utilities. Every interior is in some way planned, but not every interior is designed. Ideally, the designer should be able to talk to the personnel for whom he is designing spaces so that work station detailing can relate to them in a personal way.

Space planning, says Mr. Luss, is the simplest and most elementary part of interior design. It's like the first fitting of a size 40 suit to a size 38 man. Decoration, too, although it calls for special talents, is a secondary part of the interior design job. The important function of the interior designer lies in his ability to analyze the relationships of people in a commercial situation where the flow of information and materials is a primary factor in the arrangement of mechanical equipment, utilities and furnishings in a total working environment.

5 GOOD REASONS WHY



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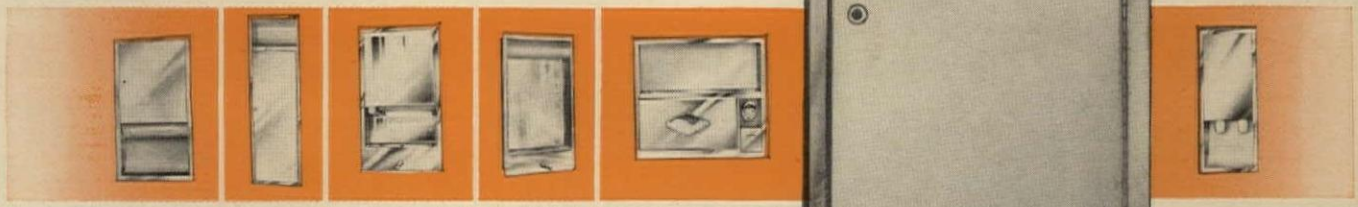

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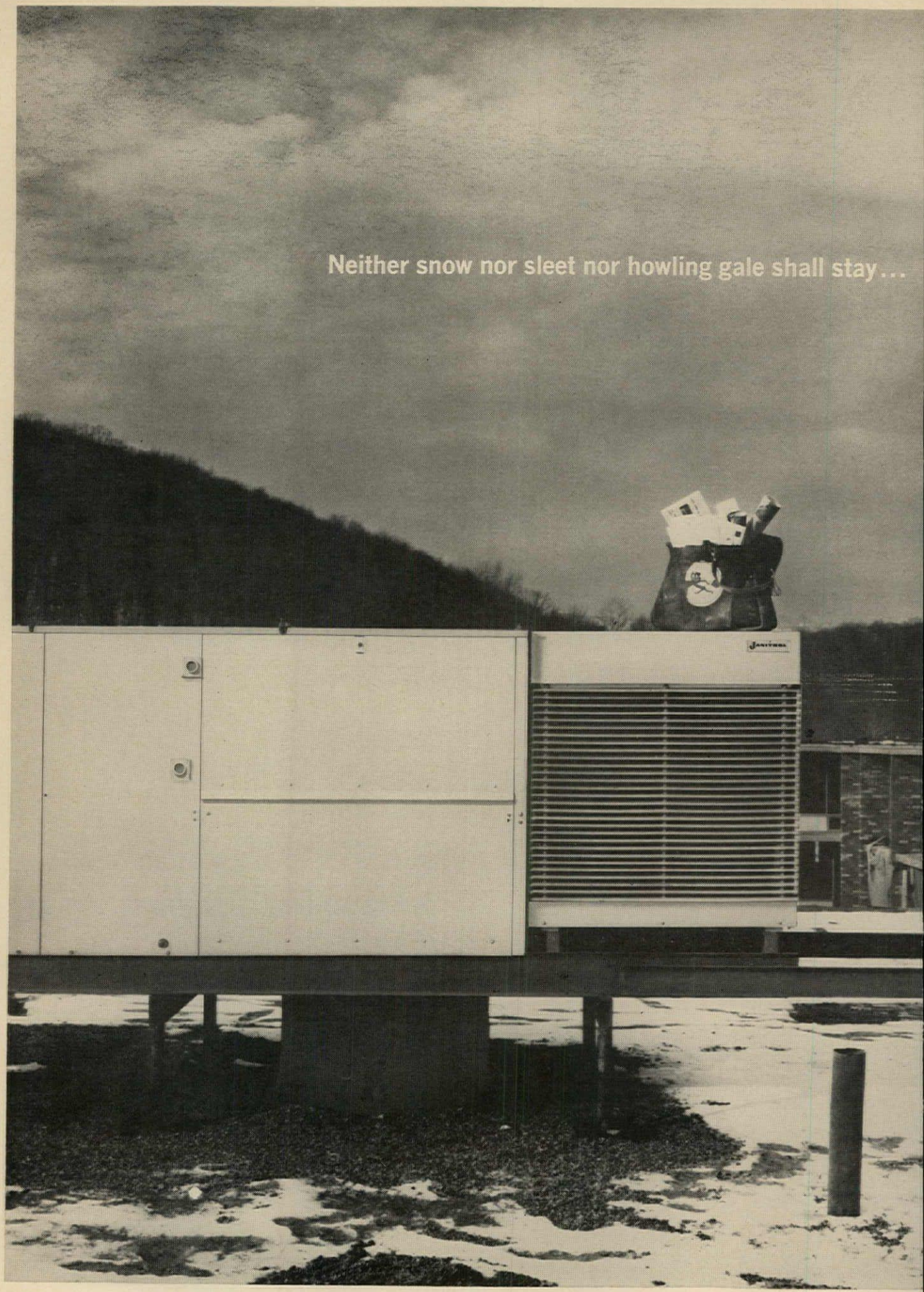
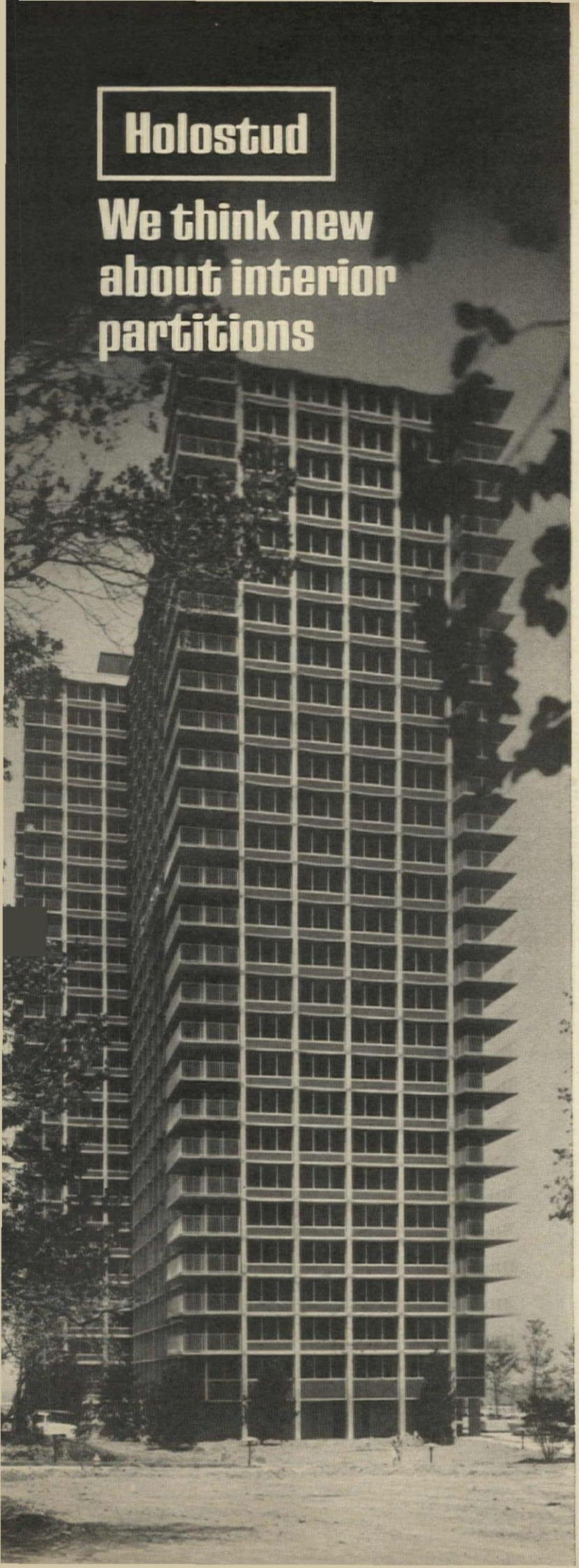

Neither snow nor sleet nor howling gale shall stay...



Winton Place, Lakewood, Ohio
Owners: George N. Seltzer and Fred Parr Cox
Architects-Engineers: Loebl, Schlossman & Bennett, Chicago
General Contractor: J. W. Snyder Co., Chicago
Plastering Contractor: Smallwood Plastering Co., Cleveland

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TWO NEW STUDIES ISSUED IN GSA HISTORICAL SERIES

The General Services Administration, Washington, D. C., has issued two more historical studies in a proposed series about public buildings of historical and architectural significance in the Washington area.

The two new titles are: "Historical Study No. 2, Agriculture—Administration Building" and "Historical Study No. 3, Executive Office Building." The first booklet in the series was "Historical Study No. 1, Pension Building." The Superintendent of Documents, Washington, D.C., 20402, offers the series for sale at 20 cents for No. 1, 25 cents for No. 2, and 65 cents for No. 3.

The GSA has a list of 16 to 20 buildings or groups of buildings for which studies are planned. The next study will be devoted to the Treasury Department Building.

QUEENS A.I.A. GIVES AWARDS TO STUDENTS

Five students at the School of Architecture at Pratt Institute were honored as the 1965 scholarship award winners for the design of a family court building at a dinner given by the Queens, New York Chapter of the American Institute of Architects on January 13. The Queens A.I.A. initiated this scholarship award to stimulate interest in needed community architectural projects. The competition marked the inauguration of an annual event and was held this year for third-year Pratt Institute students.

Olindo Grossi, dean of the School of Architecture at Pratt, presented the following awards: First Prize ($150)—Patrick Stanigar, Flushing, New York; Second Prize ($100)—Nicholas Porcaro, Richmond Hill, New York; Third Prize ($50)—James Guerra, Hackensack, New Jersey; and Honorable Mentions ($25)—James Casker, Jamestown, New York, and Louis Keilin, Houston, Texas.

COLUMBIA HONORS VINCENT G. KLING

Vincent G. Kling, Philadelphia architect, was given the 1965 President's Alumni Award of the Columbia University Architectural Alumni Association at the school's alumni day exercises on February 12.

Mr. Kling, who is a Fellow of the American Institute of Architects has received more than 100 awards and honors for his building designs since he established his own architectural practice in Philadelphia in 1946. He is an associate of the National Academy of Design and in 1959 received the Philadelphia Arts Festival Award.

STEEL INSTITUTE HOLDS CONFERENCE

The American Institute of Steel Construction will hold its 17th Annual Symposium at Chisca Plaza, Memphis, Tennessee on April 22-23.

Architects and structural engineers will discuss such subjects as the use of computers in steel design, low cost apartment house framing, new developments in high strength bolted connections, reports on current steel research, composite design with lightweight aggregates and connections for tubular members.

Registration is $10.00 for practicing engineers, architects, educators and students; for others, it is $35.00. Further information may be obtained from A.I.S.C., 101 Park Avenue, New York, New York, 10017.

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PURPOSE of the PCI Annual Awards program is to recognize creative design using prestressed concrete.

ANY KIND OR TYPE OF STRUCTURE using prestressed concrete which was completed within the last three years, or substantially completed by May 31, 1965, within the United States, its possessions or Canada may be entered. Judgment will be based on:

Design judged most worthy as a contribution to the advancement of prestressed concrete. Originality of architectural and/or engineering design involving applications of prestressed concrete, techniques of assembly, arrangement or use. Effective employment of the properties of prestressed concrete. Aesthetic appearance where applicable. The nature of each project submitted will influence the weight given to each of these considerations.

FIRST AWARD winner will be presented with a plaque testifying to the value of his contribution. An expense paid trip for two to the PCI Annual Convention in Miami Beach, Florida, December 5 to 10, 1965, including a weekend Caribbean cruise will be provided so the winner may be recognized at Award ceremonies.

AWARD OF MERIT PLAQUES will be given other distinguished entries.

SPECIAL BRIDGE AWARD. A special award will be given for the bridge demonstrating the best application of prestressed concrete.

ELIGIBILITY. The Awards program is open to all registered architects and engineers practicing professionally in the United States, its possessions and Canada, except Directors of PCI and all Active Members and their employees.

SUBMISSION OF ENTRIES. Entries must be made by the designer of record. An entry consists of one copy of the following material pertaining to the design of the structure and shall consist of the following:

1. Proper name of entry, type of structure and location (State or Province) owners name, and the date of completion. Anonymity of entries will be preserved throughout the judging. An envelope identifying the entrant and containing appropriate additional credits will be affixed to inside back cover of the entry.
2. Concise discussion outlining all of the advantages which the contestant considers noteworthy, typed on 8½" x 11" sheets.
3. A minimum of two 8" x 10" photographs and one 35mm color slide of the completed prestressed concrete portions of the structure. Detailed photographs, perspective drawings, or large scale details if considered significant by the entrant.
4. Design computations and specifications if they show to a greater extent the design aspects of the entry.

All the above to be bound in ring or other type binder approximately 10" x 12". Entries to be received not later than June 1, 1965, at the Prestressed Concrete Institute, 205 West Wacker Drive, Chicago, Illinois 60606.

JURY OF AWARDS. Entries will be judged by the Jury of Awards composed of Max Abramovitz, FAIA, Chairman; Arthur G. Odell, President of the American Institute of Architects; Edward D. Dart, AIA, architect practicing in Chicago; Murray A. Wilson, past President of the National Society of Professional Engineers; and Wallace L. Chadwick, President of the American Society of Civil Engineers.

NOTIFICATION OF AWARD. Notification of Awards to entrants will be made as soon as practicable after judging is completed.

OWNERSHIP AND PUBLICATION OF ENTRIES. All entries and all material submitted with entries shall become the sole property of PCI.

Since one of the purposes of the PCI Awards program is to encourage new and advanced architectural and engineering approaches in the use of prestressed concrete, the Prestressed Concrete Institute shall have the right to make all entries and all material submitted with entries available through publication and dissemination editorially, or in advertisements in its own or other publications. This shall include the right to publish photographs and names of any and all award recipients without compensation.

The decision of the Jury of Awards shall be binding on all persons.

By taking part in the program, the contestant agrees that he or she shall have no claim against the Jury of Awards or any member thereof, or the Prestressed Concrete Institute or its individual members.

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A.I.A. NAMES EXECUTIVES

Four men have been appointed to executive positions on the headquarters staff of the American Institute of Architects in Washington, D.C. Raymond L. Gaio has been named Director of State and Chapter Affairs; Richard S. Stitt will become Director of Information Services; Richard R. Whitaker Jr. will become Director of Educational Programs; and Neil E. Gallagher has been named Assistant Director of Information Services.

Mr. Gaio, from Washington, D.C., fills a new post created to expand the coordination of activities performed by the Institute's 155 chapters and state organizations throughout the nation. The new Director of State and Chapter affairs is an architectural graduate of the University of Notre Dame and has worked for The Perkins and Will Partnership, Washington, D.C.; Leo A. Daly Company, Omaha, Nebraska; and Spangler, Beall, Salogga & Bradley, Decatur, Illinois.

Mr. Stitt, from McLean, Virginia, succeeds James Bailey as Director of Information Services. Mr. Bailey will become a senior editor of Architectural Forum. Mr. Stitt comes to the A.I.A. after serving two years on the Peace Corps staff as director of the campus relations division of the office of public affairs. He also served as a contributing editor of Arizona Architect magazine.

Mr. Whitaker, from Berkeley, California, the new Director of Educational Programs, succeeds Maurice William Perreault, who has joined the staff of the Perkins and Will Partnership, Washington, D.C. One of his major duties will be to work with the National Committee on Education in a newly established project designed to seek and implement better methods of educating architects and others involved in the design of man's physical environment. Mr. Whitaker served on the faculty of the University of California department of architecture from 1962 until the present, and he has been a partner in the firm of Moore, Lyndon, Turnball and Whitaker since 1962.

Mr. Gallagher, of Kendall Park, New Jersey, fills a post created to expand information on the Institute's national "War on Community Ugliness." The new Assistant Director of Information Services was for nine years a reporter on The Home News, New Brunswick, New Jersey, where he specialized in coverage of municipal government activities, urban renewal, planning offices and architecture.

Raymond L. Gaio

Richard S. Stitt

Richard R. Whitaker Jr.

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Construction Details on
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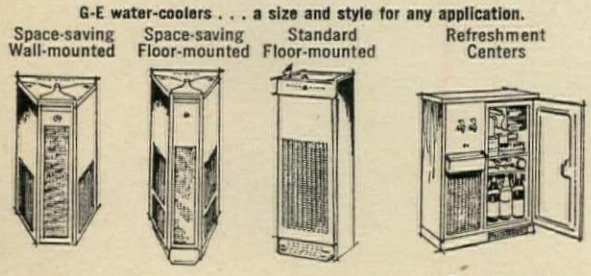

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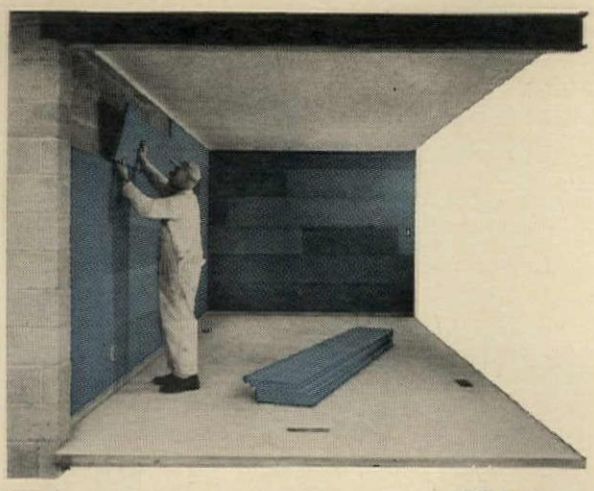

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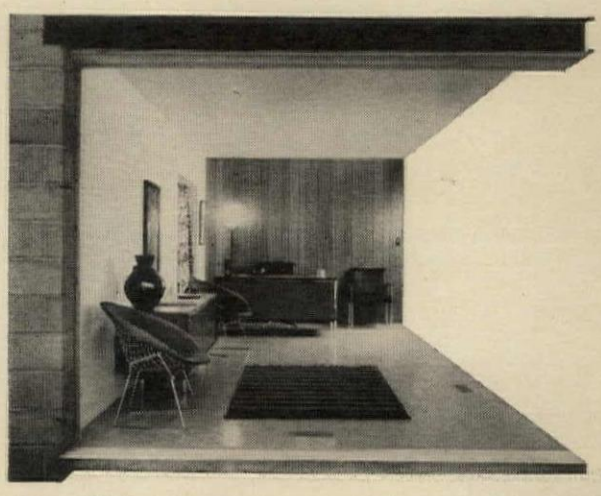

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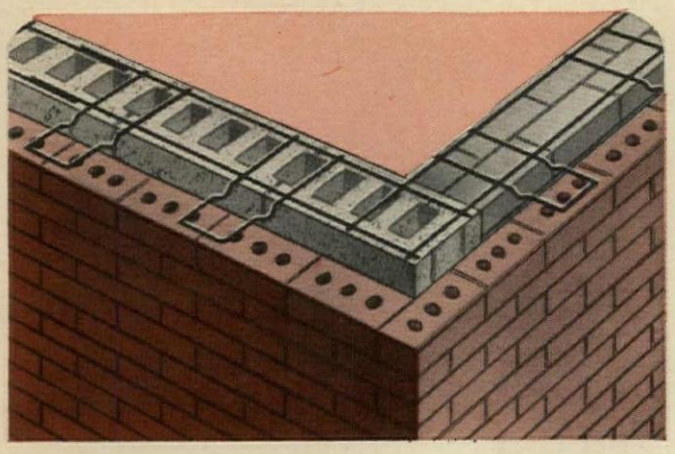

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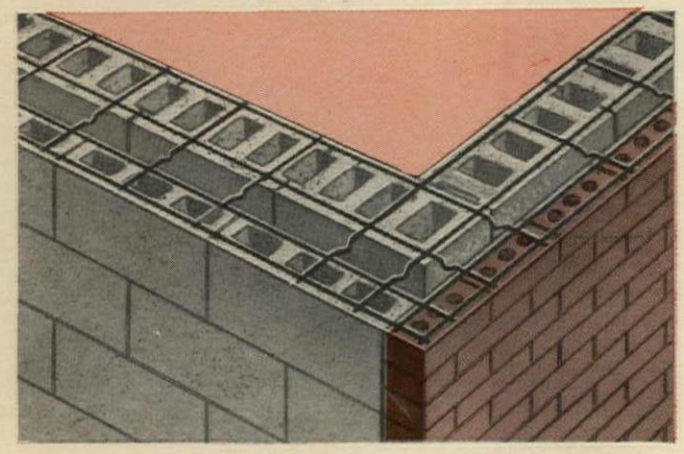

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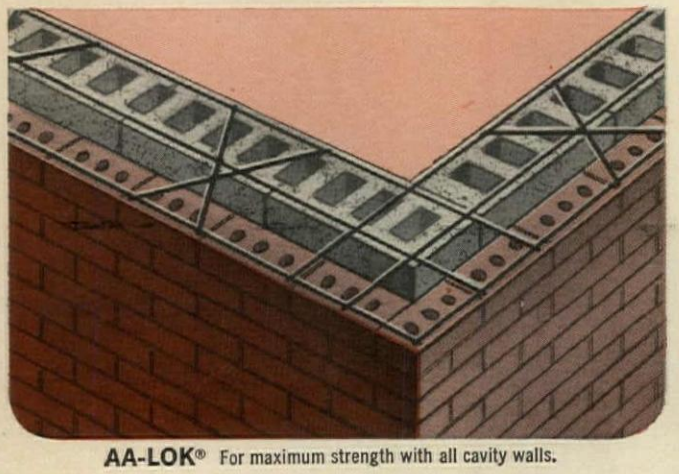

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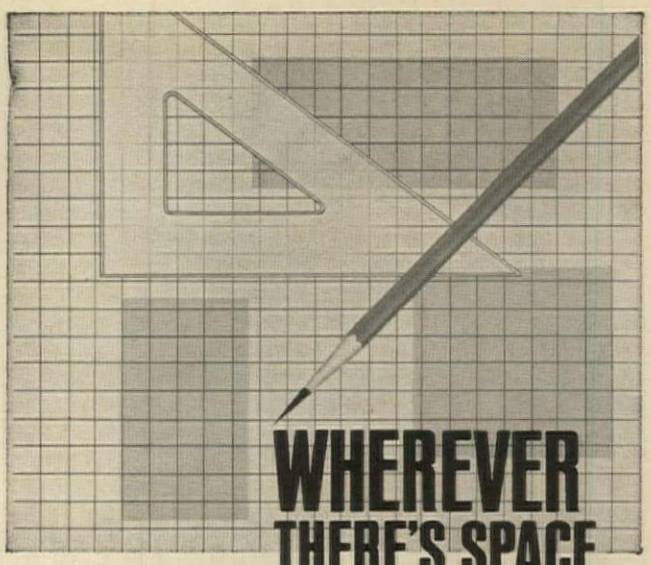

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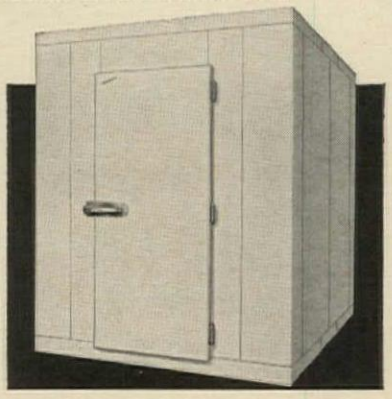

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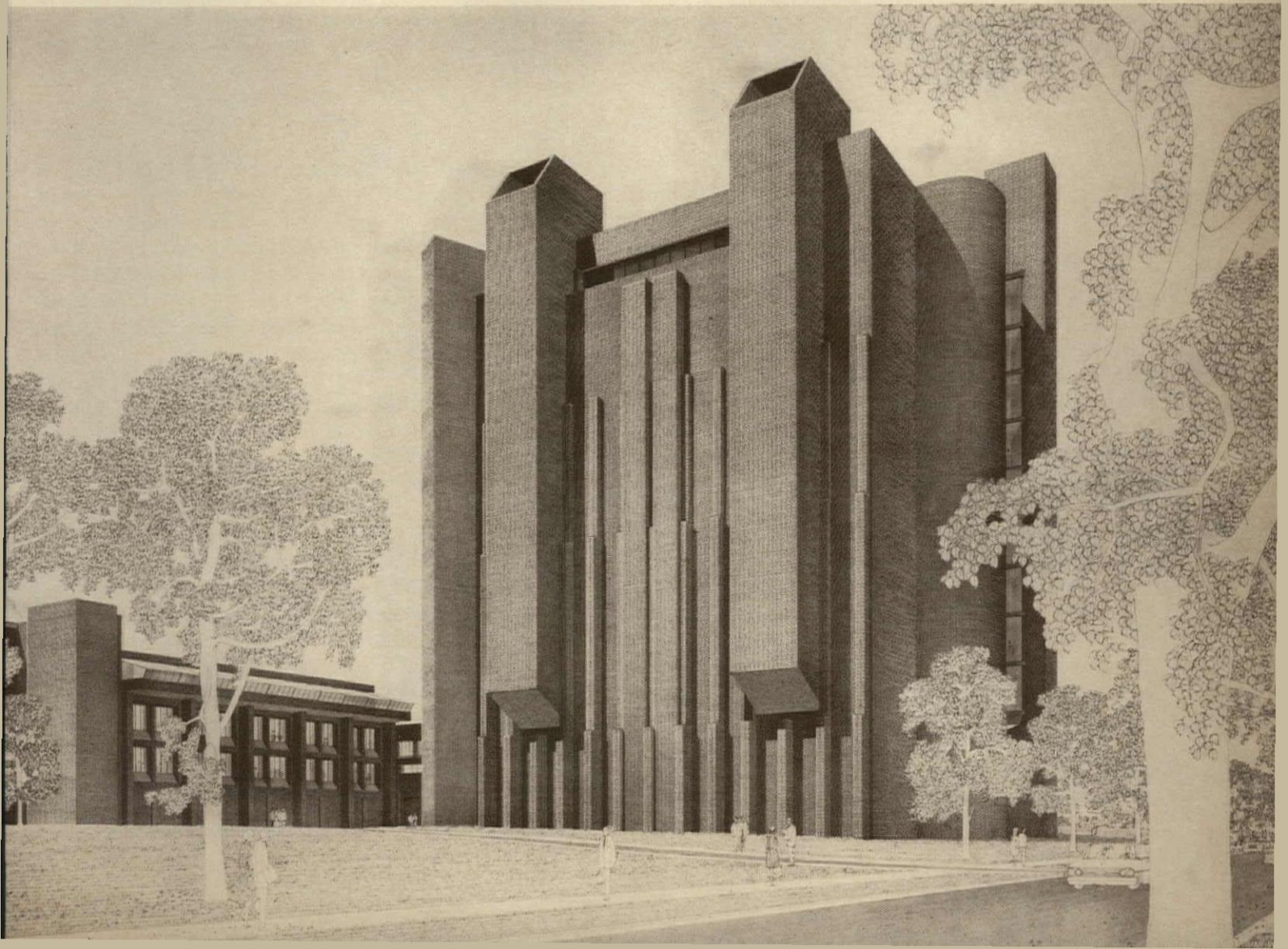
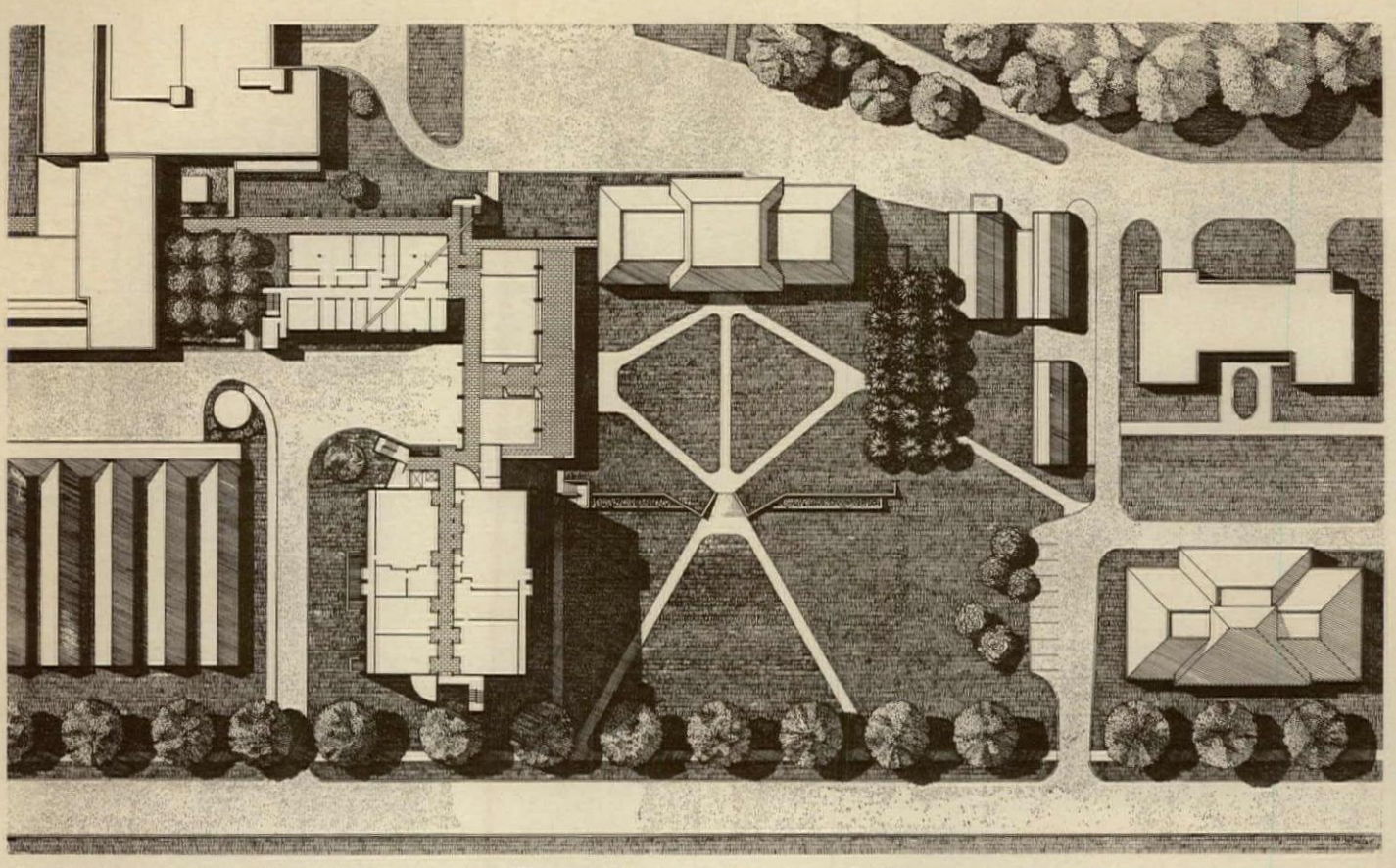
A NEW ARCHITECTURE FOR THE RESEARCH LABORATORY

The towers and turrets of what appears to be a medieval brick fortress shown in the drawing below are in reality service shafts for well articulated functional systems assembled in a deft vertical composition which imposes a new and highly developed conceptual order on the elements of a modern laboratory. In this design for the projected Agronomy Building for the New York State College of Agriculture at Cornell by Ulrich Franzen, two of the shafts serve the heating, ventilating and air-conditioning system with fresh air drawn in at the ground level. This air is uncontaminated by the foul air which is discharged skyward by four great snorkels, two on each side of the building. Two large shafts at the north and south ends are stair towers, and the widest of what appear to be rather flat buttresses on the east and west facades actually contain chases for plumbing and electrical risers. The rest of these narrow vertical elements are masonry piers that increase in area as the load collects toward the ground. Window bays at the end of the central corridor on each floor are referred to by Franzen as oriels, a bit of poetic license appropriate to the medieval image of this brilliantly modern building.

Helmut Jacoby

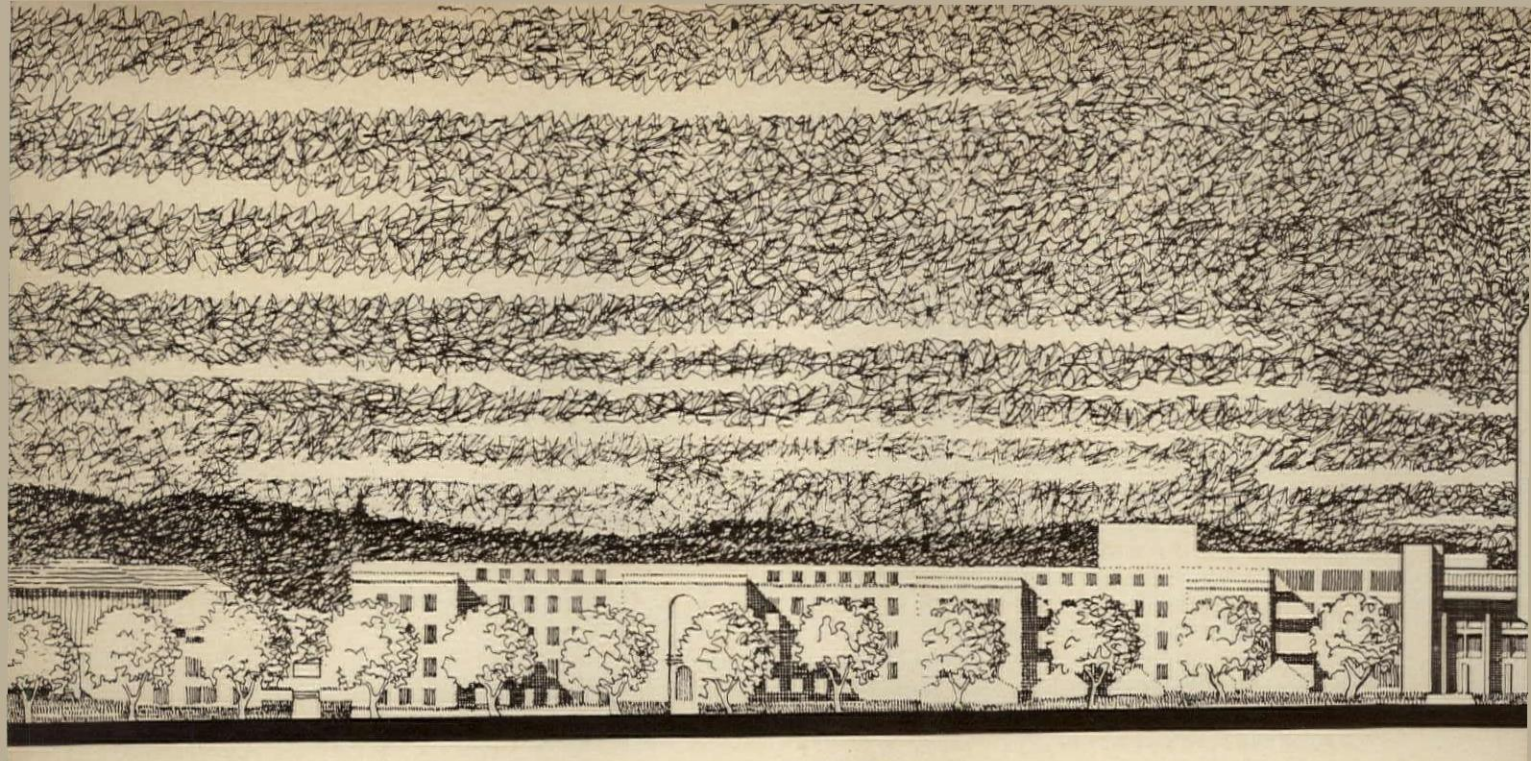




In the site plan (*above*), north is at the top. The new structure will be bordered by a group of existing academic buildings; the agricultural library on the northwest and the plant sciences hall on the west, both of which front on the Agricultural quadrangle shown on the northwest corner of the drawing. To the southwest are eight greenhouses. The conservation department building crowns a gentle slope on the northeast. The program required that it be connected to the new Agronomy Building. The major pedestrian access to the site will be from the northwest through an outdoor passage leading from the agricultural quadrangle through the herbarium wing of the plant sciences hall to the terrace of the new building

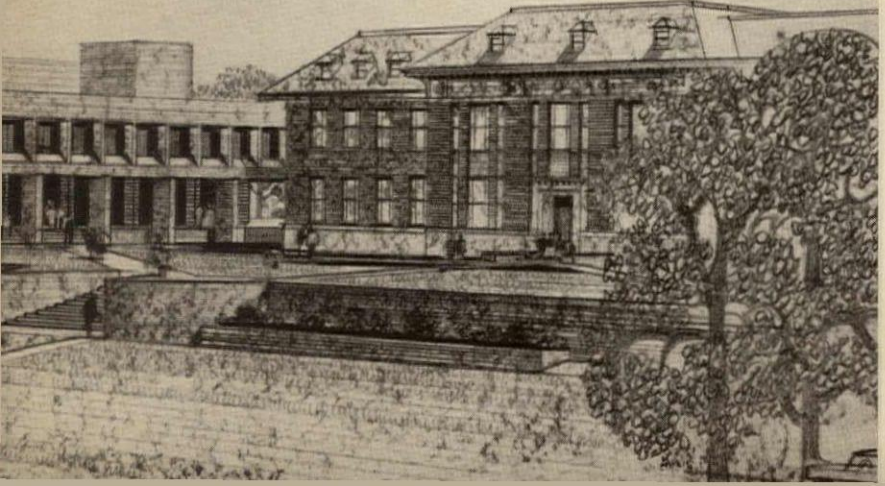
Ulrich Franzen's design for the new Agronomy Building at Cornell suggests as its obvious prototype Louis Kahn's Alfred Newton Richards Medical Research Building for the University of Pennsylvania completed in 1961. Both buildings carefully articulate both "served" and "servant" spaces, and in both structures major "servant" spaces form great towers of brick reminiscent of Kahn's beloved Albi, Carcassonne and San Gimignano. Franzen points out, however, that the Agronomy Building is completely different from the University of Pennsylvania laboratories in its organization of service elements and in its structural system. According to Franzen the building at Penn can best be regarded as a prototype not only for the Cornell design but for much contemporary work, in the sense in which Kahn's structure expresses the latter's concern with vertical composition. Until recently most practitioners were still influenced by the International Style and were accustomed even when designing skyscrapers to organize form in interpenetrating horizontal elements. Franzen believes that Kahn to his great credit has reminded architects of the strong and evocative potential inherent in vertical massing.

Franzen has achieved an architectural strength and assertiveness in his design for the Agronomy Building which he believes is called for. The New York State College of Agriculture at Cornell to which the existing agriculture quadrangle and the proposed new tower belong is a college of the State University of New York rather than Cornell University. Tuitions reflect the difference between the privately endowed and state supported educational facilities, and the faculties and student bodies of each institution are distinct and separate. So are their campuses. The State University Campus at Cornell occupies what is known as the "upper campus"; Cornell University occupies the handsome "lower campus" to which has been added several excellent new multi-story buildings in the last few years. The "upper campus" has an institutional importance which is not expressed in its uniformly low and modest architecture which is rather enhanced by the drawings (*opposite page*). For Franzen, his research tower not only makes sense as a system of organization for laboratories in the science of field crop production and soil management, but it is the ideal site solution, announcing and asserting the presence of another campus as it punctuates the horizon with its vertical masses.

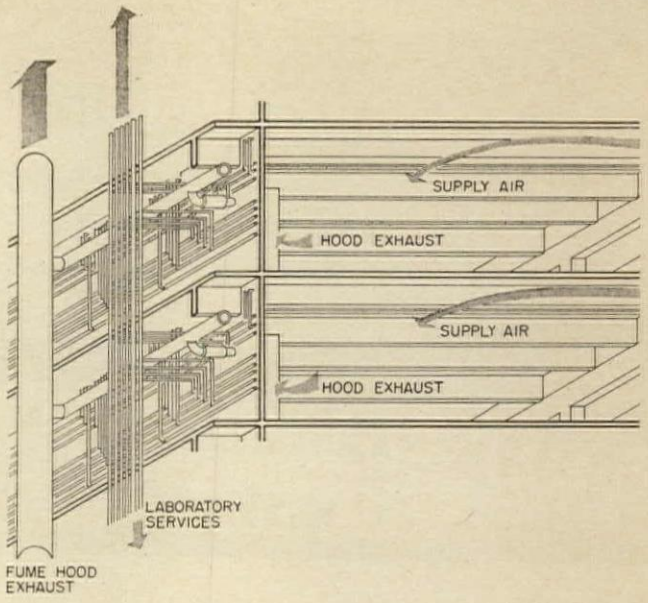


Helmut Jacoby

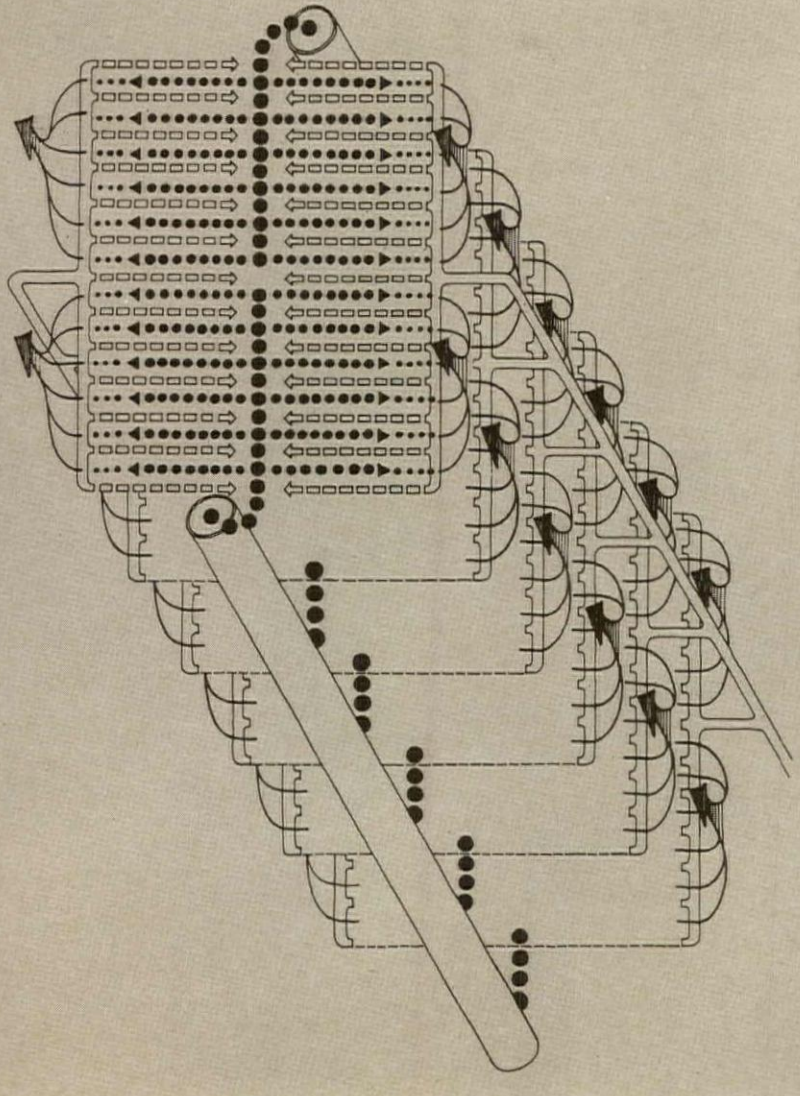
A row of 50-foot oaks borders the street shown in the elevation (*above*). The vertical mass of the Agronomy Building will tower over the trees and the open expanse of the athletic fields beyond, accenting the three- and four-story campus buildings with its height and vigorous profile

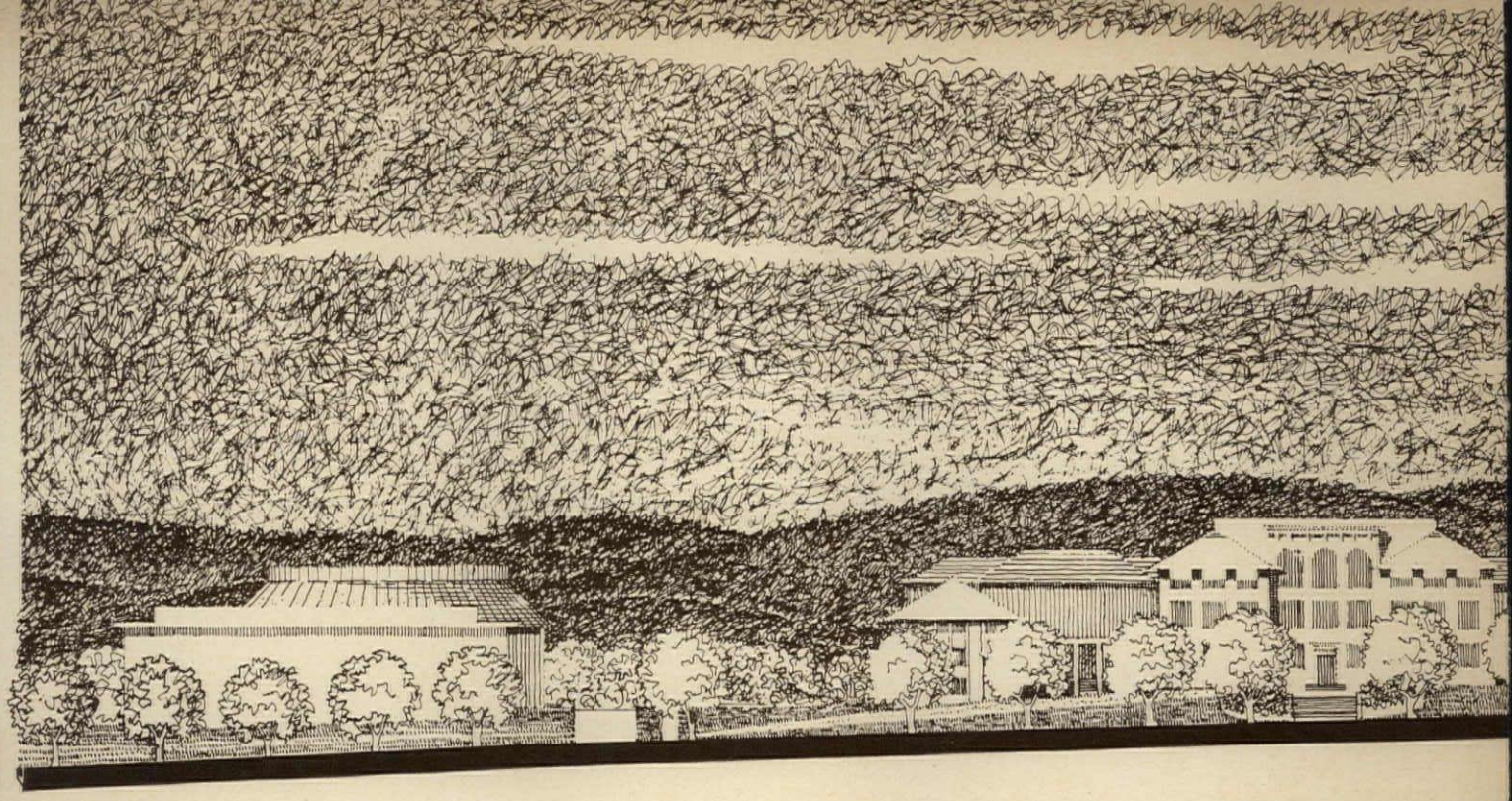


All working spaces in the 13-story research tower are windowless to promote a completely controlled environment for research activities, except for the 11th floor meteorology section which requires proximity to rooftop weather recording devices, and windows for weather observations. This department enjoys the penthouse location and windowed galleries on the east and west. The low wing accommodates administrative units, teaching laboratories and solaria, multi-purpose units and mammal, bird and reptile collections. Surfaces of both the tower and the low wing will be of brick which according to Franzen "introduces the virtues of a limiting scale making a form explicit"



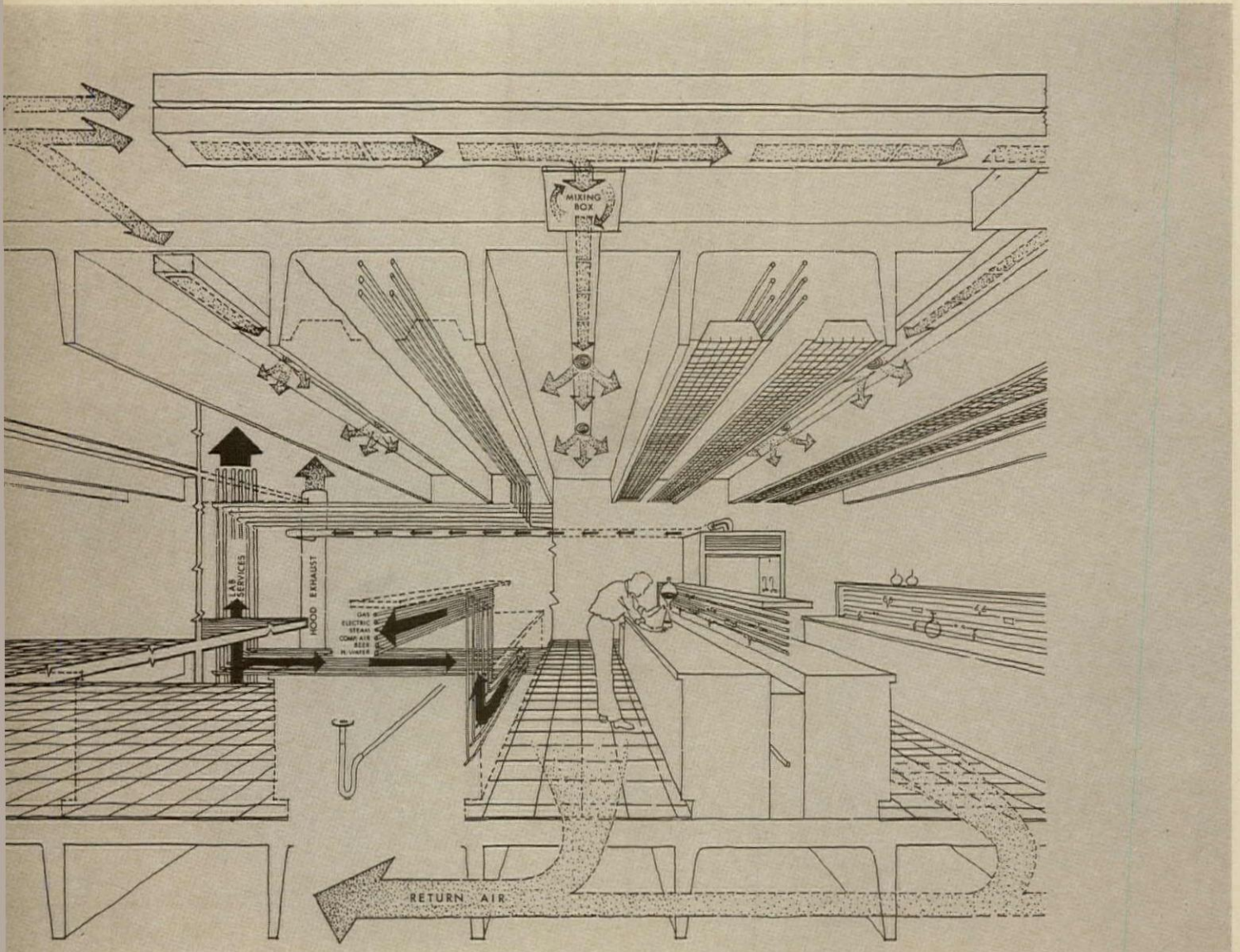
In the diagram (*below*) the large black dots indicate the separation and direction of conditioned air supply arriving from shafts at the north and south and handled at the ceiling, from the paths taken by the pressure services, the acid waste pipes and the electricity supply which arrive at alternate points of the module through the floor. This route is indicated by the broken lines which connect to the supply shafts to the east and west. Contaminated air is exhausted by means of fume hoods located in the air supply module which connect to ducts which lead to individual fans at the top of each of the four great exhaust shafts on the east and west. This path is indicated by the small black dots which collect at the vertical arrows

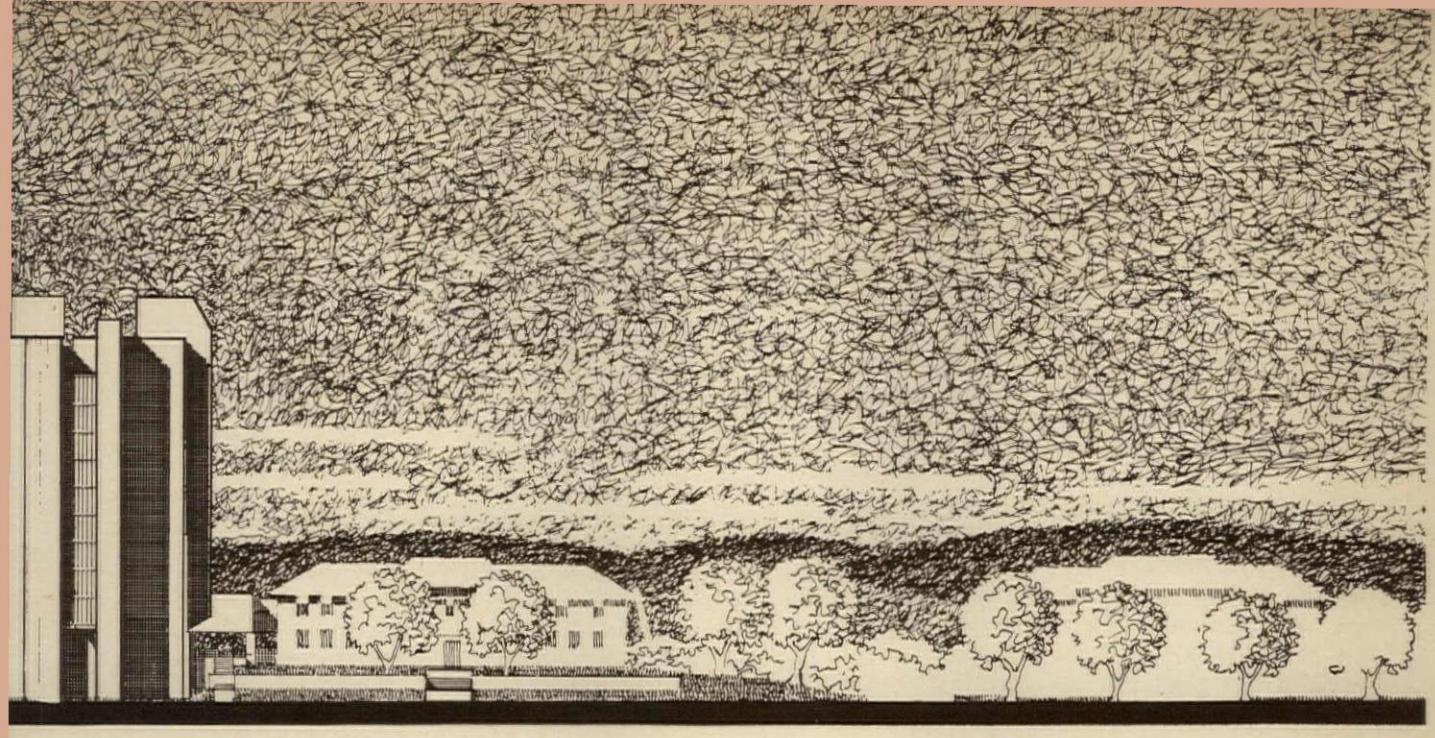




Laboratory spaces as they would appear if the adjacent wall of the central corridor were removed. The wall separating the laboratory space from the distribution corridor has been partially cut away to show the organization of vertical risers and horizontal feed lines for the pressure services, electrical distribution and acid wastes. The connection from each fume hood to its individual exhaust stack is shown as well as the distribution of conditioned air from the central corridor. The horizontal runs can be repaired or replaced within each module without shutting off the whole system of services. There are no space consuming intersections or cross overs between air-handling equipment and pressure services

CLIENT: *New York State Construction Fund*
ARCHITECTS: *Ulrich Franzen & Associates*
MECHANICAL ENGINEERS: *Cosentini & Associates*
STRUCTURAL ENGINEERS: *Weiskopf & Pickworth*





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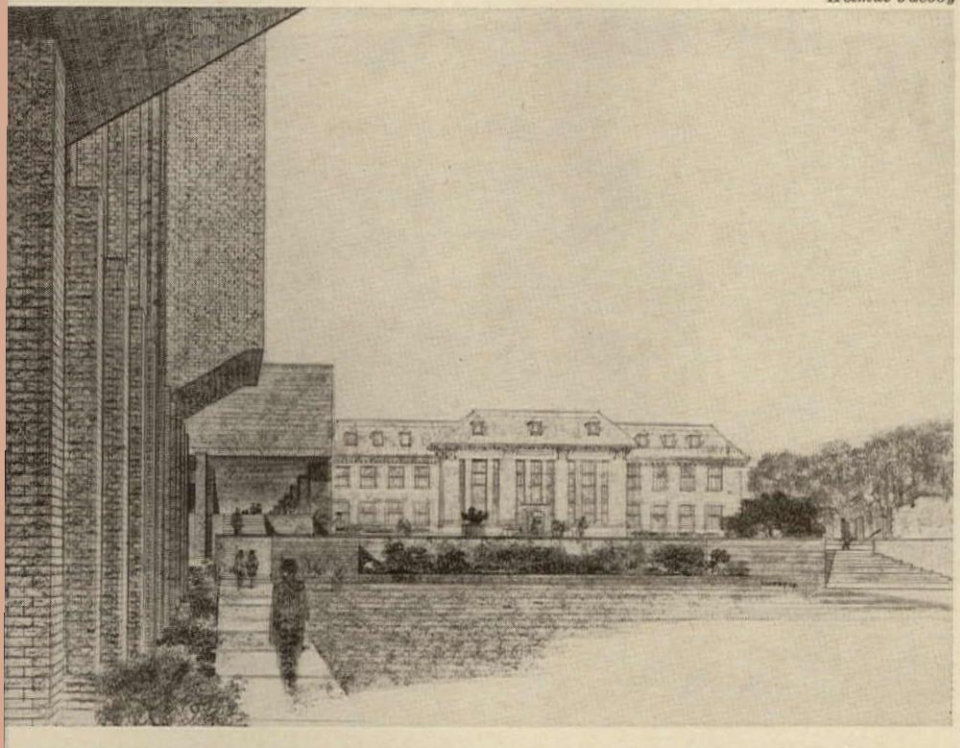
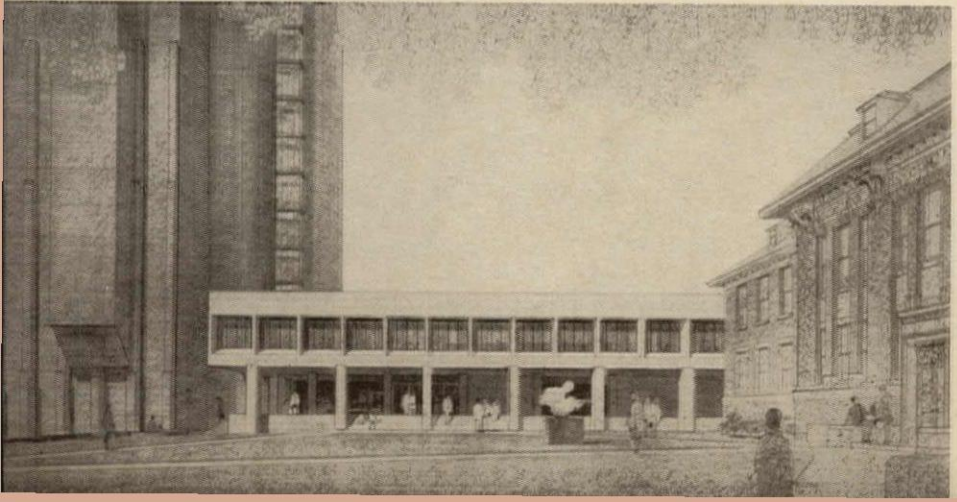


A 6-foot retaining wall defines a high entrance plaza in front of the conservation department building increasing its dignity and accessibility. This skillful handling of the slope provides a well differentiated entrance to the Agronomy Building from the lower plaza, and the change in level also aids in making a transition between the massiveness of the proposed research tower and the smaller scale of the upper plaza



The classic front elevation of the conservation department building facing the street receives deference from the administration wing of the Agronomy Building which flanks it. The second floor parapet of this unit which shelters the building's entrance arcade, relates to the classic cornice and establishes a unifying horizontal. The spacing of its deeply recessed fenestration corresponds to the spacing of the conservation department building's windows

Heating, Ventilating and Air Conditioning

The research tower of the building is completely air conditioned. Due to the nature of the contaminants generated within the laboratory spaces, the building works on 100 per cent outside air with all air being exhausted either through hood exhaust fans or general exhaust systems.

Since all fresh air is drawn in at the bottom of the building and all contaminants and exhausts are discharged at the top, there is a minimal hazard of cross-contamination.

A dual duct high velocity system served from two separate rigs in the basement rises in air delivery shafts at the north and south ends of the tower. The ceiling of the central corridor on each floor is used for distribution with high velocity ductwork and mixing boxes located therein. Low pressure duct discharge runouts from all the high pressure boxes to the offices and laboratories are recessed within the depth of beams spanning the spaces, on a modular basis. Individual zone temperature is maintained by means of thermostatic control of mixing boxes.

Each hood exhaust duct is carried separately to the nearest fume exhaust shaft and up to an individual exhaust fan space at the top of the shaft. In this way noncompatible fumes are not mixed.

Electrical

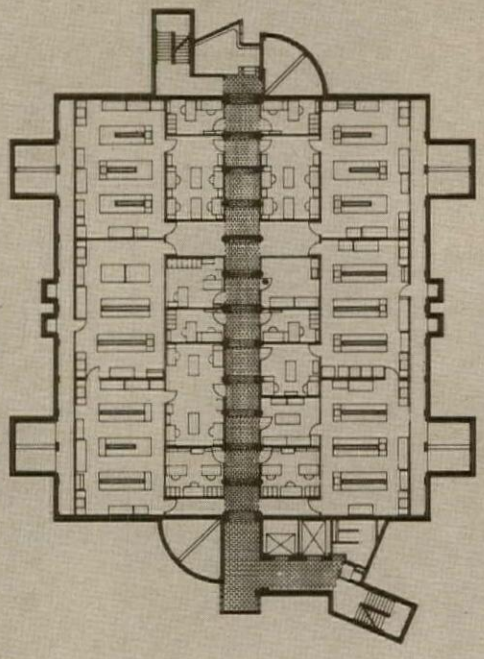
Each half of the research tower is served by a spine of electrical bus duct which rises in an electrical shaft on the east and west walls. This power is distributed laterally along the distribution corridor.

Each laboratory module will be supplied with appliance power through underfloor distribution conduits, recessed within the beam depth and coming up through knockout openings in the floor as required. Lighting circuits will run out in the same space, serving the lighting units for the floor below.

Plumbing

All laboratory services piping runs out to laboratory benches, through the underfloor plumbing module recessed in the depth of the floor structure and up through knockout holes to the bench. All pressure services come from the distribution corridor.

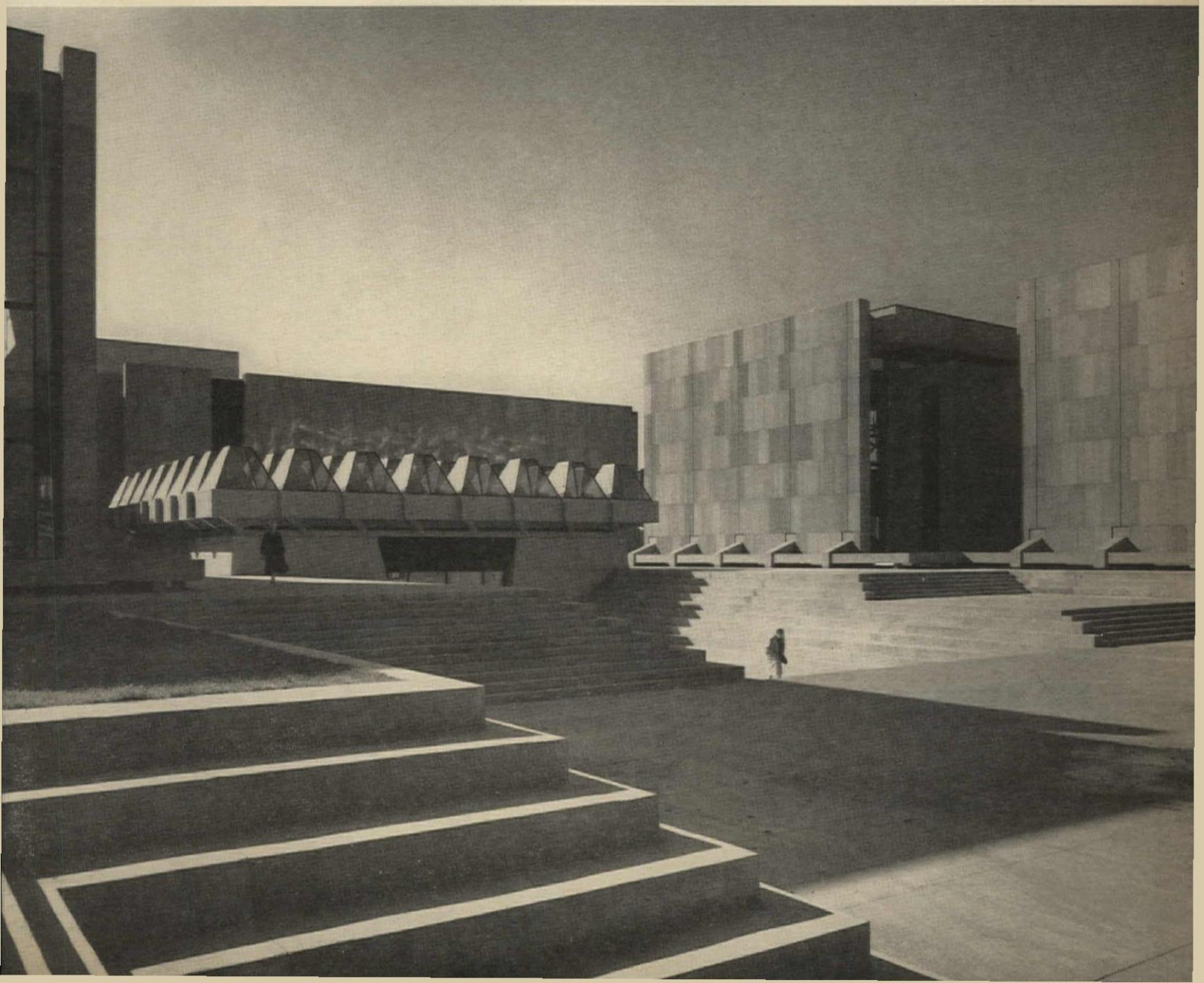
Each research floor is organized around a central corridor, running north and south from an oriel window at the elevator lobby to an all glass faculty lounge facing south. Research spaces, planned around an 8-foot 6-inch laboratory services distribution module, extend 36 feet on either side of the center corridor to a 4-foot mechanical distribution corridor running along the east and west facades of the research tower. Offices and workrooms are generally located along the center corridor with laboratories on the outside wall. Laboratories can extend the entire depth, however, since services are available for 36 feet

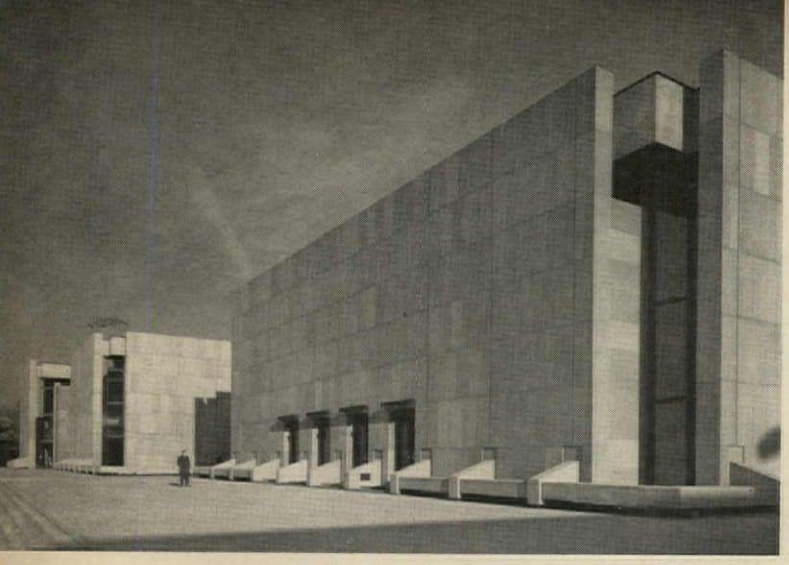


Monumental Civic Architecture, Modest in Scale

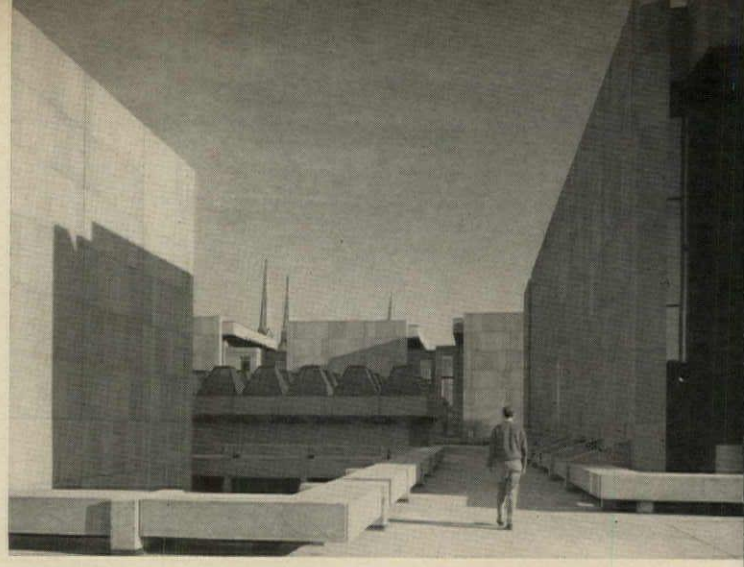
Although it may seem a contradiction in terms and therefore impossible to achieve, the architects of the recently completed Fathers of Confederation Memorial, a culture center commemorating Canada's Confederation, have assembled a memorial hall, libraries, a museum, an art gallery and a theater on a relatively confined site in a manner carefully designed to maintain the scale of early 19th-century Charlottetown on Prince Edward Island in the Canadian Maritime Provinces

H. R. Jowett photos

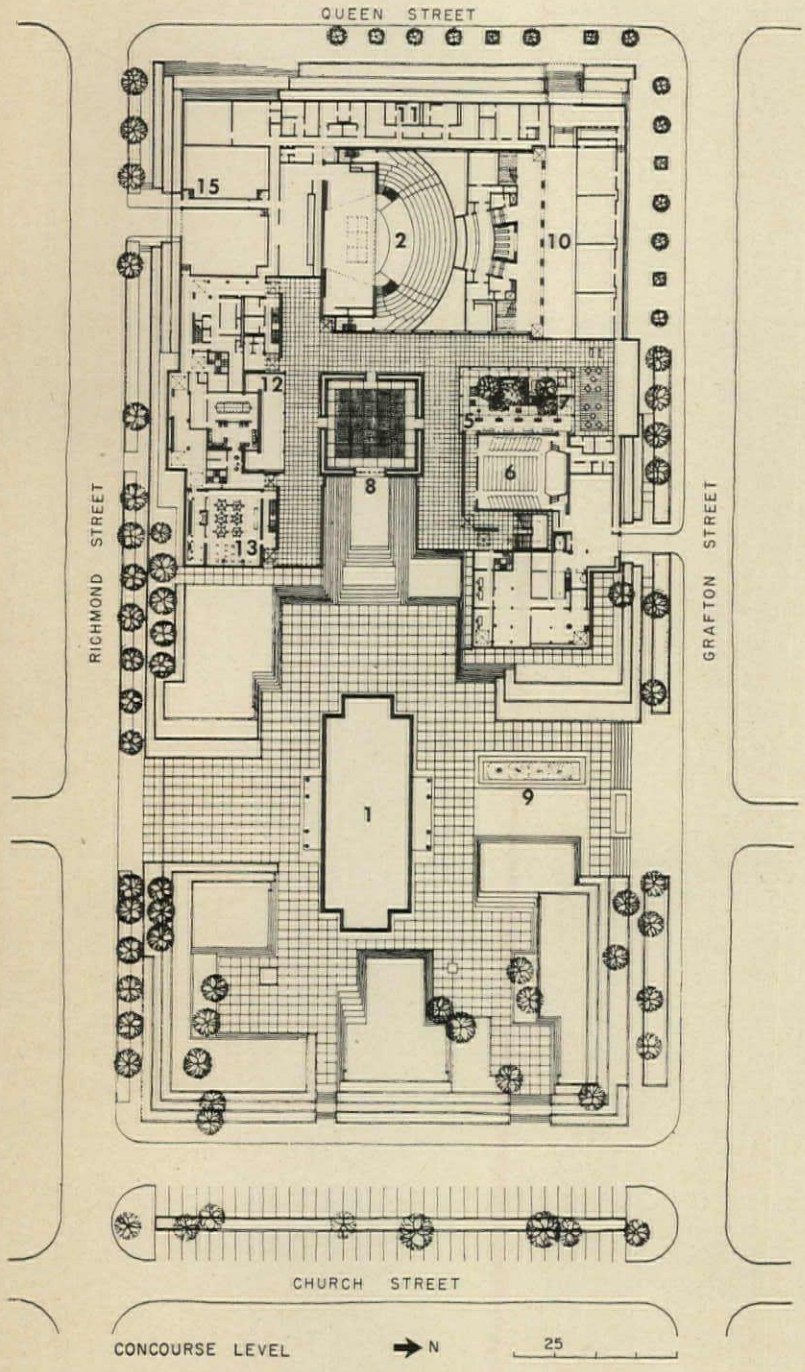


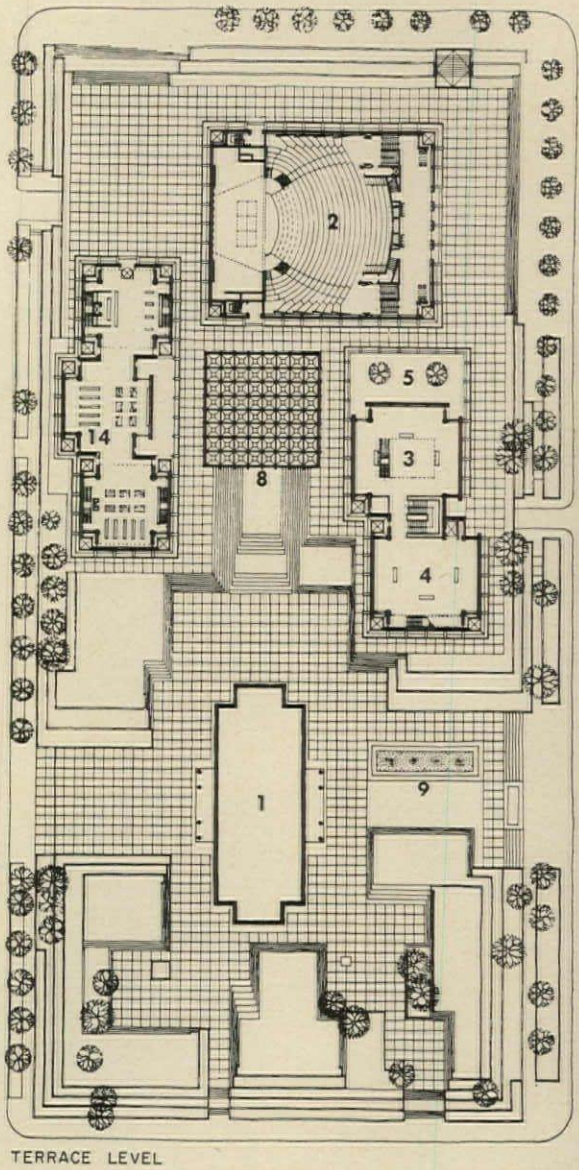


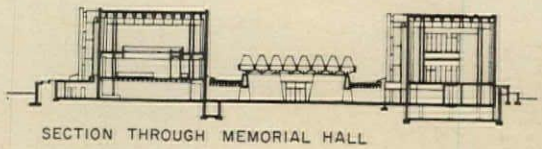
Theater entrance wall, art gallery and museum beyond



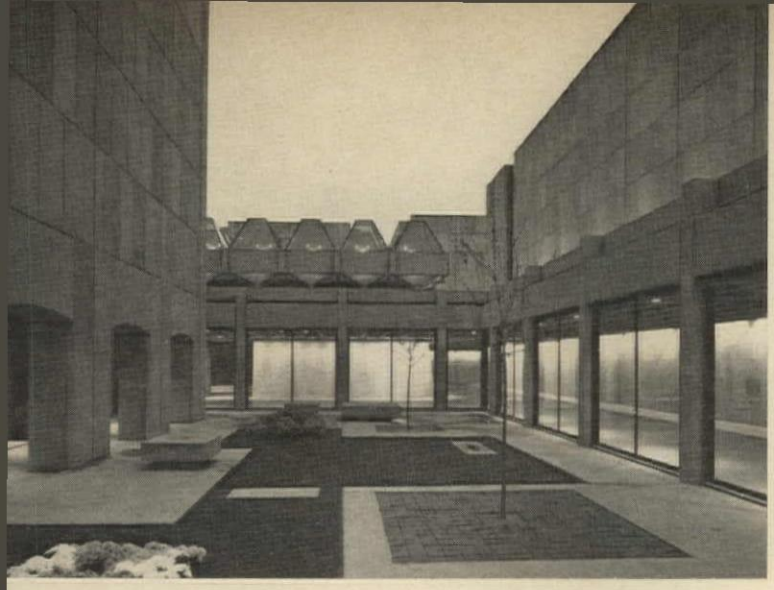
Looking south toward memorial hall and library







1. Provincial Building, 1847
2. 1,000-seat theater
3. Art gallery
4. Museum
5. Sculpture court
6. Lecture theater
7. Restaurant
8. Memorial hall
9. Fountain
10. Lower theater lounge
11. Dressing rooms
12. Library sculpture court
13. Children's library
14. Main reading room
15. Rehearsal room

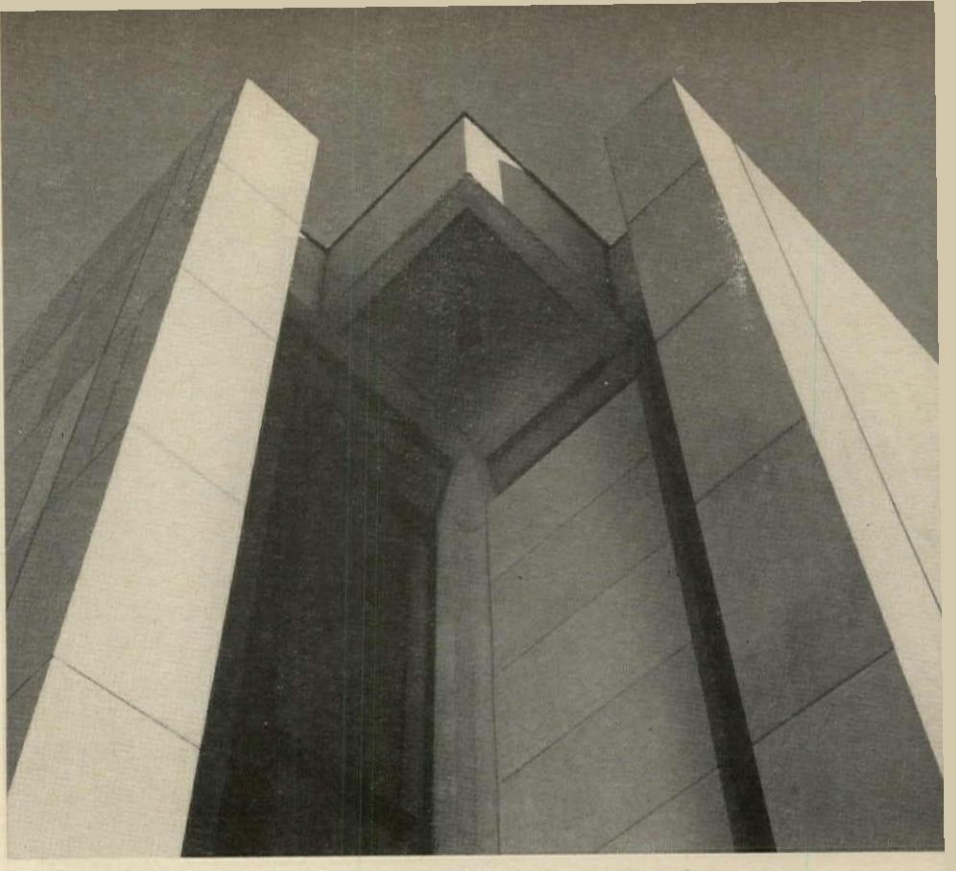


Sculpture court at concourse level as it appears from restaurant

Memorial hall serves as main entrance to complex

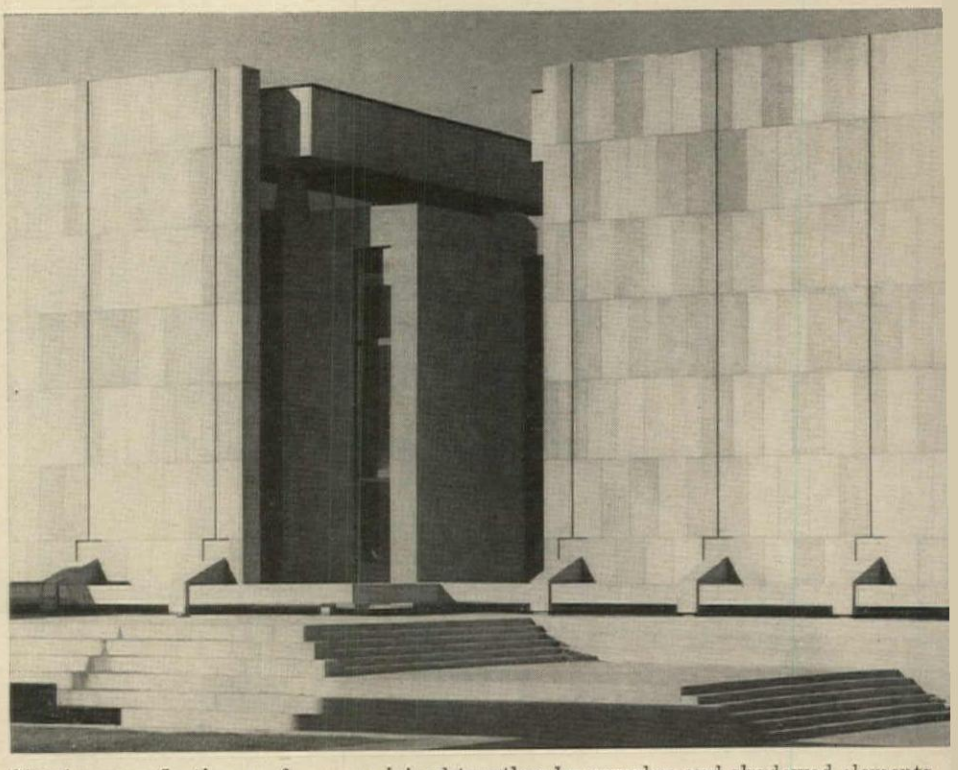
ARCHITECTS: *Affleck, Desbarats, Dimakopoulos, Lebensold, Sise; partner-in-charge: D. Dimakopoulos; project manager: H. K. Stenman; design development: Vincent Chan*
TOWN PLANNER: *Norbert Schoenauer*
STRUCTURAL ENGINEERING CONSULTANTS: *Adjeleian & Associates*
MECHANICAL AND ELECTRICAL ENGINEERING CONSULTANTS: *Jas. P. Keith & Associates*
THEATER CONSULTANT: *George Izenour*
ACOUSTICAL CONSULTANT: *Bolt, Beranek & Newman, Inc.*
LIGHTING CONSULTANT: *William M. C. Lam*
CONCRETE CONSULTANT: *Edward Friedman*
GENERAL CONTRACTOR: *Pigott Construction Co. Ltd.*

The sunken memorial hall has been placed on the longitudinal axis of the Provincial Building, a Georgian survival of 1847

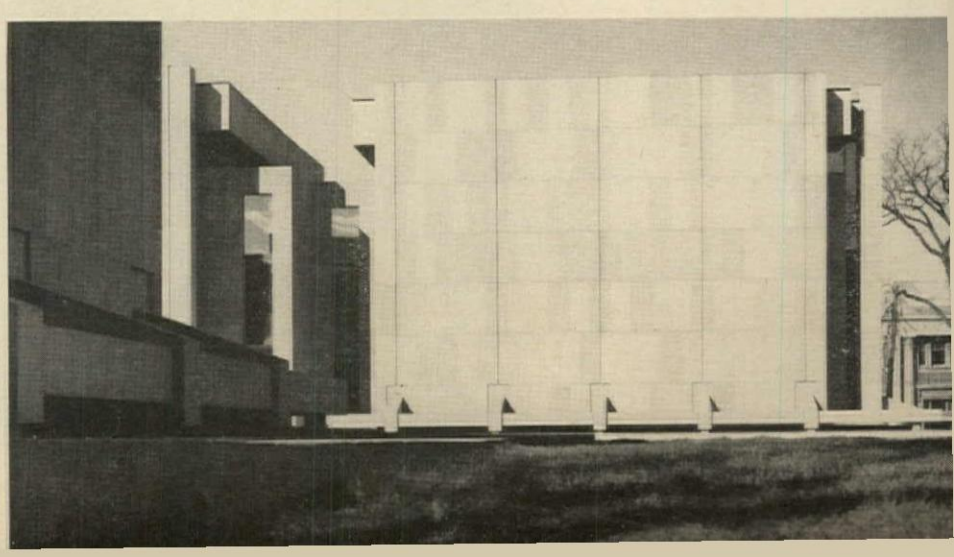


Chris F. Payne

Vertical windows at recessed corners articulate intersecting planes



Simple sun reflecting surfaces are joined together by complex and shadowed elements



A Matter of Scale

The architects were anxious not to produce a mass which would overwhelm by its size the delicate Georgian quality of the Provincial Building and the other small scale 19th-century buildings in the area. They decided to defer to the Provincial Building by articulating the main elements of the program as separate structures with proportions in harmony with the Georgian landmark. The art gallery and the museum had to be linked for administrative reasons, but they became a single bipartite building with each element clearly defined. The library was held to the desirable small scale by developing it into a tripartite form. The theater, art gallery, museum and library rise to the height of the Provincial Building for unity as well as scale.

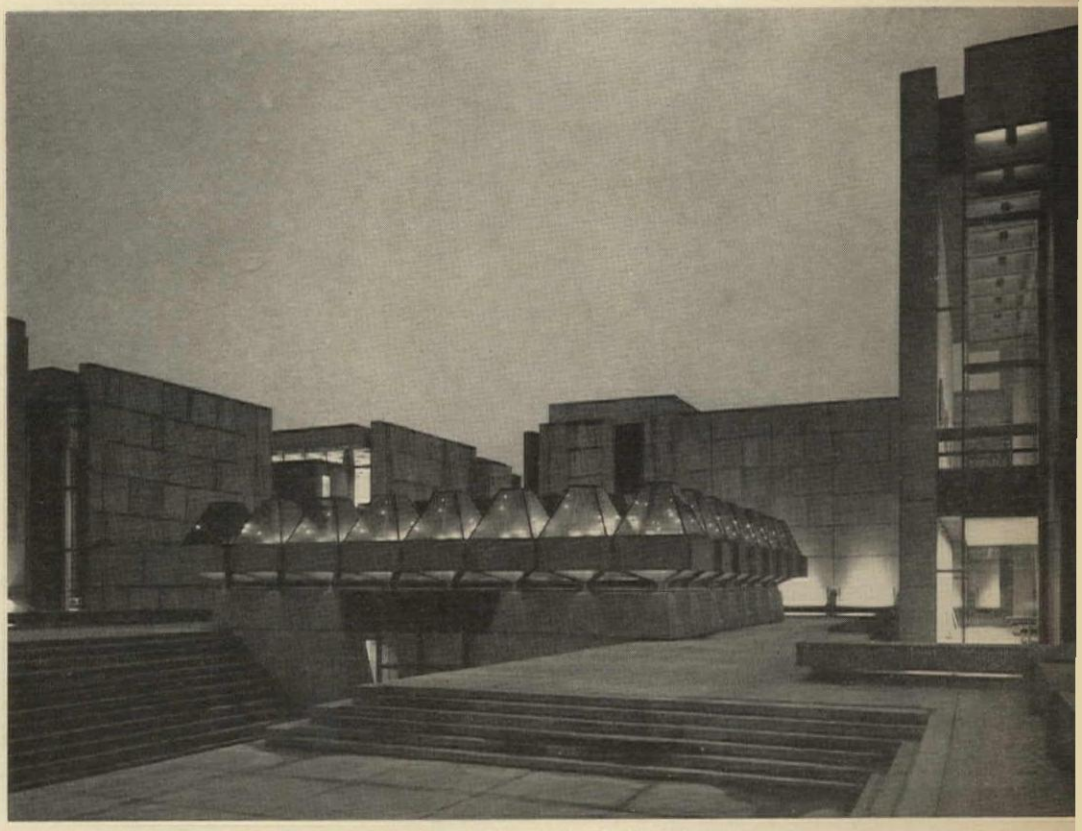
Since the main elements had to be linked under cover and since large service areas were required it was decided to place the structures on a terrace one story high with underground circulation and service rooms on the subterrace floor below grade.

The memorial hall needed to be kept low so as not to overwhelm the rather confined space which surrounds it at the terrace level.

A design vocabulary was developed which consists of vertical unbroken planes separated by thin vertical windows in recessed corners and at the conjunction of the bipartite and tripartite elements.

Mass, Structure and Light

In his lighting design, consultant William M. C. Lam strongly reinforces the simple and monumental architectural statements which have been achieved for this culture center. He interprets the basic architectural concept as one in which the building masses rise from the all important concourse level which, due to the cold climate, replaces the terrace as the major circulation path for much of the year. As Lam points out and as the photographs on the opposite page clearly show, in daylight and especially in sunlight the organization of masses is bold and articulate as seen from the terrace level. Lam believes that the architects have handled daylight superbly at the concourse level as well. The heavy stone railings which surround each element at the terrace level creating a strong visual base actually protect narrow skylights which admit light to the concourse while defining the continuity of the wall plane from concourse floor to skyline. The effect is not only handsome within the concourse, but it defines the bi-level circulation system and provides a more complete sense of orientation for users of the concourse. Lam's supplementary daytime illumination is designed to augment areas with insufficient daylight, without negating the effect of daylighted walls, open courts and the toplighted memorial hall. At night incandescent lamps within the skylights illuminate the walls above and the terrace below.



The design solution for night lighting reverses the daylight effect

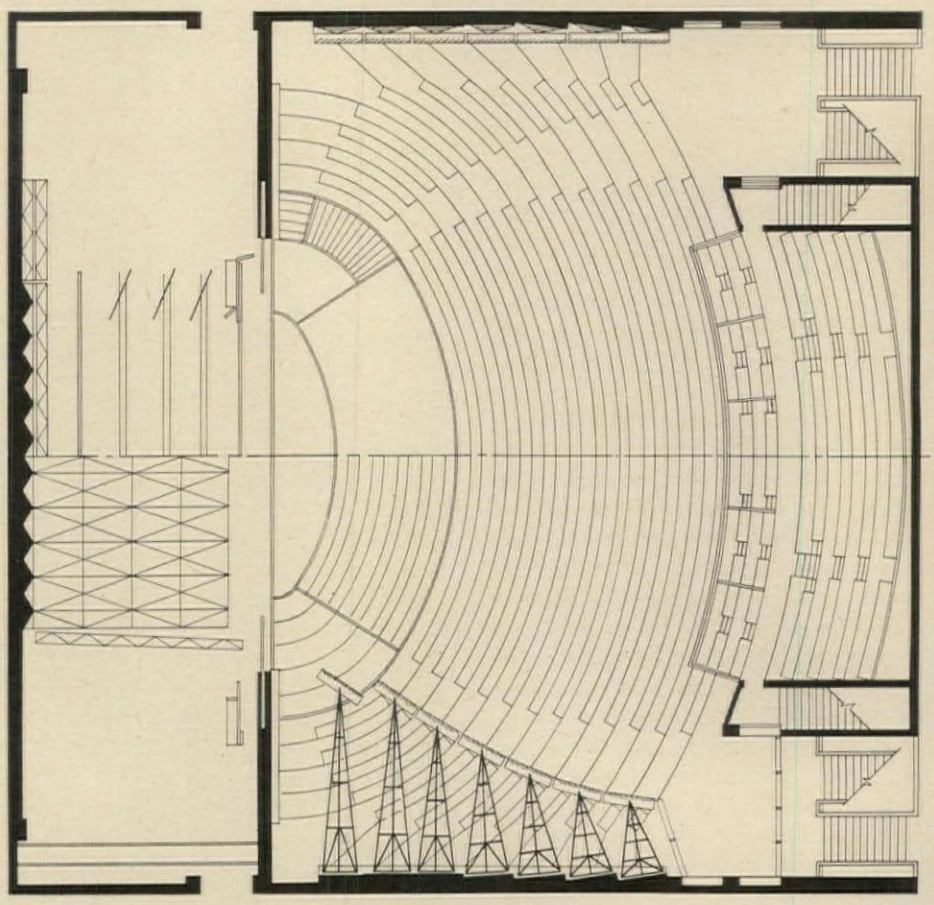
Winch Driven Vertical Panels Give Theater Two Basic Shapes

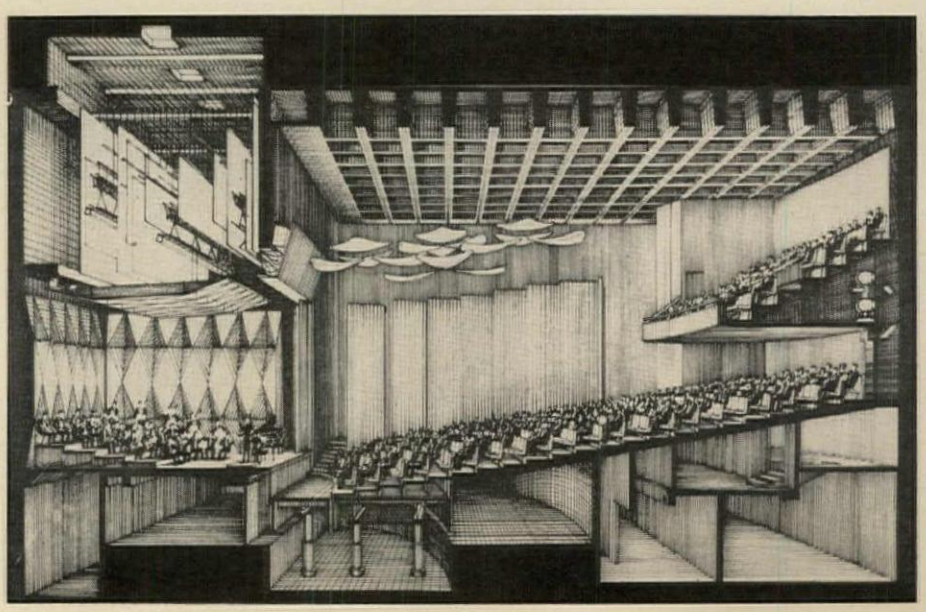
The theater can be converted from the proscenium form to the extended apron or classical form. In the combined half plans (*right*) the apron stage is shown above the centerline and the proscenium stage below. The apron stage requires that seats surround it as shown, but these seats have very poor sightlines for a proscenium stage performance, and should not be sold. Left empty they suggest a half empty house. The architect's solution worked out with theater consultant George Izenour makes use of vertical rectangular panels which are housed against the side walls of the theater during apron stage productions, but swing out on winch driven booms to relocate vertically at the edge of the side aisles to conceal the blocks of unusable seats during a proscenium stage performance.

A power driven moveable seat bank stored underneath the permanent orchestra seats can be moved into place when the proscenium stage is used. A large lift handles the fore portion of the apron stage and the moveable seat platform. The small lift puts in place the curved segment which is the fore portion of the proscenium stage and the rear portion of the apron stage. This segment can be lowered to serve as the orchestra pit floor and is also used as a freight elevator for deliveries to the stage from the traproom.

Below the centerline which joins the two half plans the power operated steel space frame concert shell is shown in open position.

According to Izenour: "This is the first attempt anywhere to structurally and mechanically alter the shape of an auditorium of this size to accommodate the two separate and distinct seating geometries for proscenium and apron stages."

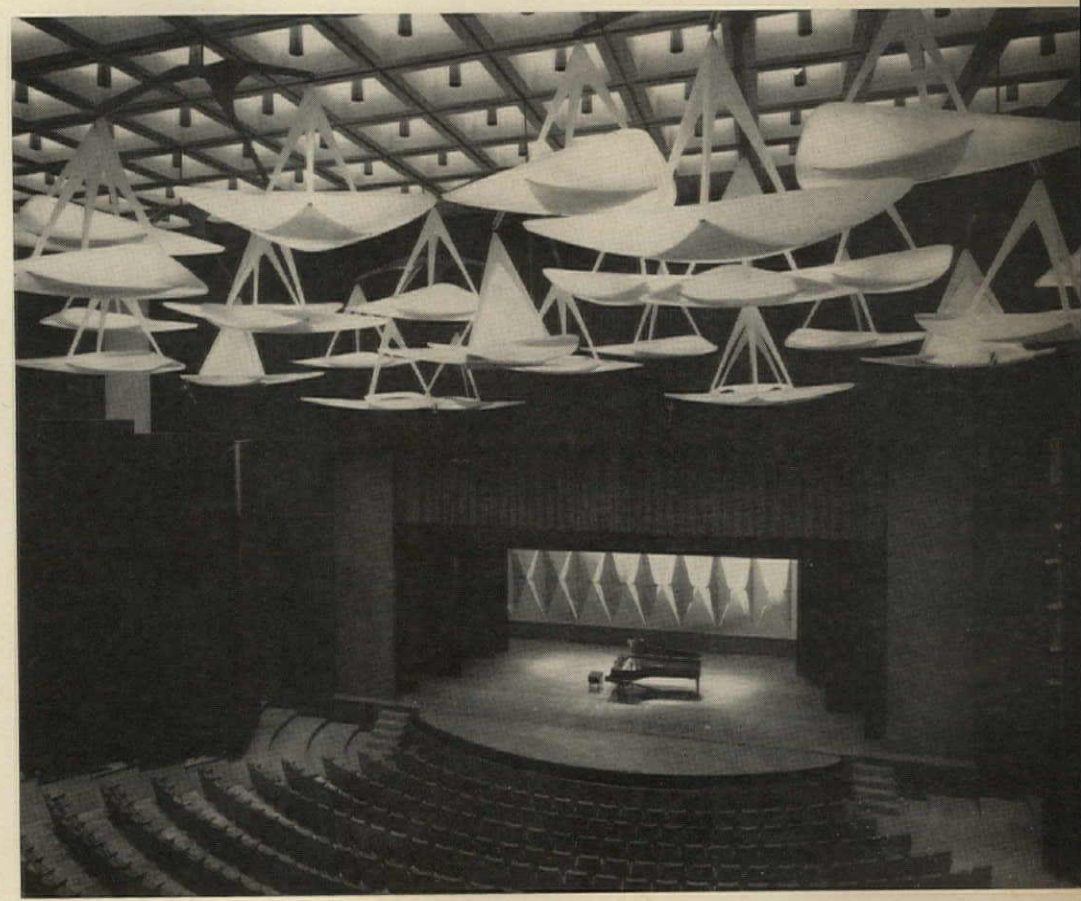




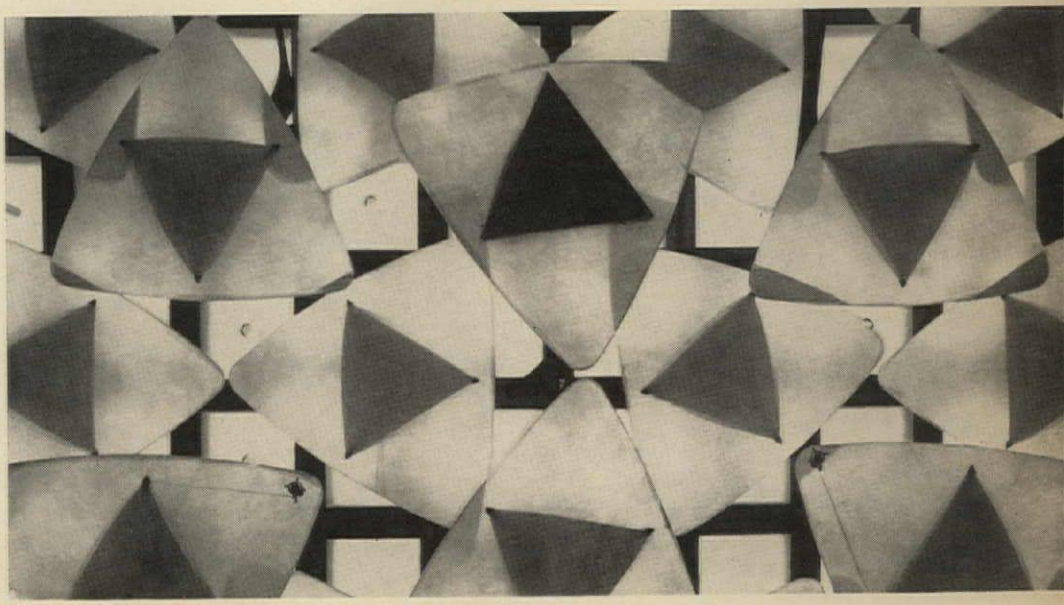
A Baldachino for Better Acoustics

The acoustical clouds in this theater are referred to by the architects as the baldachino, a work of sculpture in translucent plastic by Gérard Tremblay to the specifications of the acoustical consultants. The baldachino aids speech intelligibility in the proscenium theater arrangement, achieves musical clarity, liveness and balance of sound for concert hall use, and conceals the loud speakers and microphones for sound reinforcement for apron stage uses where frequently the actor's back is to the audience. It is available for "pop" or folk singers, and musical comedy or opera singers who need it. Amplification is neither required nor considered desirable for orchestra or chorus.

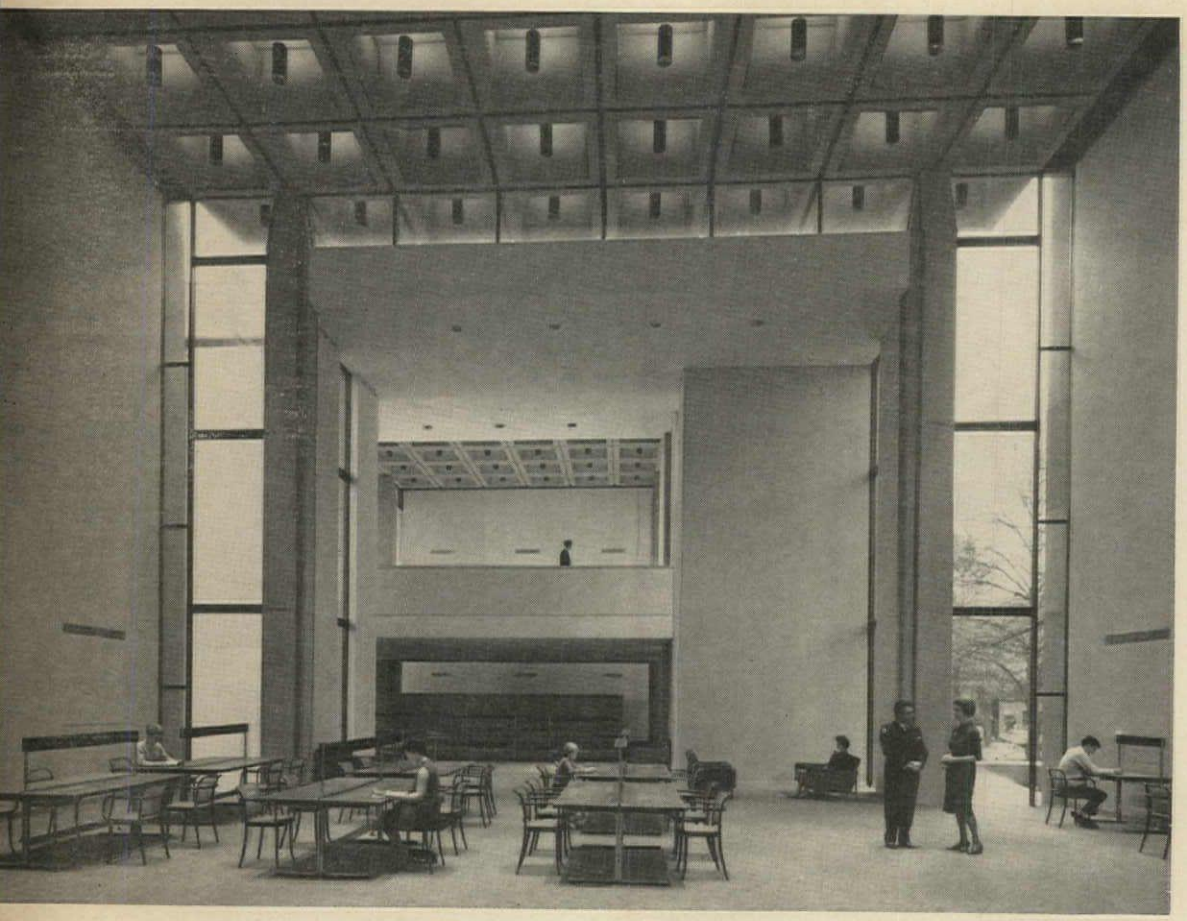
For concerts the moveable side wall panels are usually projected forward as they are for proscenium stage performances to conceal the side seats. When these seats are included there is some loss of acoustical quality in concert performance. The moveable side wall panels contain sound absorbing material shielded by adjustable aluminum louvers which in the closed position are sound reflecting. The acoustical consultants, David L. Klepper and Russell Johnson of Bolt, Beranek and Newman, Inc., recommend that the louvers be shut for concerts, usually shut for proscenium plays, but always opened for apron stage plays to insure the lowest possible reverberation time and to avoid long delayed reflections. Adjustable draperies on the rear and front walls cover a hard sound-reflective surface. Closed they decrease reverberation time, open they cause it to be increased. The theater seats have expanded metal bottoms permitting sound energy to reach the sound absorbing upholstery.



Acoustical clouds are translucent and when backlighted become the chandelier

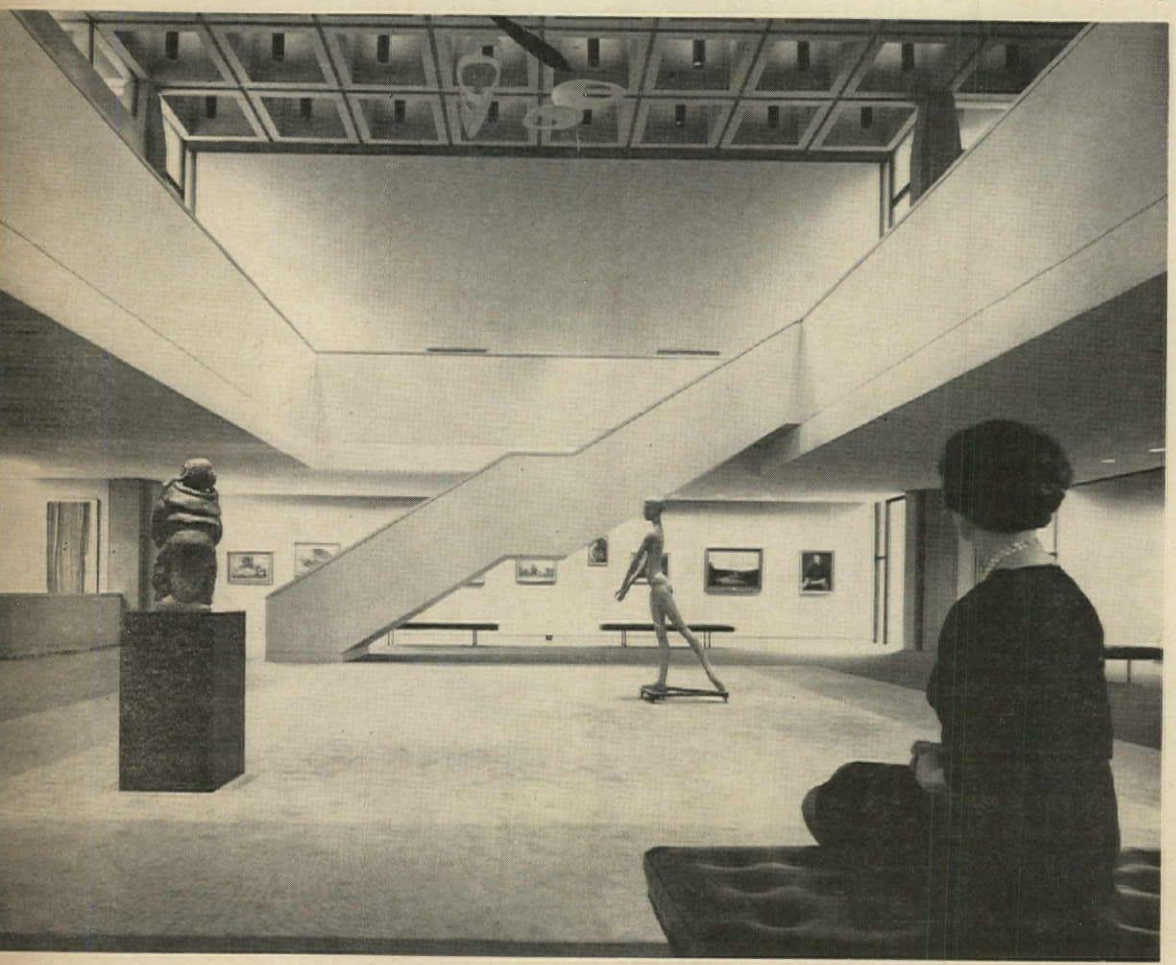


Chris F. Payne



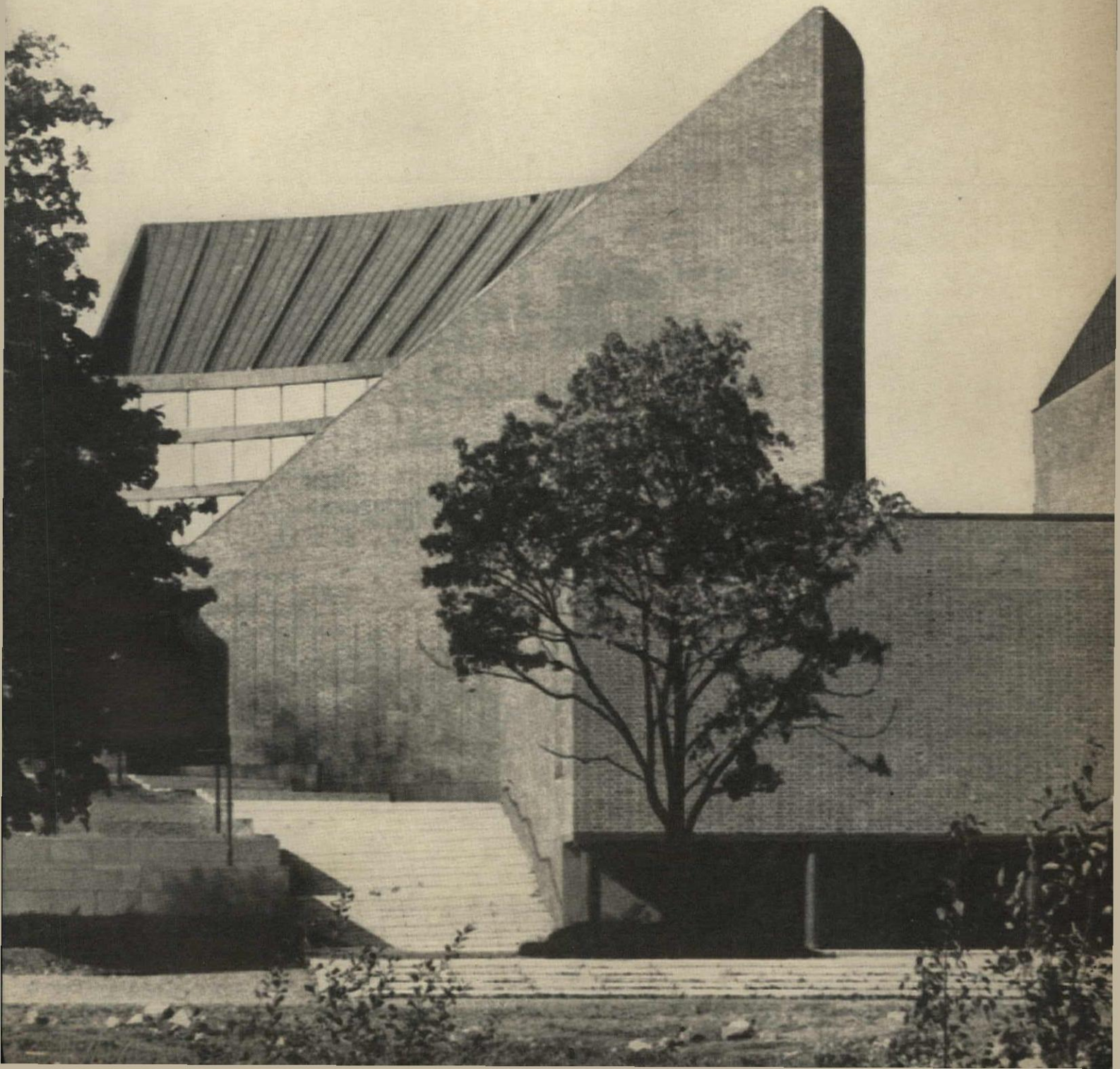
Main reading room of library

Art gallery



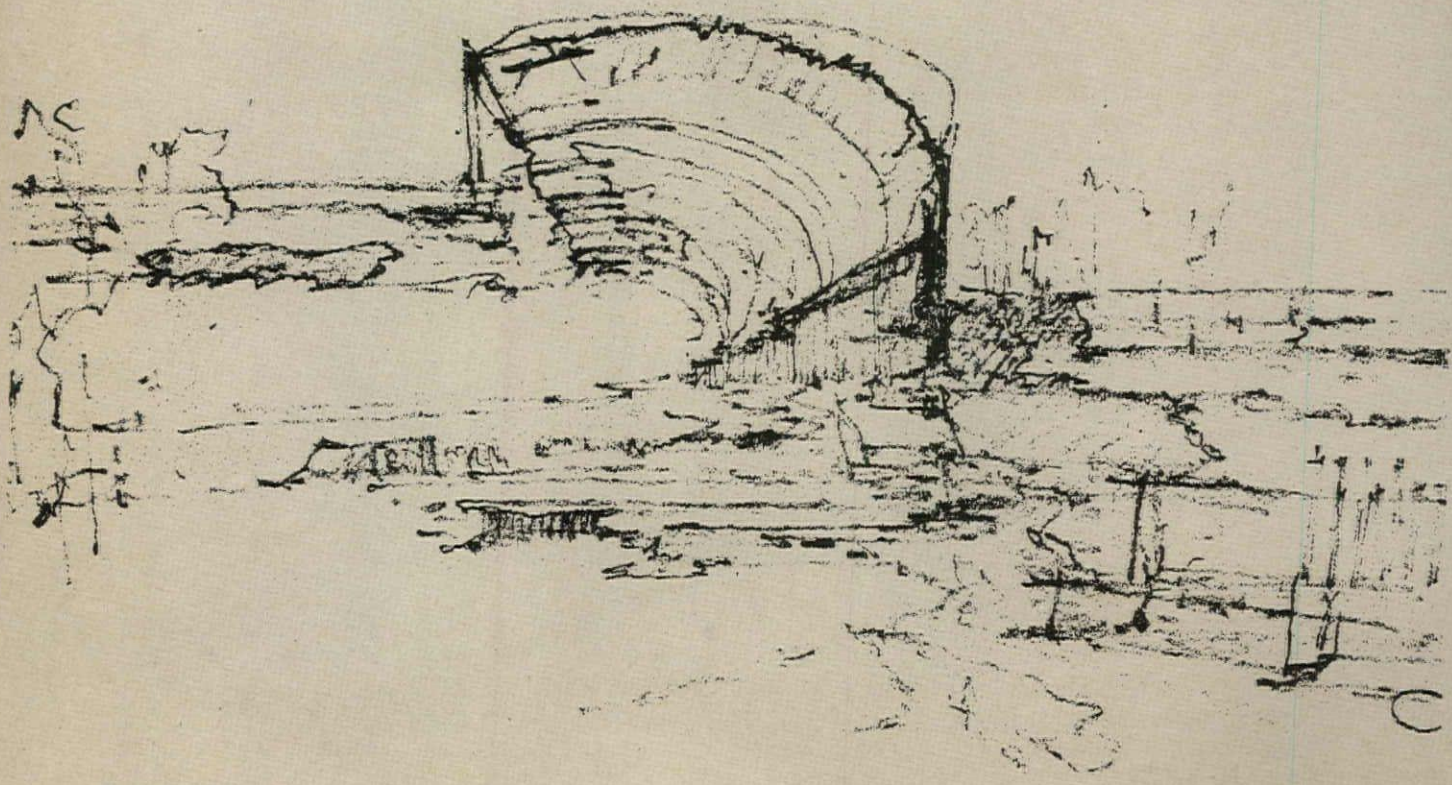
UNIVERSITY BUILDING BY A MASTER HAND

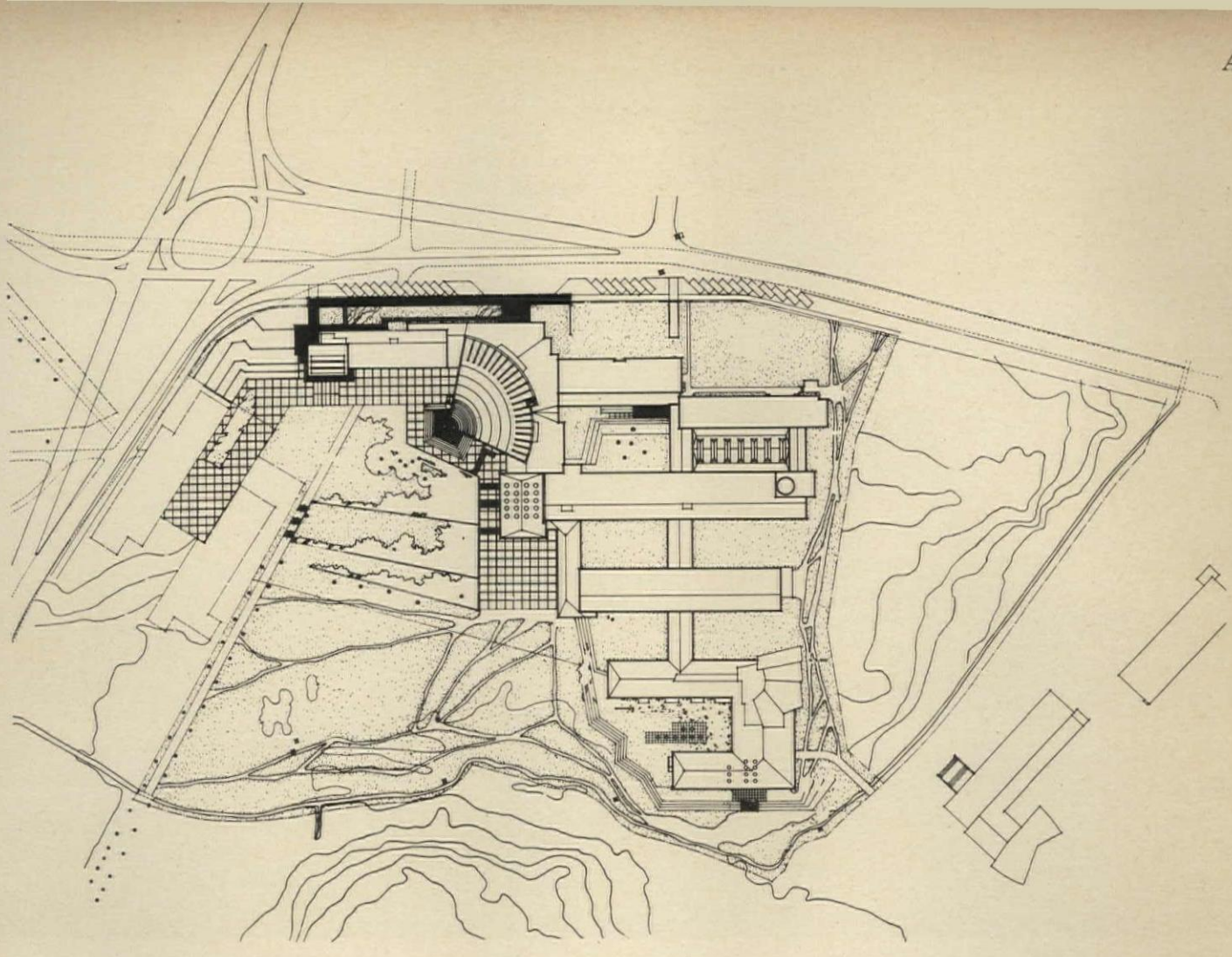
Alvar Aalto's new classroom complex for the Finnish Technical Institute shows an expert understanding of the composition of a campus



Exterior of main auditoriums showing how roof forms an outdoor amphitheater *Eva and Pertti Ingervo photos*

Aalto's first conceptual sketch for the building. ("Alvar Aalto" © 1964 by Wittenborn & Co., all rights reserved)

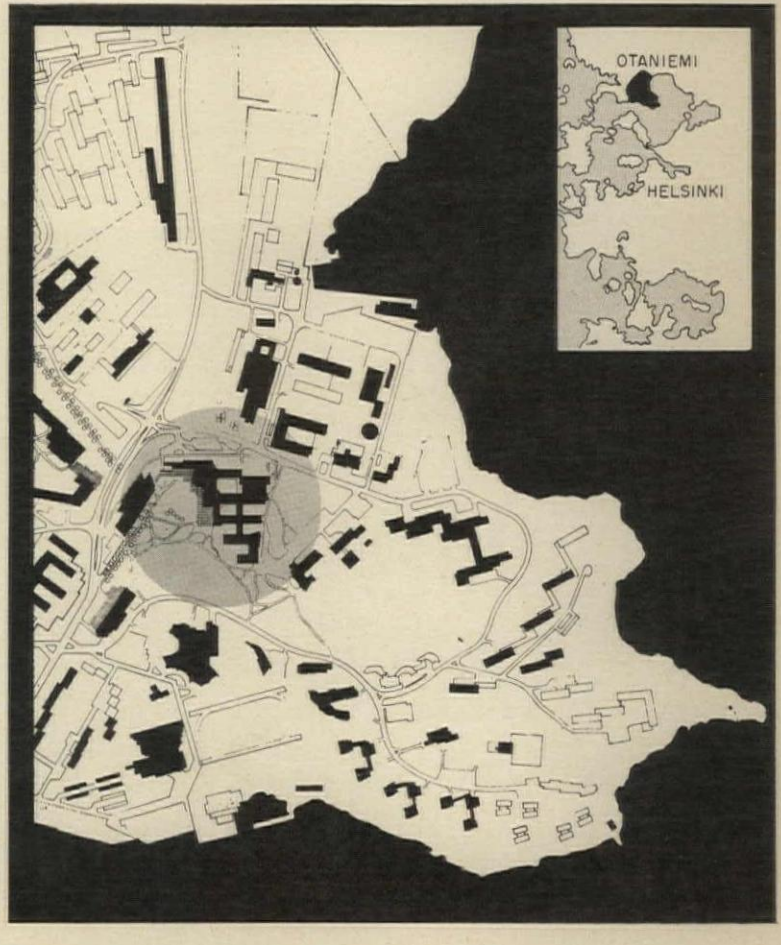




Focal Point of the Campus

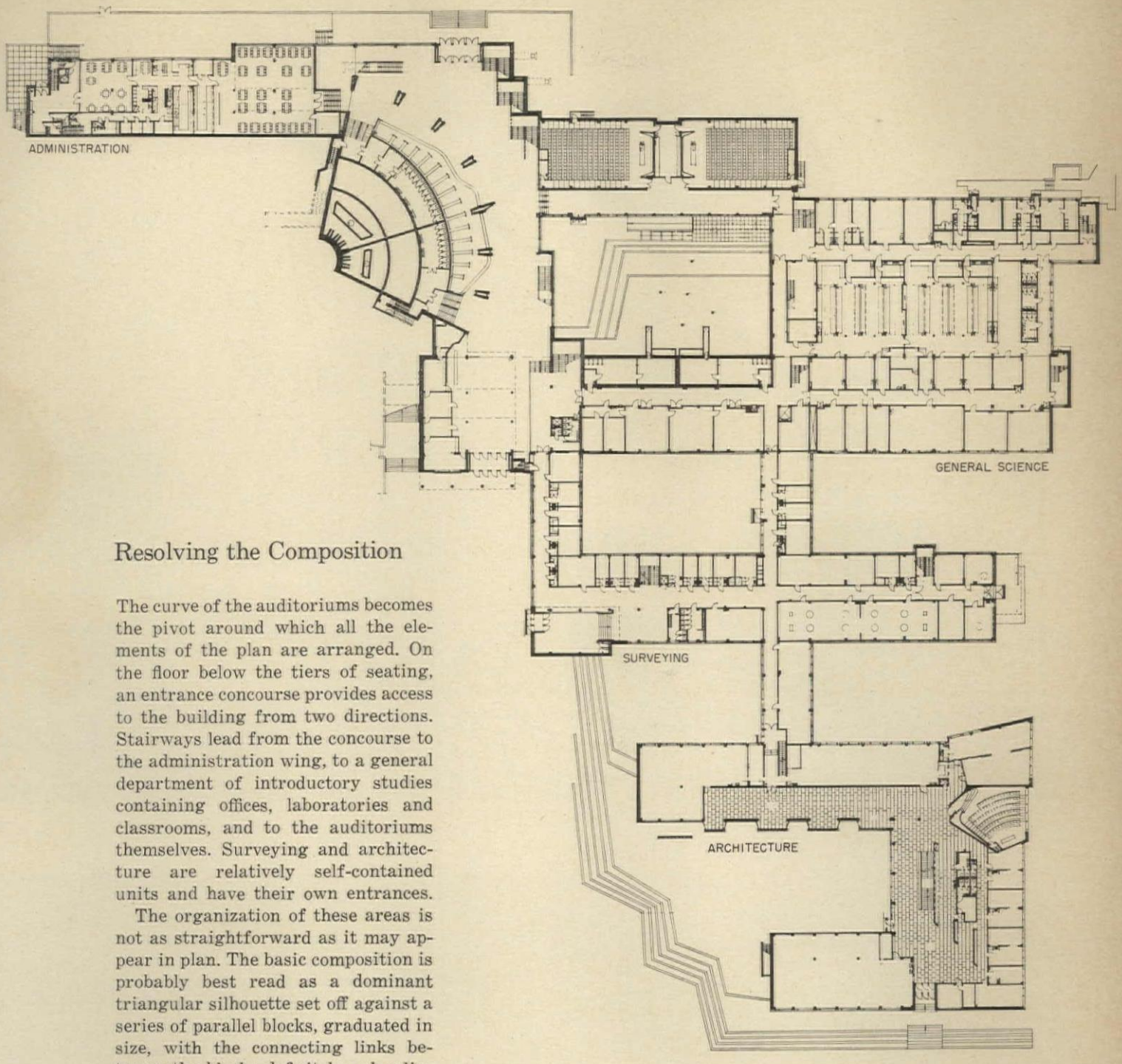
Alvar Aalto's main classroom building for the Finnish Technical Institute uses the elements of the program, and the character of the site to produce a clear and unforced design which has its own natural order. The master plan for the whole campus is also Aalto's design, the result of a competition held in 1949, when the hundred-year-old institute of technology first decided to move from Helsinki to a site in suburban Ottaniemi. The major aspects of this plan have now been carried out, although most of the buildings were designed by other architects.

The main academic building was planned from the beginning to occupy a hill top in the center of the site; and the lecture halls, which are the center of the system of instruction, have been emphasized in such a way that they become a visual focal point for the whole campus. The conceptual sketch (*left*) shows that Aalto visualized the amphitheater form of the roof long before the rest had become clear in his mind.



Stair to terrace and outdoor amphitheater

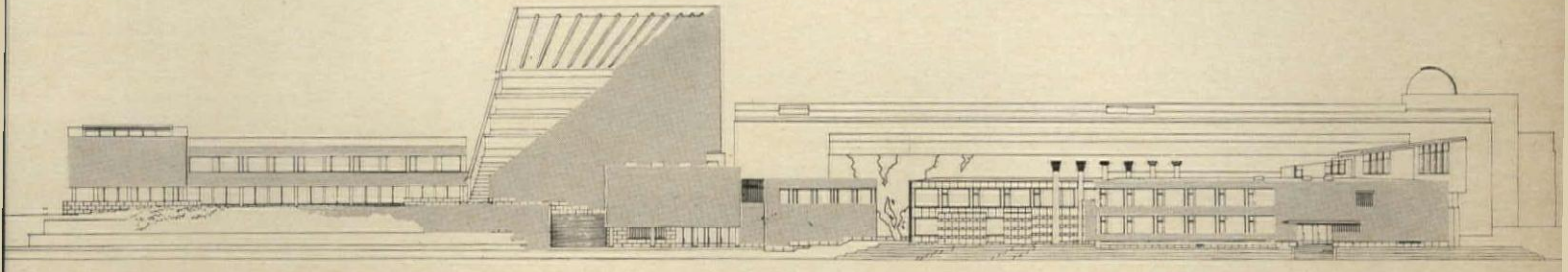
View of Surveying Department, with General Department in background

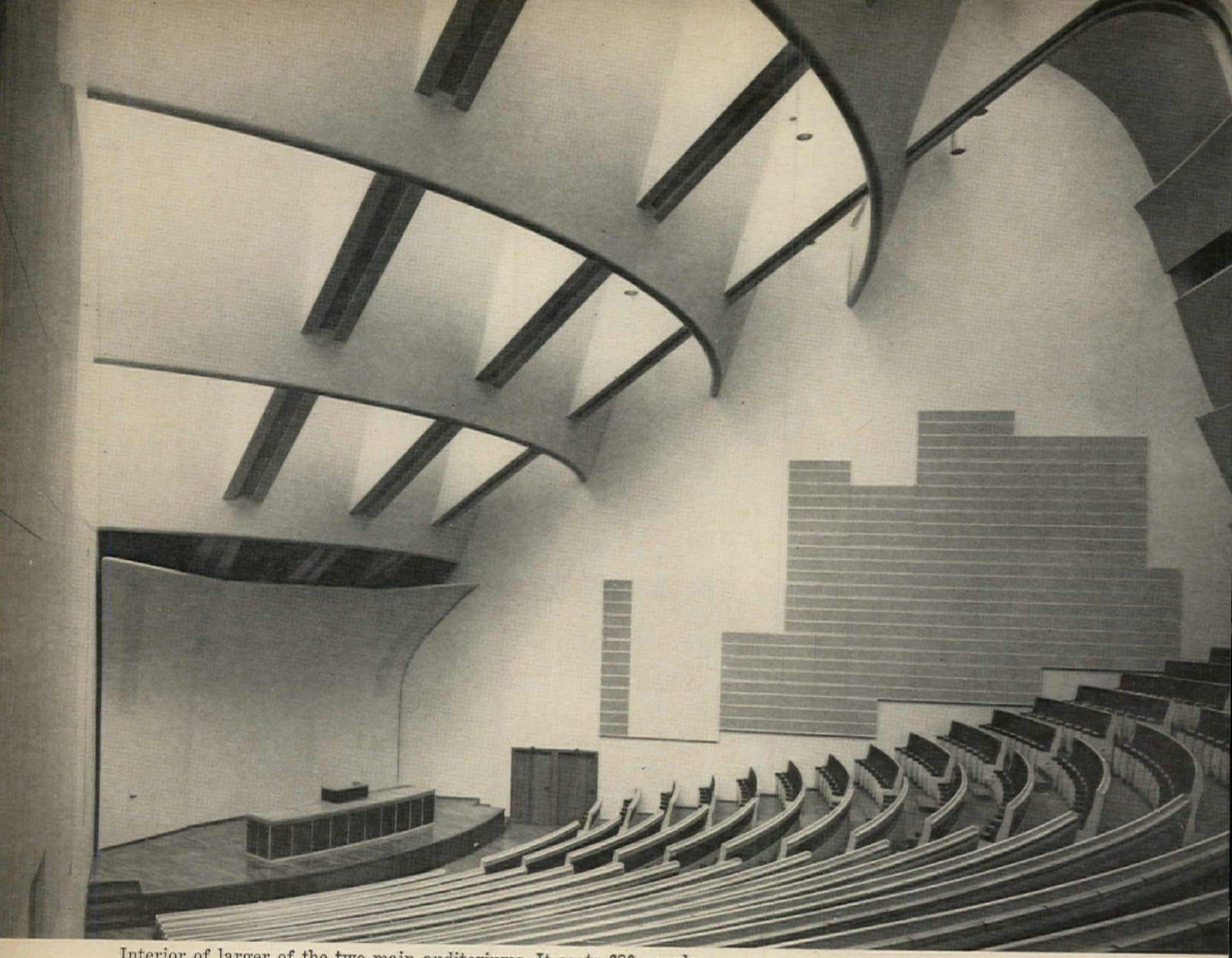


Resolving the Composition

The curve of the auditoriums becomes the pivot around which all the elements of the plan are arranged. On the floor below the tiers of seating, an entrance concourse provides access to the building from two directions. Stairways lead from the concourse to the administration wing, to a general department of introductory studies containing offices, laboratories and classrooms, and to the auditoriums themselves. Surveying and architecture are relatively self-contained units and have their own entrances.

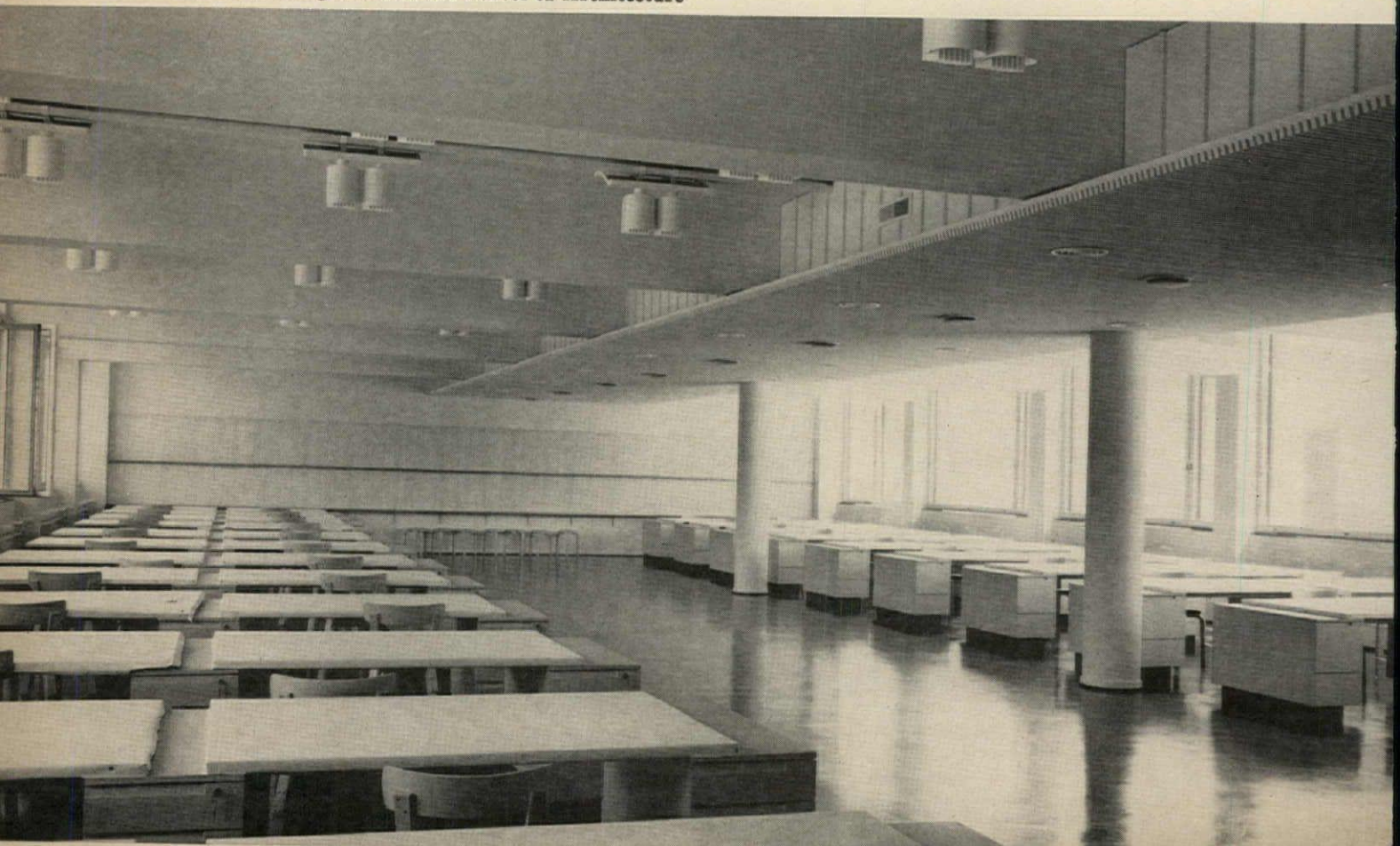
The organization of these areas is not as straightforward as it may appear in plan. The basic composition is probably best read as a dominant triangular silhouette set off against a series of parallel blocks, graduated in size, with the connecting links between the blocks definitely subordinated. This aspect of the design is clearly visible in the elevation below. A small auditorium in the architectural school, the skylights at the end of the administration wing, and the dome of the observatory serve to resolve the sharp opposition between triangular and rectilinear forms.

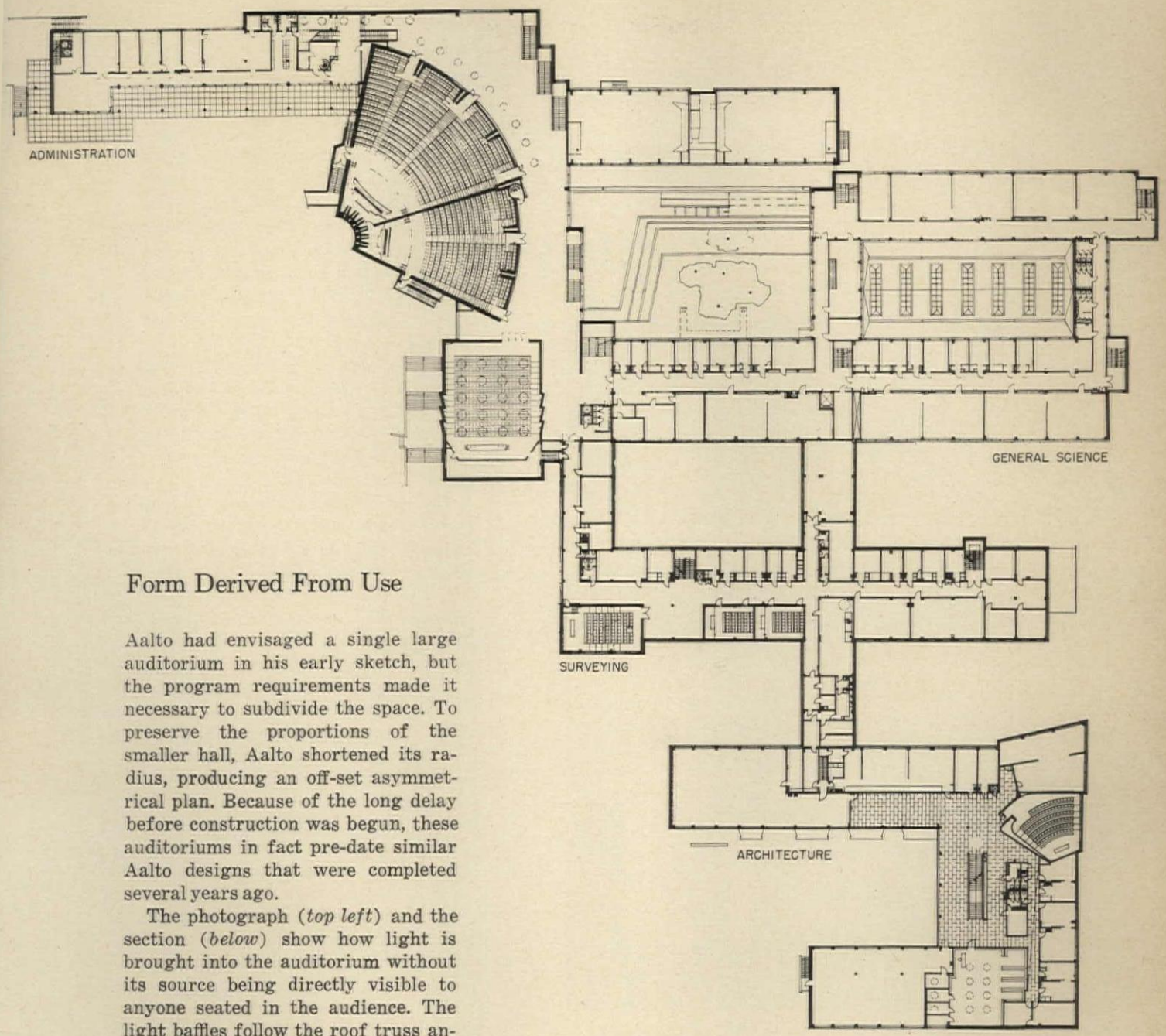




Interior of larger of the two main auditoriums. It seats 680 people

One of the drafting rooms in the School of Architecture

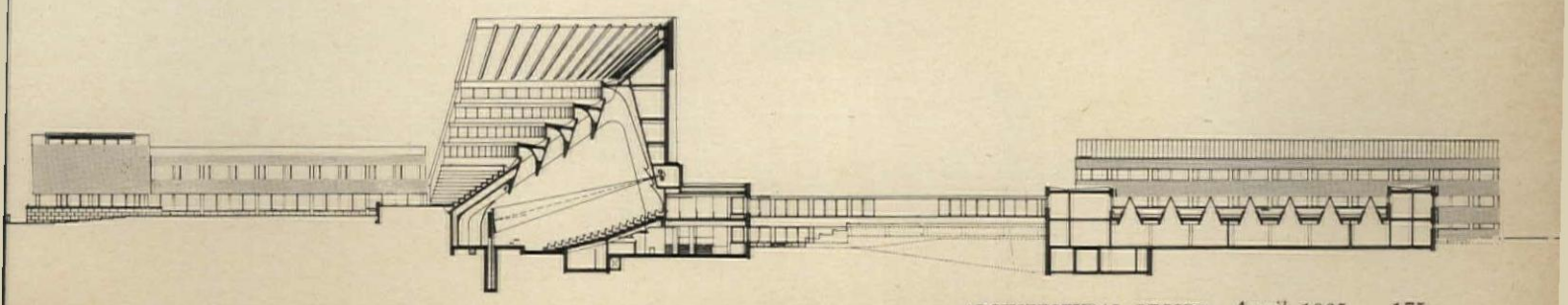


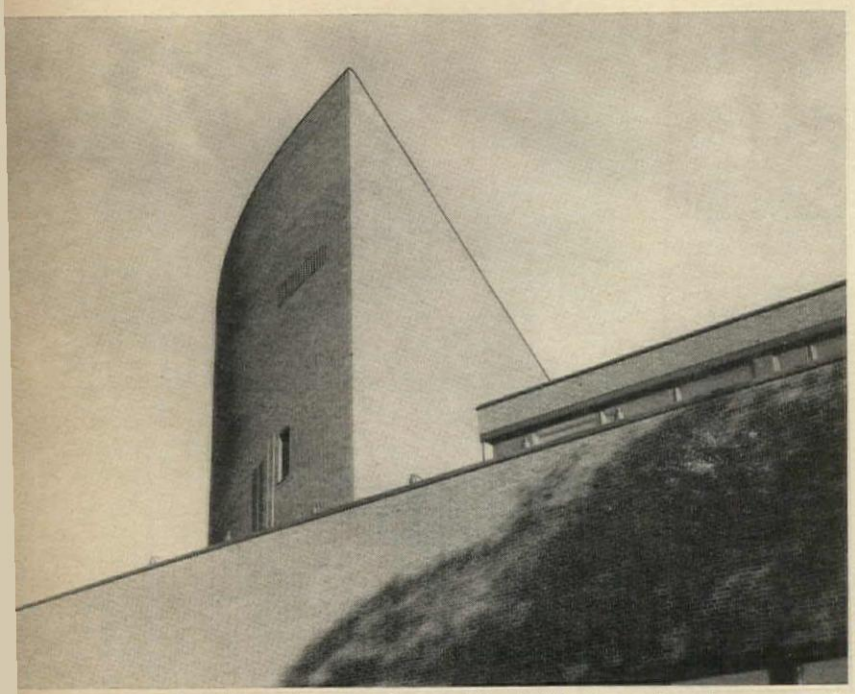


Form Derived From Use

Aalto had envisaged a single large auditorium in his early sketch, but the program requirements made it necessary to subdivide the space. To preserve the proportions of the smaller hall, Aalto shortened its radius, producing an off-set asymmetrical plan. Because of the long delay before construction was begun, these auditoriums in fact pre-date similar Aalto designs that were completed several years ago.

The photograph (*top left*) and the section (*below*) show how light is brought into the auditorium without its source being directly visible to anyone seated in the audience. The light baffles follow the roof truss angle, which is determined by acoustical considerations. The exterior form is, therefore, the logical result of the synthesized requirements of light and sound. While the form is dramatic, it is far from arbitrary. Automatic traveling curtains darken the hall when necessary, and a screen on a hydraulic lift can be brought up from the floor behind the lectern.

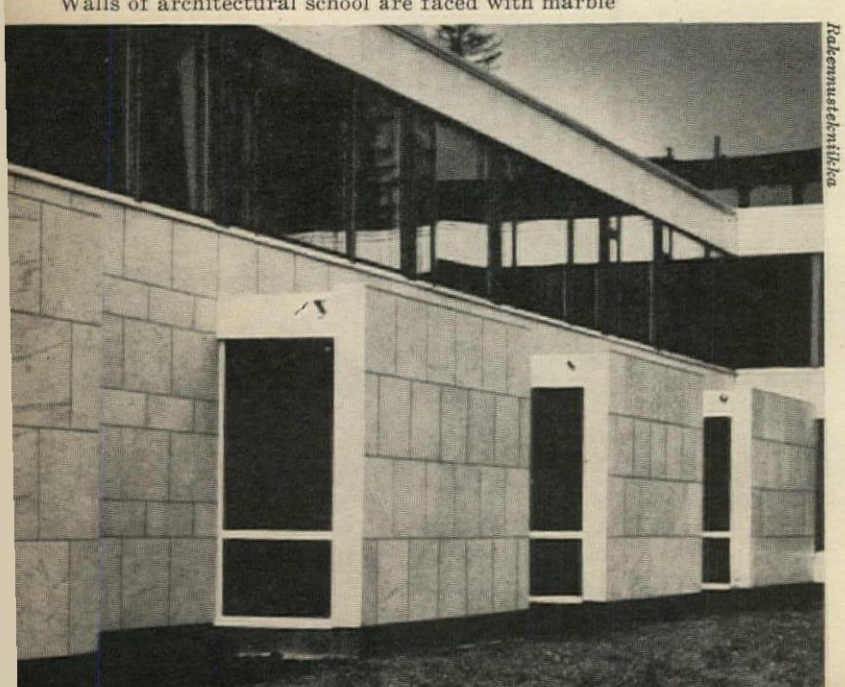




Triangular silhouette of auditorium is visible from almost every angle

Space beneath auditorium is entrance concourse and check rooms

Walls of architectural school are faced with marble



Rakennustekniikka

Commentary

By Frederick Gutheim

Like most of Aalto's work, the main provisions of this building—offices for professors, classrooms, student facilities—call for little that is extraordinary architecture. But, against this rather quiet background, the dramatic interior spaces and exterior forms are a vivid contrast. The generously proportioned entrance hall serves as a sort of interior plaza where the traffic of the building is collected and distributed. Above it is the building's most highly charged feature, two lecture halls with lofty, spectacular ceilings and superb, if severe, detailing.

In this northern climate, a more complete, sustained interior life is required. The dark winters also emphasize the importance of lighting, and the silhouette formed by structures in the long periods of twilight. The distinctive interior form of the pair of lecture halls is echoed in its curving red brick shell with its copper and glass exterior. This statement, with its triangular silhouette, rises above the surrounding planes of the building. At night it glows; by day it reflects. Altogether it fittingly crowns this major architectural effort. Here Aalto has synthesized and expressed in more perfectly integrated manner his vocabulary of recent years: the granite base, the white marble finishing of selected areas, the red brick walls, the abundant use of copper for roofs and flashing.

The building as a whole provides shelter from the Baltic winds to most students approaching on foot; and its terraces and overhangs (not to exclude the terraced exterior of the lecture halls) recognize their use of these frequently sunny open spaces. In such provisions the design strikes a wise balance between the formality of an academic structure and the inevitable informality of student life and activity. With all its seriousness, it has many light-hearted moments.

The college of architecture (with about 200 students) is located at one end of the building, and its rather separate quarters are distinguished further by their facing of white marble. The halls in this area are widened to become exhibition spaces, and look into courts that will contain objects of architectural *virtu*.

This article describes a new way of analyzing the functions of a building so that the design may more accurately reflect every requirement of the program

THE THEORY AND INVENTION OF FORM

By Christopher Alexander

Today more and more design problems are reaching insoluble levels of complexity. This is true not only of moon rockets and computers, whose complexity is internal, but also of towns and buildings, which have acquired a background of needs and activities so diverse, and so intricately related, that it is becoming extremely difficult to grasp them fully.

At the same time that design problems increase in complexity, their character is changing very rapidly. New materials are developed all the time; social patterns alter quickly; the culture itself is changing faster than it has ever changed before.

To match the growing complexity of problems there is a rapidly growing body of information and specialist experience. This information is hard to handle; it is widespread, diffuse, unorganized. Moreover, the quantity of information is now beyond the reach of the individual designer. The various specialists who retail it are narrow and unfamiliar with the form-makers' peculiar problems, so that it is never clear how the designer should best consult them. In addition, since cultural pressures change so fast, any gradual development of form, like that which took place in traditional societies, has now become impossible. Bewildered, the form-maker stands alone. He has to make clearly conceived forms at once, without the possibility of trial and error over time.

If we look at the lack of organization and lack of clarity of the forms around us, it is plain that their design has often taxed their designer's cognitive capacity well beyond the limit.

The following argument is based on the assumption that physical clarity cannot be achieved in a

Christopher Alexander is a young English mathematician who is presently an assistant professor of architecture at the University of California in Berkeley. This article is based on his doctoral thesis at Harvard University, which was published by the Harvard University Press under the title "Notes on the Synthesis of Form"

This is a theory about the process of design;
the process of inventing physical things which display a new organization
and form in response to function . . .

form until there is first some programmatic clarity in the designer's mind and actions; and that for this to be possible, in turn, the designer must first trace his design problem to its earliest functional origins and be able to find some sort of determining pattern in them.

Ideally, then, a form should reflect all the known facts relevant to its design. In practice, however, the average designer scans whatever information he happens on, consults a consultant now and then when faced by extra-special difficulties, and introduces this randomly selected information into forms otherwise dreamt up in the artist's studio of his mind. The information needed to produce an integrated form has gotten out of hand—and well beyond the fingers of the individual designer.

The idea that the capacity of man's invention is limited is not so surprising, after all. In other areas it has been shown, and we admit readily enough, that there are bounds to man's cognitive and creative capacity. We know, for example, that there are limits to an individual's capacity for mental arithmetic. But to solve a difficult problem in arithmetic we need a way of setting it down so that the problem becomes more clear. Ordinary arithmetical convention gives us such a way. Two minutes with a pencil on the back of an envelope lets us solve problems which we could not do in our heads if we tried for a hundred years.

At present we have no corresponding way of simplifying design problems for ourselves. These pages describe a way of representing design problems which does make them easier to solve. It is a way of reducing the gap between the designer's small capacity and the great size of his task.

Definition of the Design Problem

The ultimate object of design is form.

Every design problem begins with an effort to achieve fitness between two entities: the form in question and its context.

The reason that iron filings placed in a magnetic field exhibit a pattern—or have form, as we say—is that the field they are in is not homogeneous. If the world were totally regular and homogeneous, there would be no forces, and no forms. Everything would be amorphous. But an irregular world tries to compensate for its own irregularities by fitting itself

* This example is based on one given by W. Ross Ashby in "Design for a Brain," 2nd edition, New York, 1960, page 155

. . . A form that fits its purpose
is a response to many specific physical relationships,
each of which must be solved successfully . . .

to them, and thereby takes on form. The form, then, is that part of the world which we decide to shape, while leaving the rest of the world as it is. The context is that part of the world which puts demands on this form; anything in the world that makes demands of the form is the context. In other words, the form is the solution to the problem; the context defines the problem. Fitness is the relation of mutual acceptability between these two. In a problem of design we want to satisfy the mutual demands which the two make on one another.

To characterize the fit between form and context, let us consider a simple specific case.

Fit and Misfit Variables

It is common practice in engineering, if we wish to make a metal face perfectly smooth and level, to fit it against the surface of a standard steel block, which is level within finer limits than those we are aiming at. We ink the surface of this standard block and rub the metal face against the inked surface. If the metal face is not quite level, ink marks appear on it at those points which are higher than the rest. We grind away these high spots and try to fit it against the block again. The face is level when it fits the block perfectly, so that there are no high spots that stand out any more.

Since the context is fixed, and only the form variable, we may distinguish good fit from bad experimentally, by inking the standard block, putting the metal face against it, and checking the marking that gets transferred.

In design we cannot define the context as levelness can be defined, but we can still detect specific misfits which correspond to high spots on the block. A place between stove and cabinet which you can't reach with a broom, rainwater coming in, over-crowding and lack of privacy, the eye-level oven which spits hot fat right into your eye, and the front door you cannot find, are all misfits between the house and the lives and habits it is meant to fit.

Wherever an instance of misfit occurs in the form-context ensemble, we are able to point specifically at what fails and to describe it. It seems as if in practice the concept of good fit, describing only the absence of such failures and hence leaving us nothing concrete to refer to in explanation, can only be explained indirectly; the incongruities in an ensemble are the primary data of experience. Good fit in every-day experience is the absence of all possible misfits.

With this in mind, we should always expect to see the process of achieving good fit between form and context as a negative process of neutralizing the incongruities, or irritants, or forces, which cause the misfits to occur.

We are now in a position to define the design situation as follows: if we divide an ensemble into form and context, the fit between them may be regarded as an orderly condition of the ensemble, subject to disturbances in various ways, each a potential misfit.

We may summarize the state of each potential misfit by characterizing it as a binary variable. If the misfit occurs, we say the variable takes the value 1. If the misfit does not occur, we say the variable takes the value 0. Each binary variable stands for one possible kind of misfit between form and context. The value this variable takes, 0 or 1, describes a state of affairs that is not either in the form alone or in the context alone, but a relation between the two. The state of this relation, fit or misfit, describes a particular aspect of the whole ensemble. It is a condition of harmony and good fit in the ensemble that none of the possible misfits should actually occur. We represent this fact by demanding that all the variables take the value 0.

We can now say that the task of design is not to create a form which meets certain conditions, but to create such an order in the form-context ensemble that all the variables will take the value 0. The form is simply that part of the ensemble over which we have control. It is only by manipulating the form that we can create order in the ensemble.

Subsystems of Variables

At any moment in a form-making process, each of the variables involved is in a state of either fit or misfit. As form-making proceeds, so the system of variables changes state. One misfit is eradicated, another misfit occurs, and these changes in their turn set off reactions within the system that affect the state of other variables. We shall perhaps understand this process better if we make a simple picture of it.

Imagine a system of a hundred lights.* Each light can be in one of two possible states. In one state the

. . . These physical relationships interact, and a problem can be solved only when these interactions can be patterned into small and relatively independent sub-systems . . .

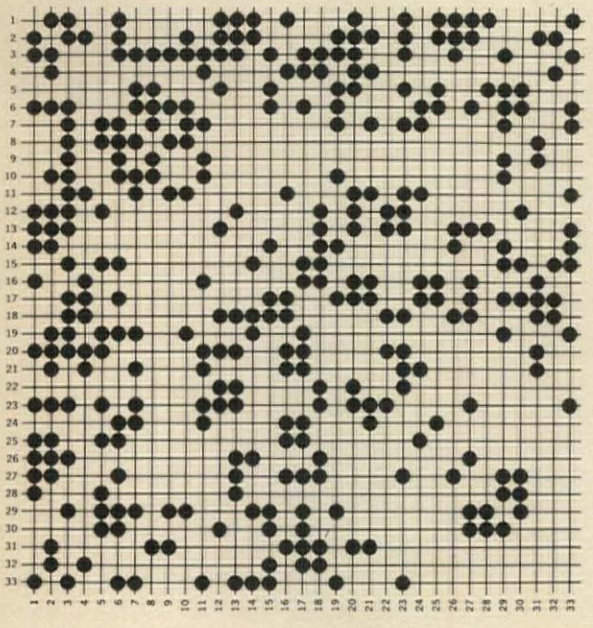


Diagram of interaction between 33 misfit variables in a problem. From "Community and Privacy" by Serge Chermayeff and Christopher Alexander. © 1963 by Serge Chermayeff, all rights reserved

light is on. The lights are so constructed that any light which is on always has a 50-50 chance of going off in the next second. In the other state the light is off. Connections between lights are constructed so that any light which is off has a 50-50 chance of going on again in the next second, provided at least one of the lights it is connected to is on. If the lights it is directly connected to are off, for the time being it has no chance of going on again, and stays off. If the lights are ever all off simultaneously, then they will all stay off for good, since when no light is on, none of the lights has any chance of being reactivated. This is a state of equilibrium. Sooner or later the system of lights will reach it.

Description of the Successful Design Process

This system of lights will help us understand the history of a form-making process. Each light is a binary variable, and so may be thought of as a misfit variable. The off state corresponds to fit; the on state corresponds to misfit. The fact that a light which is on has a 50-50 chance of going off every second, corresponds to the fact that whenever a misfit occurs efforts are made to correct it. The fact that lights which are off can be turned on again by connected lights, corresponds to the fact that even well-fitting aspects of form can be unhinged by changes initiated to correct some other misfit because of connections between variables. The state of equilibirum, when all the lights are off, corresponds to perfect fit or adaptation. It is the equilibrium in which all the misfit variables take the value 0. Sooner or later the system of lights will always reach this equilibirum. The only question that remains is, how long will it take for this to happen? It is not hard to see that, apart from chance, this depends only on the pattern of interconnections between the lights.

Let us consider two extreme circumstances:

1. On the one hand, suppose there are no interconnections between lights at all. In this case there is nothing to prevent each light's staying off for good, as soon as it goes off. The average time it takes for all the lights to go off is therefore only a little greater than the average time it takes for a single light to go off, namely 2^1 seconds or 2 seconds.

2. On the other hand, imagine such rich interconnections between lights than any one light still

. . . The form that the building will take
derives from these sub-systems of physical relationships . . .

on quickly rouses all others from the off state and puts them on again. The only way in which this system can reach adaptation is by the pure chance that all 100 happen to go off at the same moment. The average time which must elapse before this happens will be of the order of 2^{100} seconds, or 10^{22} years.

The second case is useless. The age of the universe itself is only about 10^{10} years. For all intents and purposes the system will never adapt. But the first case is no use either. In any real system there are interconnections between variables which make it impossible for each variable to adapt in isolation. Let us therefore construct a third possibility.

3. In this case suppose there are again interconnections among the 100 lights, but that we discern in the pattern of interconnections some 10 principle sub-systems, each containing 10 lights. The lights within each sub-system are so strongly connected to one another that again all 10 must go off simultaneously before they will stay off; yet at the same time the sub-systems themselves are independent of one another so that the lights in one sub-system can be switched off without being reactiviated by others flashing in other systems. The average time it will take for all 100 lights to go off is about the same as the time it takes for one sub-system to go off, namely 2^{10} seconds, or about a quarter of an hour.

A Vital Lesson

Of course, real systems do not behave so simply. But 15 minutes is not much greater than the two seconds it takes an isolated variable to adapt, and the enormous gap between these magnitudes and 10^{22} years does teach us a vital lesson. No complex adaptive system will succeed in adapting in a reasonable amount of time unless the adaptaton can proceed sub-system by sub-system, each sub-system relatively independent of the others.

This is a familiar fact. It finds a close analogy in the children's sealed glass-fronted puzzles which are such fun and so infuriating. The problem, in these puzzles, is to achieve certain configurations within the box: rings on sticks, balls in sockets, pieces of various shapes in odd-shaped frames—but all to be done by gentle tapping on the outside of the box. Think of the simplest of these puzzles, where half a dozen-colored beads, say, are each to be put in a hole of corresponding color.

One way to go about this problem would be to pick the puzzle up, give it a single energetic shake, and lay it down again, in the hope that the correct configuration would appear by accident. This all-or-nothing method might be repeated many thousand times, but it is clear that its chances of success or negligible. It is the technique of a child who does not understand how best to play. Much the easiest way—and the way we do in fact adopt under such circumstances—is to juggle one bead at a time. Once a bead is in, provided we tap gently, it is in for good; then we are free to manipulate the next one that presents itself, and we achieve the full configuration step by step. When we treat each bead as an isolable sub-system, and take the sub-systems independently, we can solve the puzzle.

We may, therefore, picture the process of form-making as the action of a series of sub-systems, all interlinked, yet sufficiently free of one another to adjust independently in a reasonable amount of time. It works, because the cycles of correction and re-correction, which occur during adaptation, are restricted to one sub-system at a time.

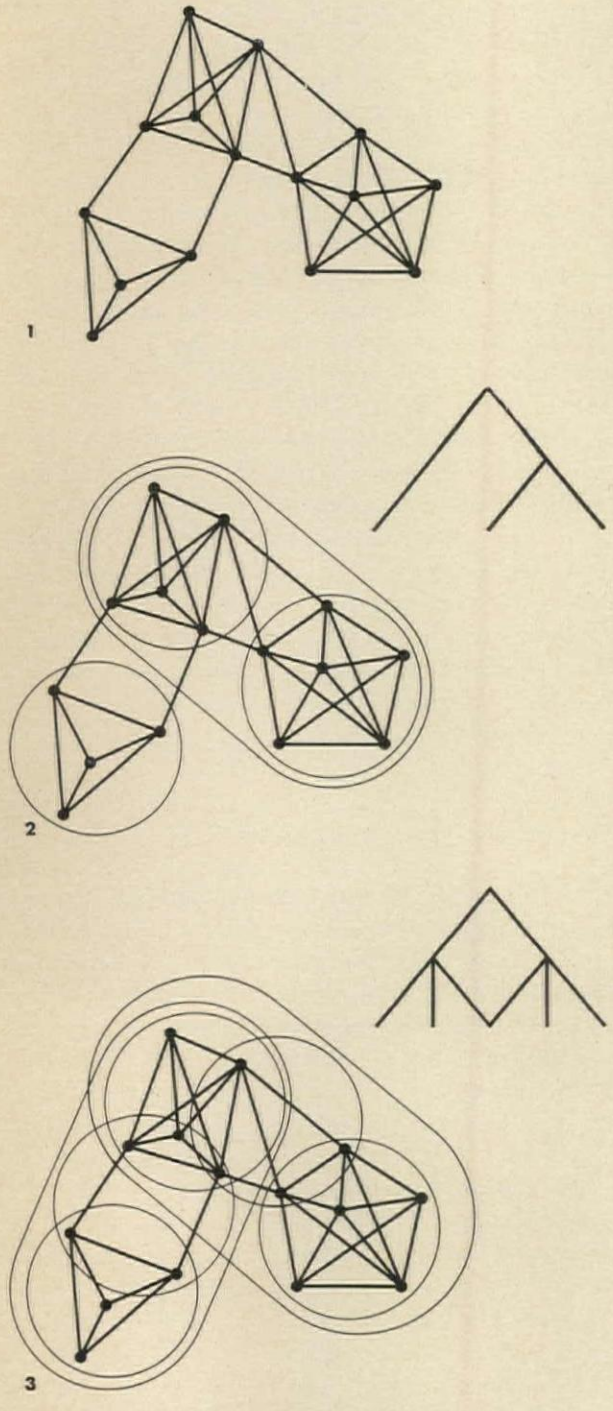
Structure of the Design Process

Here is the problem. We wish to design clearly conceived forms which are well adapted to some given context. We have seen that for this to be feasible, the adaptation must take place independently within independent subsystems of variables. To explore the structure of these sub-systems, we must use the concept of the set.

A set, just as its name suggests, is any collection of things whatever, without regard to common properties, and has no internal structure until it is given one. A collection of riddles in a book forms a set, a lemon and an orange and an apple form a set. The elements of a set can be as abstract or as concrete as you like. It must only be possible to distinguish them from one another.

Let us be specific about the use of set theory to picture design problems. As we have said, a design problem presents itself as a task of avoiding a number of specific potential misfits between the form and some given context. Let us suppose that there are m such misfit variables: $x_1 \ . \ . \ . \ x_m$. These misfit variables form a set. We call the set of these m misfits M, so that we write $x_i M$ (for all $i, i = 1 \ . \ . \ . \ m$).

. . . Once the physical relationships of a problem are stated, there will be a best form for that problem as stated . . .



(1) A diagram representing the interaction of a set of misfit variables. The points represent the variables, the lines are the relationships between them. (2) In these diagrams the set is given a tree-like substructure. The smaller circles represent subsystems of the larger ones. (3) These diagrams show the same set with an overlapping, or semi-lattice, substructure

The great power and beauty of the set, as an analytical tool for design problems, is that its elements can be as various as they need be, and do not have to be restricted only to requirements which can be expressed in quantifiable form. Thus in the design of a house, the set M may contain the need for individual solitude, the need for rapid construction, the need for family comfort, the need for easy maintenance, as well as such easily quantifiable requirements as the need for low capital cost and efficiency of operation. Indeed, M may contain any requirement at all.

When it stands alone, the set M has no structure. To give it structure we need a second set, the set of interactions. We know that misfit variables interact. Some of them interfere or conflict with one another, as the designer tries to solve them, others have common physical implications, or concur; and still others do not interact at all. It is the presence and absence of these interconnections which give the set M the systemic character already referred to. We represent the interactions by associating with M a second set L, of non-directed, signed, one-dimensional elements called links, where each link joins two elements of M, and contains no other elements of M.

The two sets M and L together define a structure known as a linear graph or topological 1-complex, which we shall refer to as $G(M, L)$ or simply G for short. A typical graph is shown above left (1).

We must now explore the structure of this graph. The most important and most obvious structural characteristic of any complex entity is its articulation—that is, the relative density or grouping and clustering of its component elements. We will be able to make this precise by means of the concept of a decomposition.

Informally, a decomposition of a set M into its subsidiary or sub-system sets is a hierarchical nesting of sets within sets, as is shown in the second drawing at left. The diagram beside it brings out the tree-like character of the decomposition. It refers to precisely the same structure as the other. Each element of the decomposition is a sub-set of those sets above it in the hierarchy. If some sub-sets overlap, the structure shown in diagram three results.

It is easy to see that the existence of the links makes some of the possible decompositions very much more sensible than others. Any graph of the type $G(M,L)$ tends to pull the elements of M to-

. . . even though a better statement of the problem may always yield a still better form

gether in natural clusters. Our task is to make this precise, and to decide which decomposition of M makes the most sense, once we have a given set L associated with it. Each sub-set of the set M which appears in the tree will then define a sub-problem of the problem M. Each sub-problem will have its own integrity, and be independent of the other sub-problems, and can therefore be solved independently.

The reader may well ask how such a process, in which both the requirements and the links between requirements are defined by the designer from things already present in his mind, can possibly have any outcome which is not also already present in the designer's mind. In other words, how can all this process really be helpful? The answer is that, because it concentrates on structure, the process is able to make a coherent, and therefore new, whole out of incoherent pieces.

The decomposition of the problem, is a way of identifying the problem's major functional aspects. But what kind of physical form, exactly, is the designer likely to realize with the help of such a program? Let us look at the form problem from the beginning.

The Organization of Form

The organization of any complex physical object is hierarchical. It is true that, if we wish, we may dismiss this observation as an hallucination caused by the way the human brain, being disposed to see in terms of articulations and hierarchies, perceives the world. On the whole, though, there are good reasons to believe in the hierarchical subdivision of the world as an objective feature of reality. Indeed, many scientists, trying to understand the physical world, find that they have first to identify its physical components, much as I have argued in these notes for isolating the abstract components of a problem. To understand the human body you need to know what to consider as its principal functional and structural divisions. You cannot understand it until you recognize the nervous system, the hormonal system, the vasomotor system, the heart, the arms, legs, trunk, head, and so on as entities. You cannot understand chemistry without knowing the pieces of which molecules are made. You cannot claim to have much understanding of the universe until you recognize its galaxies as important pieces. You cannot understand the modern city until you know that, although roads are physically inter-twined with the distribution of services, the two remain functionally distinct.

Scientists try to identify the components of existing structure. Designers try to shape the components of new structures. The search for the right components, and the right way to build form up from these components, is the greatest physical challenge faced by the designer. *I believe that if the hierarchical decomposition is intelligently used, it offers the key to this very basic problem—and will actually point to the major physical components of which the form should consist.*

When we consider the kinds of physical relationships which are likely to be suggested by sets of requirements, at first it seems that the nature of these relationships is very various. Some will define overall pattern properties of the form, like being circular, being low rather than high, being homogeneous. Others will be piece-like rather than pattern-like, that is they define pieces of which the whole form is made. Actually the distinction between pattern-like and piece-like relationships is more apparent than real.

This is the general rule. Every relational aspect of a form, whether piece-like or pattern-like, can be understood as a structure of components. Every form is a hierarchy of components, the large ones specifying the pattern of distribution of the smaller ones, the small ones, though at first sight more clearly piece-like, in fact again patterns specifying the arrangement and distribution of still smaller components.

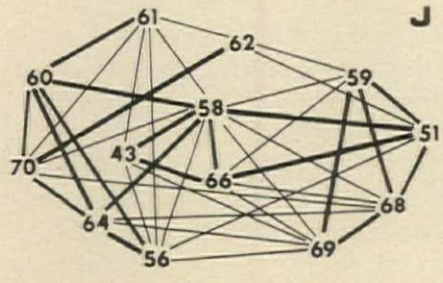
Every component has this twofold nature: it is first a unit, and second a pattern, both a pattern and a unit. Its nature as a unit makes it an entity distinct from its surroundings. Its nature as a pattern specifies the arrangement of its own component units. It is the culmination of the designer's task to make every physical relationship both a pattern and a unit. As a unit it will fit into the hierarchy of larger components that fall above it; as a pattern it will specify the hierarchy of smaller components which it itself is made of.

The hierarchical composition of these relationships will then lead to a physical object whose structural hierarchy is the exact counterpart of the functional hierarchy established during the analysis of the problem; as the program clarifies the component *sources* of the form's structure, so its realization, in parallel, will actually begin to define the form's *physical* components and their hierarchical organization.

This example, an analysis of a condominium, shows what happens when the theory explained on the foregoing pages is applied to an actual building program

According to the theory presented in this article, it is necessary to identify each of the components of a design problem, find their relationships to each other, and then arrange them into relatively independent sub-systems, if the problem is to be solved successfully. The following pages list 72 requirements for a condominium, taken from a master's thesis at the University of California by Donald M. Koenig. Below each fit, misfit requirement is a list of the other variables with which it interacts. The diagram shows the result of a mathematical analysis designed to separate the set of requirements into a heirarchy of sub-sets, each of which has the closest possible relationship within itself, and the least possible relationship to any of the other sub-sets. The numbers in the diagrams represent the requirements on the list. A diagram of a typical sub-set, J, is also shown.

A	B	C	D	E	F	G	H	I	J	K	L	M
44	4	1	12	17	29	30	34	38	43	7	11	11
45	5	2	13	20	31	31	55	40	51	8	23	50
46	10	3	14	21	32	33	56	41	56	9	51	53
47	12	6	15	24	35	34	57	42	58	11	53	65
48	13	10	16	42	39	36	58	43	59	15	58	66
	14	13	17	52		37	64	53	60	18	59	71
	16	25	19	54		38	69	56	61	51	65	
	17	26	20			64		66	62	59	66	
	20	27	22					69	64	66	67	
	22	28	49						66	68	68	
	44	49	68						68	69	69	
	46	63							69	72	72	
	48								70			
	49											



The mathematical basis of this analysis, and references to the computer programs required, will be found in appendix 2 of "Notes on the Synthesis of Form" by Christopher Alexander, pages 174-191

1. A new complex in an existing build up area should not violently upset or destroy the established urban pattern of that area.

1 interacts with 2, 3, 6, 8, 24, 25, 28, 43, 49.

2. A new complex should minimize the effect of zoning restrictions that dictate the form or surrender portions of available construction space through an arbitrary rule.

2 interacts with 1, 3, 5, 6, 10, 25, 26.

3. A new complex should not block natural light from the surrounding areas.

3 interacts with 1, 2, 6, 26, 27, 28.

4. No form of use should preclude future change.

4 interacts with 5, 7, 10, 12, 13, 16, 49, 71.

5. No part of the complex should be more "permanent" than it need be.

5 interacts with 2, 4, 10, 12, 13, 16, 22, 30, 44, 48.

6. Open space required to give light and to relieve the anxiety of overcrowding must not waste valuable land.

6 interacts with 1, 2, 3, 10, 13, 19, 25, 27, 28, 30, 63.

7. Owners should be able to feel independent and uncrowded, or to group together and interact socially; whichever they desire.

7 interacts with 4, 8, 9, 10, 15, 18, 50, 59, 62, 66, 72.

8. People wishing to identify themselves with a particular status level need a means of reinforcing this status identity.

8 interacts with 1, 7, 9, 15, 22, 24, 51, 62.

9. It should be possible to include a variety of "income-status" groups within the complex.

9 interacts with 7, 8, 10, 15, 18, 22, 59, 62, 66, 72.

10. The units available within the complex must not restrict the choice of different orientations, costs, sizes, shapes, locations, etc., that owners may desire.

10 interacts with 2, 4, 5, 6, 7, 9, 13, 26, 46, 49, 62, 63.

11. A dwelling unit should be effectively isolated from disturbing noises outside the unit boundaries.

11 interacts with 13, 14, 16, 18, 19, 23, 26, 50, 51, 59, 65, 69, 70, 71, 72.

The ultimate object of design is an enviroment . . .
which has no relationships in it that are not working to some specific purpose

12. Changes and additions made within a unit must not interfere with other units or common areas.
12 interacts with 4, 5, 13, 14, 15, 16, 20, 22, 42, 44, 48, 49, 53.

13. While the subdivision of units cannot be allowed, it should be possible to expand a unit after purchase.
13 interacts with 4, 5, 6, 10, 11, 12, 14, 17, 19, 20, 22, 25, 26, 43, 48, 49, 63, 68.

14. Unit ownership will include both the space enclosed and the enclosing materials and will exclude load-bearing structure common to other units and any exterior surfaces not considered acceptable for individual ownership.
14 interacts with 11, 12, 13, 16, 17, 19, 20, 22, 25, 44, 49, 54, 68.

15. An owner should be able to express his status or individuality without discomforting other owners.
15 interacts with 7, 8, 9, 12, 16, 20, 21, 22, 24, 33, 52, 66, 68.

16. An owner should have substantial control of the interior physical characteristics of his unit without affecting other owners or units.
16 interacts with 4, 5, 11, 12, 14, 15, 17, 22, 46, 48, 49, 68.

17. An owner should feel that his unit is a physically tangible object of ownership.
17 interacts with 13, 14, 16, 19, 20, 21, 49, 51, 54, 68.

18. An owner should be able to use his own unit as he wishes without bothering other owners.
18 interacts with 7, 9, 11, 59, 72.

19. An owner should have a sense of ownership of his "own piece of sky," "roof over his head," etc.
19 interacts with 6, 11, 13, 14, 17, 20, 49.

20. An owner should have as much control as possible over the exterior appearance of his unit so long as it does not offend other owners or threaten their property values.
20 interacts with 12, 13, 14, 15, 17, 19, 21, 22, 24, 25, 49, 52, 54, 67, 68.

21. If a unit is poorly maintained, this should not affect the value or use of other units in the complex.
21 interacts with 15, 17, 20, 24, 42, 45, 52, 54.

22. An owner should be able to increase the market value of his unit if he desires without adversely affecting other owners or units.
22 interacts with 5, 8, 9, 12, 13, 14, 15, 16, 20.

23. Activities within the unit should not be seen or heard by others unless the owner wishes it.
23 interacts with 11, 24, 51, 58, 66, 68.

24. Activities in an area should not lessen the value or desirability of areas visually adjacent.
24 interacts with 1, 8, 15, 20, 21, 23, 27, 42.

25. The quality and quantity of light desired in a unit should not be dictated by physical characteristics outside the unit over which the owner has no control.
25 interacts with 1, 2, 6, 13, 14, 20, 27, 49, 53.

26. There should be as few spaces as possible within the unit that have no access to natural light and air.
26 interacts with 2, 3, 10, 11, 13, 49.

27. A unit should have a "view" without the nuisance of direct sun glare.
27 interacts with 3, 6, 24, 25.

28. The attempt to provide new space for automobiles in high density areas should not take so much space that it increases the distance between the urban elements served.
28 interacts with 1, 3, 6, 29, 30, 31, 33, 49.

29. Space allocated to one type of parking (e.g., public, private, visitor, etc.) must not remain vacant when another type of parking requires additional space.
29 interacts with 28, 31, 32, 35, 41.

30. Automobiles need to be located in space that cannot be occupied more efficiently or economically by some other use.
30 interacts with 5, 6, 28, 33, 34, 36, 38, 39, 40, 41, 49.

31. The volume of parking space required per automobile in a parking facility should be minimal.
31 interacts with 28, 32, 33, 34, 36, 38, 41.

32. There must be covered parking space available for one automobile per unit plus additional spaces as required by any commercial units.
32 interacts with 29, 31, 35, 39, 49.

33. An owner should be able to leave his car as close to his unit as possible.
33 interacts with 15, 28, 30, 31, 34, 36, 37, 38, 39, 64.

34. A person using commercial parking facilities should be able to leave his car close to the street and as close to the commercial units as possible.
34 interacts with 30, 31, 33, 36, 37, 38, 56, 57, 58.

35. Commercial or public parking should not usurp necessary private parking spaces.
35 interacts with 29, 32, 39, 53, 58.

36. A driver should be able to enter and leave a parking space without wasting time and effort.
36 interacts with 30, 31, 33, 34, 37, 38, 53, 64.

37. Parking should not confuse or disorient a person.
37 interacts with 33, 34, 36, 38, 64.

38. Drivers should be able to discharge and pick up passengers near normal pedestrian access ways without interfering with normal pedestrian or vehicular traffic.
38 interacts with 30, 31, 33, 34, 36, 37, 42, 53, 56, 64, 65.

39. Parked cars should be secure from tampering or theft.
39 interacts with 30, 32, 33, 35, 51, 56, 60.

40. Service vehicles require easy access from the street to pickup and delivery points in the complex.
40 interacts with 30, 41, 42, 43, 69.

41. Service vehicles may be required to park temporarily.
41 interacts with 29, 30, 31, 40, 42, 43.

42. Access to units for trash, delivery, service, etc., should be possible without interfering with normal pedestrian access.
42 interacts with 12, 21, 24, 38, 40, 41, 43, 44, 52, 53, 69.

43. The necessity for rights to an easement should be avoided if the purpose for which it is normally granted can be accomplished without using an easement.
43 interacts with 1, 13, 40, 41, 42, 44, 45, 53, 56, 58, 61, 66, 69.

44. Utilities need to be easily accessible for repairs, additions, alterations, etc., but should not be visual or physical obstacles.
44 interacts with 5, 12, 14, 42, 43, 45, 46, 47, 48, 71.

The crucial quality of shape, no matter of what kind,
lies in its organization,
and when we think of it this way we call it form

45. Utility systems should not function in such a way that malfunction or repair in one unit will interfere with other units.

45 interacts with 21, 43, 44, 47, 52, 54.

46. Each unit plumbing system should be easily and economically connected to common plumbing.

46 interacts with 10, 16, 44, 47, 48, 49, 50, 63.

47. No utility system should contain expensive duplication of material or service.

47 interacts with 44, 45, 46, 48, 50.

48. The plumbing system should not excessively limit the range of possible fixture locations within the unit.

48 interacts with 5, 12, 13, 16, 44, 46, 47, 49, 50.

49. Commonly owned load-bearing structural members must not restrict the use of areas in which they are located.

49 interacts with 1, 4, 10, 12, 13, 14, 16, 17, 19, 20, 25, 26, 28, 30, 32, 46, 48, 69, 71.

50. The initial cost and the cost of maintaining common areas from which any owner does not benefit should be minimal.

50 interacts with 7, 11, 46, 47, 48, 52, 53, 62, 63, 66, 68, 71.

51. It should be easy to distinguish common areas from individually owned areas.

51 interacts with 8, 11, 17, 23, 39, 56, 58, 59, 62, 66, 67, 68, 72.

52. An owner should not be able to seriously impair the proper maintenance of common areas.

52 interacts with 15, 20, 21, 42, 45, 50, 53, 54, 72.

53. An owner should not be able to obstruct the use of any common areas.

53 interacts with 12, 25, 35, 36, 38, 42, 43, 50, 52.

54. Owners should be free of any unnecessary maintenance worries.

54 interacts with 14, 17, 20, 21, 45, 52, 68.

55. Use of commercial units should not interfere with the use of dwelling units.

55 interacts with 56, 57, 58, 64.

56. Use of commercial units should not interfere with common areas intended solely for use by dwelling units.

56 interacts with 34, 38, 39, 43, 51, 55, 57, 58, 60, 61, 64, 69.

57. Commercial units should be oriented for public use as well as for use by other owners in the complex.

57 interacts with 34, 55, 56, 64, 69.

58. The public should not be able to encroach on an individual owner's domain except when specifically visiting him.

58 interacts with 23, 34, 35, 43, 51, 55, 56, 59, 60, 61, 64, 66, 68, 69, 70.

59. The use of common and individually owned areas should not be allowed to conflict.

59 interacts with 7, 9, 11, 18, 51, 58, 62, 65, 66, 68, 69, 72.

60. The public should not be able to reach private common areas.

60 interacts with 39, 56, 58, 61, 64, 70.

61. The privacy of private common areas must not be disturbed by activity in public areas.

61 interacts with 43, 56, 58, 60, 62, 70.

62. Private common areas should be equally accessible to all unit owners and should not favor use by only some owners because of location.

62 interacts with 7, 8, 9, 10, 50, 51, 59, 61, 70.

63. Amenities or lack of amenities should not be unfairly apportioned, because of location, to units that are otherwise similar.

63 interacts with 6, 10, 13, 46, 50.

64. Access routes to dwelling units should be convenient for owners but should discourage public use.

64 interacts with 33, 36, 37, 38, 55, 56, 57, 60, 68, 69, 70, 71.

65. All accesses should allow safe and non-disturbing use by children.

65 interacts with 11, 38, 59, 66, 70, 71, 72.

66. No owner going to and from his unit should feel that he is encroaching on a second owner's domain; nor should the second owner feel that his domain is being encroached on by the first.

66 interacts with 7, 9, 15, 23, 43, 50, 51, 58, 59, 65, 67, 68, 69, 72.

67. An owner should feel a "sense of arrival" prior to entering his unit.

67 interacts with 20, 51, 66, 68.

68. An owner should have ownership or control of some part of the domain that extends outside his door.

68 interacts with 13, 14, 15, 16, 17, 20, 23, 50, 51, 54, 58, 59, 64, 66, 67, 69, 70.

69. Elevators should be easily accessible to units but the operation of an elevator should not infringe on an owner's domain when he is not using the elevator.

69 interacts with 11, 40, 42, 43, 49, 56, 57, 58, 59, 64, 66, 68, 72.

70. It must be possible to reach private common areas from the unit without going on paths also open to the public.

70 interacts with 11, 58, 60, 61, 62, 64, 65, 68.

71. Every floor used for dwelling units must have two separate fire exit ways and each unit must have at least one path to an exitway that cannot reasonably be blocked by fire.

71 interacts with 4, 11, 44, 49, 50, 64, 65.

72. The implementation of any social rules, sanctions, or safeguards created to preserve harmony among the condominium owners, must not be made difficult by the physical form of the complex.

72 interacts with 7, 9, 11, 18, 51, 52, 59, 65, 66, 69.

Harr, Hedrich-Blessing photos

MAXIMUM SECURITY PRISON THAT EMPHASIZES REHABILITATION

United States Penitentiary
Marion, Illinois

ARCHITECTS:
Hellmuth, Obata, & Kassabaum, Inc.
Gyo Obata, partner in charge of design

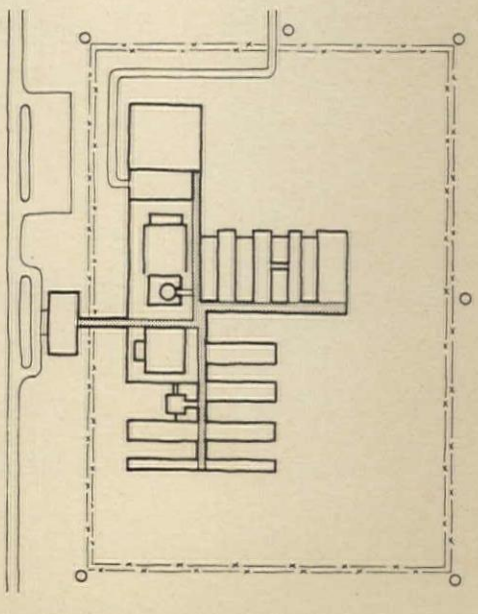
CONSULTANT:
George W. Aderhold

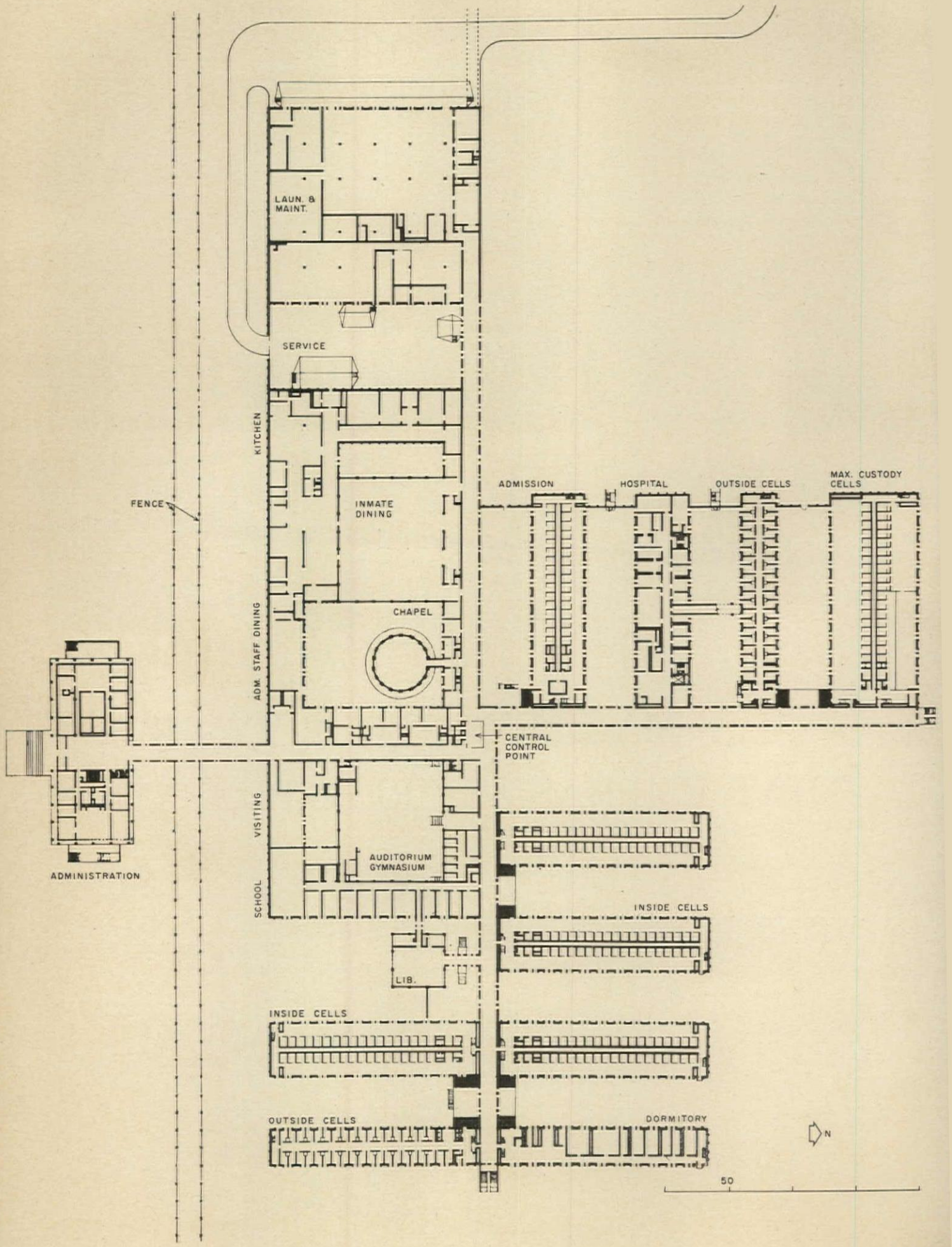
STRUCTURAL ENGINEER:
Eugene Dubin

MECHANICAL ENGINEERS:
Engineers Collaborative, Inc.

CIVIL ENGINEERS:
Horner and Shifrin

GENERAL CONTRACTOR:
Blount Brothers Construction Co.




LAUN. & MAINT.
SERVICE
KITCHEN
FENCE
INMATE DINING
CHAPEL
ADM. STAFF DINING
ADMISSION
HOSPITAL
OUTSIDE CELLS
MAX. CUSTODY CELLS
CENTRAL CONTROL POINT
ADMINISTRATION
VISITING
SCHOOL
AUDITORIUM GYMNASIUM
INSIDE CELLS
LIB.
INSIDE CELLS
OUTSIDE CELLS
DORMITORY
N
50

The new Federal penitentiary at Marion, Illinois, is a maximum security institution like Leavenworth and Alcatraz. Unlike its earlier counterparts, however, its design does not express only the hopelessness of trying to escape. Instead, it seeks to create an atmosphere conducive to the rehabilitation of the inmates. Designed by Gyo Obata of Hellmuth, Obata, and Kassabaum, in close consultation with the Federal Bureau of Prisons, the Marion buildings are a showcase of the most modern correctional practice.

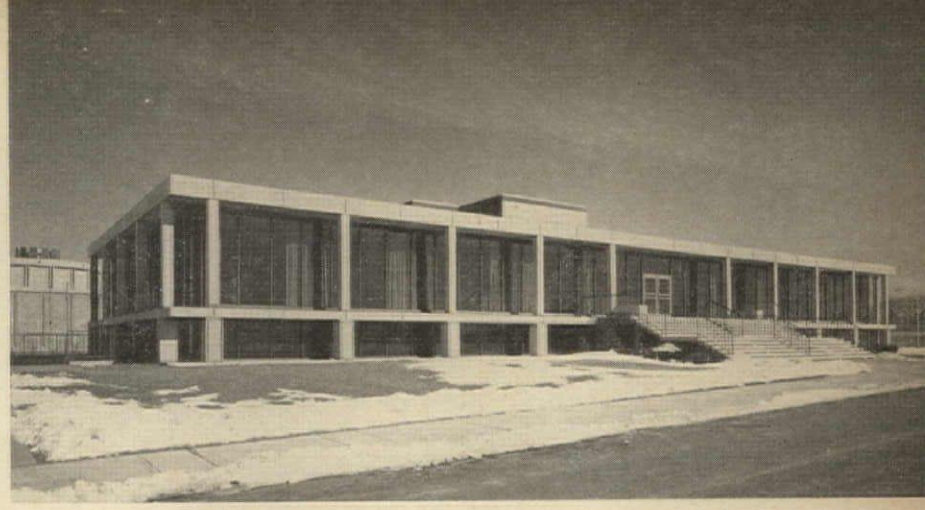
Security

The traditional massive and forbidding prison wall is now, in any case, an expensive anachronism. The modern electronic techniques in use at Marion are much simpler and at least as effective. The prison is surrounded by a double fence topped with barbed wire. The fence area is kept under constant observation from watch towers situated outside the enclosure. The guards have a 360 degree view and can push back glass panels to shoot, if necessary. Even so, the fence still permits some visual continuity with the pleasant scenery of the wildlife sanctuary around the prison.

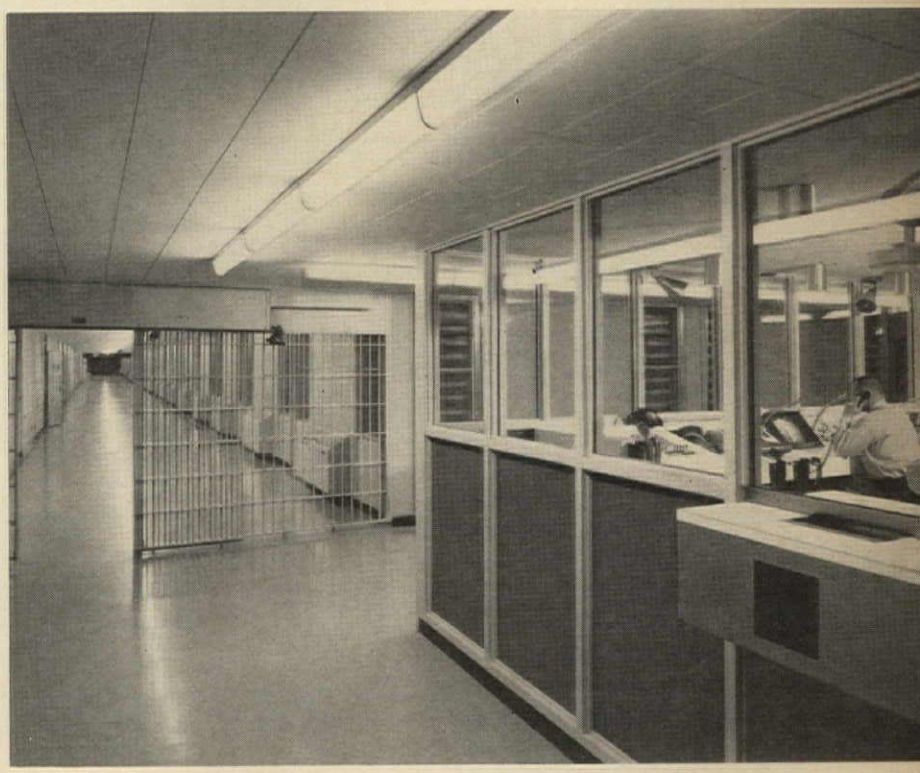
The internal security arrangements make extensive use of closed-circuit television. The administration building is situated just outside the enclosure, and the gates between it and the prison are operated through a remote control system by a guard watching a T.V. screen in a roof-top booth. A second control booth is placed at the intersection of the four major corridors of the prison, where a single guard, his vision supplemented by the T.V. camera, can have a very good idea of what is happening all over the institution.

Basic Organization

The four corridors extending in pinwheel fashion from a central control point can be said to form the basic organization of the prison complex. Its various elements are disposed

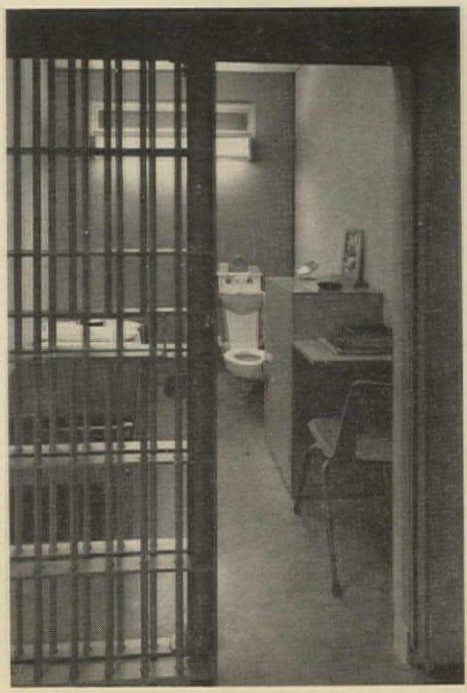


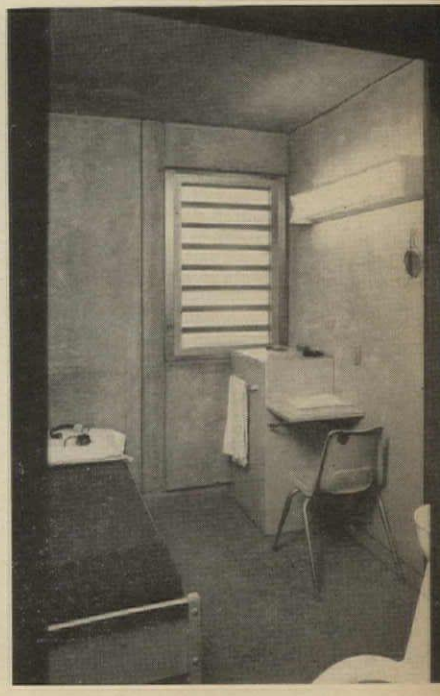
Administration building is outside the fence

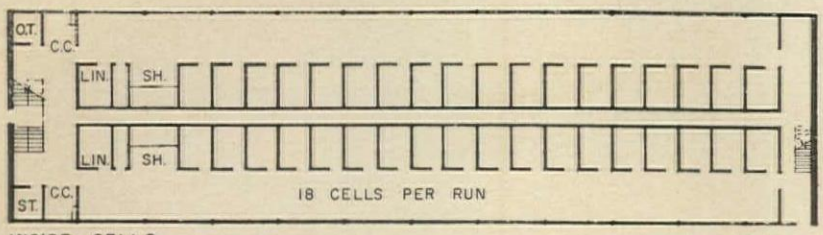


Control point at intersection of four main corridors

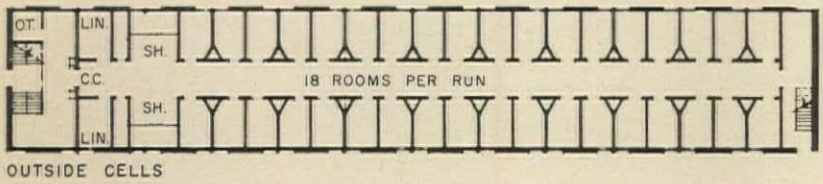
Typical cells: (*left*) interior cell; (*right*) exterior cell



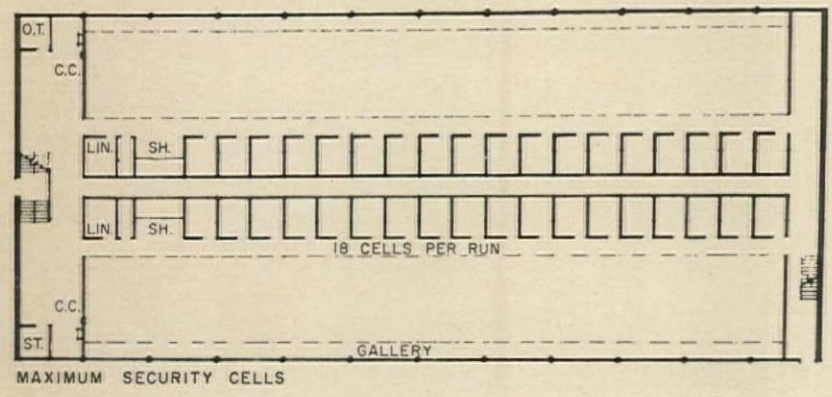




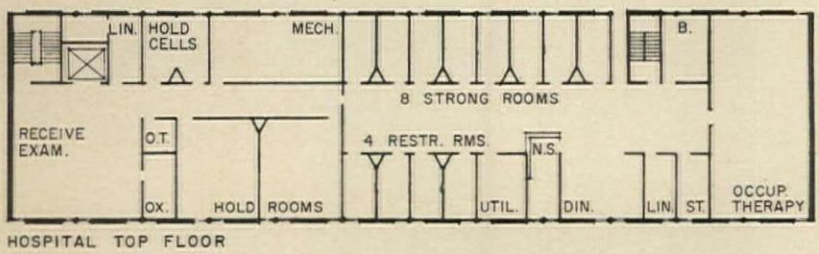
INSIDE CELLS



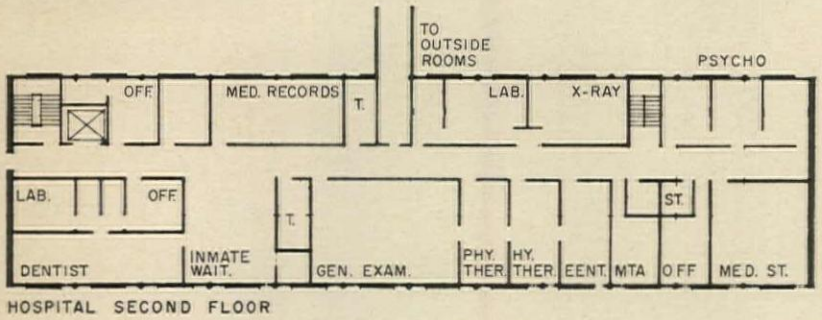
OUTSIDE CELLS



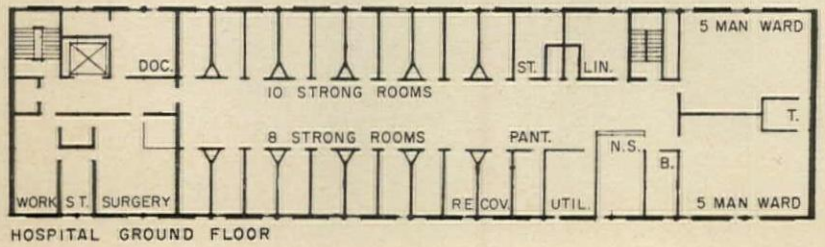
MAXIMUM SECURITY CELLS



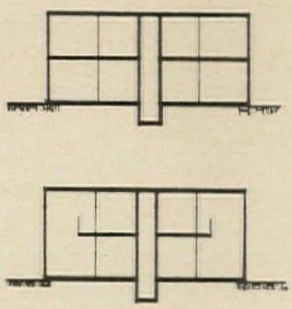
HOSPITAL TOP FLOOR

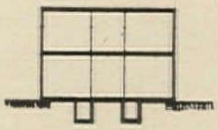


HOSPITAL SECOND FLOOR

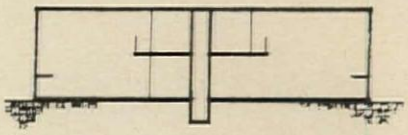


HOSPITAL GROUND FLOOR

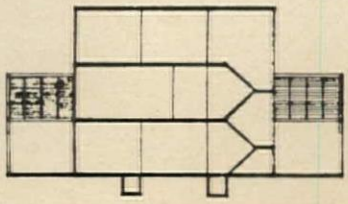




Above: Some blocks of inside cells are divided by full second floor, others are double height. All outside cells have corridor access.
Below: Maximum security cells have two-story open area with additional gallery along outside wall



The hospital provides for different types of physical and psychiatric illness and differing security requirements. A bridge at the second story level connects to a block of outside cells, which can be used as additional hospital accommodation



along the corridors in a modified version of the telephone pole plan, so named because major areas branch off at right angles to main corridors. The pin-wheel configuration overcomes one of the basic objections to telephone pole plans—excessive length. In one institution, built not so long ago, the personnel must ride bicycles to get from one end of the building to the other.

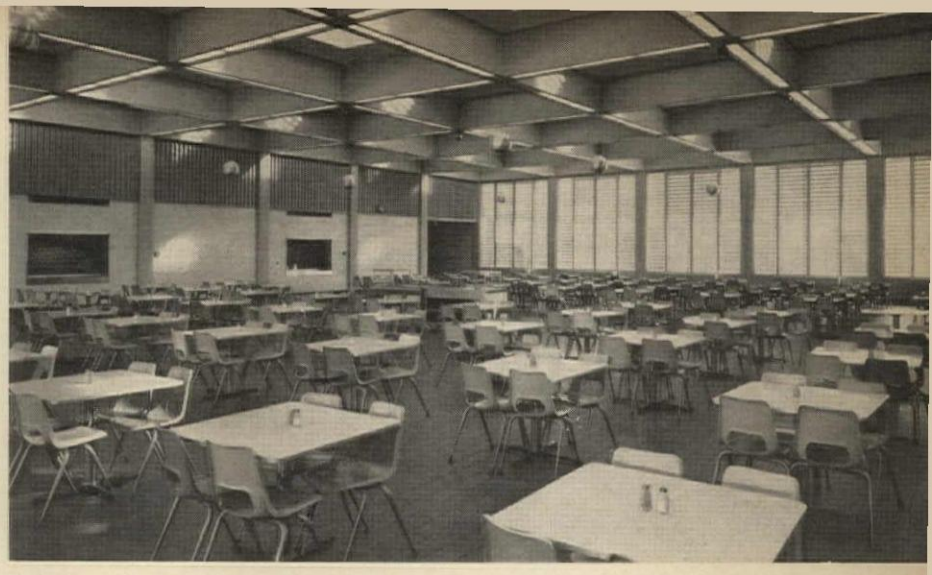
The Prisoners

The inmates at Marion are, generally speaking, young men between the ages of 21 and 30 whose behavior is seriously anti-social or disturbed. The inmate may be unwilling, or unable, to accept the reality of a long-term sentence and be constantly plotting to escape, or he may be an aggressive or predatory individual who is a potentially disruptive force. Many will require psychiatric treatment.

The prisoners are housed in individual cells which, following recent practice, are arranged in small, self-contained groups. There are several different types of cell-blocks, giving the prison administration considerable flexibility of approach. The windows of the outside cells incorporate the bars in such a way that they are practically invisible. Furnishings are plain, but sufficient to preserve a decent measure of self-respect. Many a student has spent a year in surroundings scarcely less penitential.

Rehabilitation

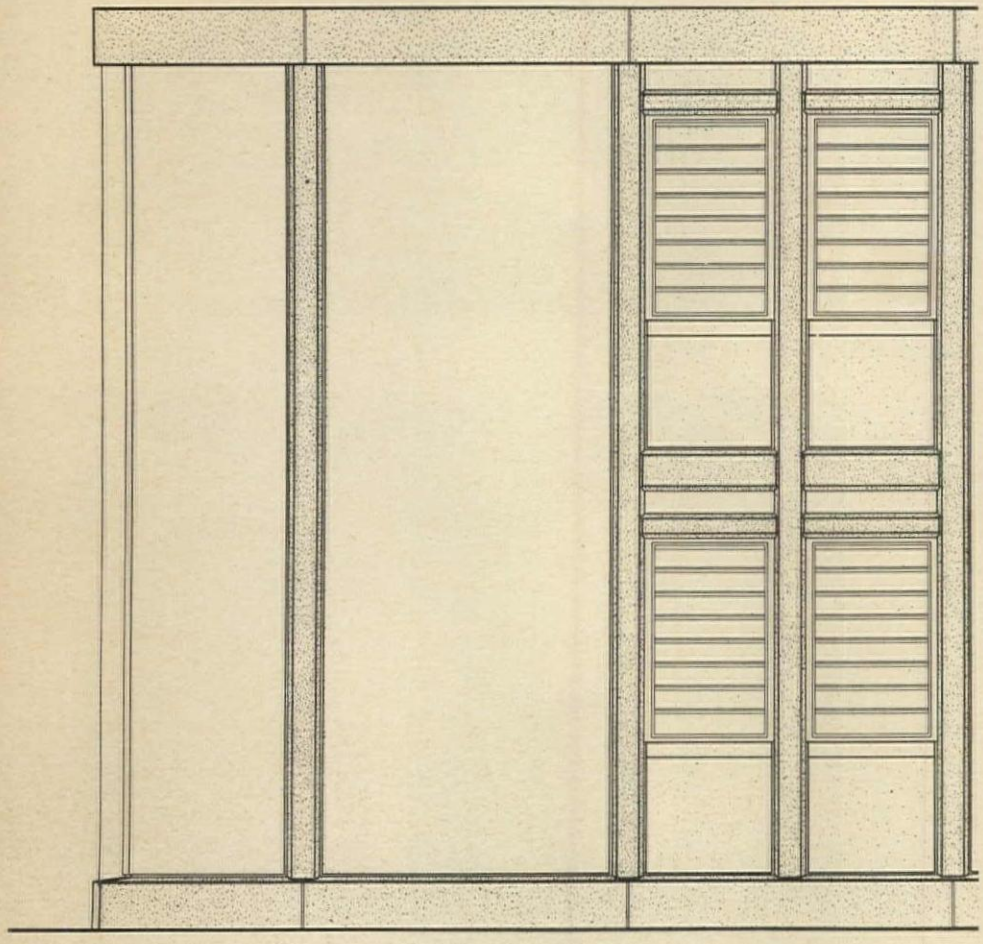
The analogy to a school is a useful one, because Marion is an educational institution in many respects. Its basic purpose is to retrain the inmates to live within the requirements of society; and, at the present time, Marion is also being used to train prison service personnel in the latest correctional techniques. The Marion location was dictated in part by the proximity of the University of Southern Illinois, and the prison classrooms, cafeteria, library, and chapel have been given a character expressive of this educational role.

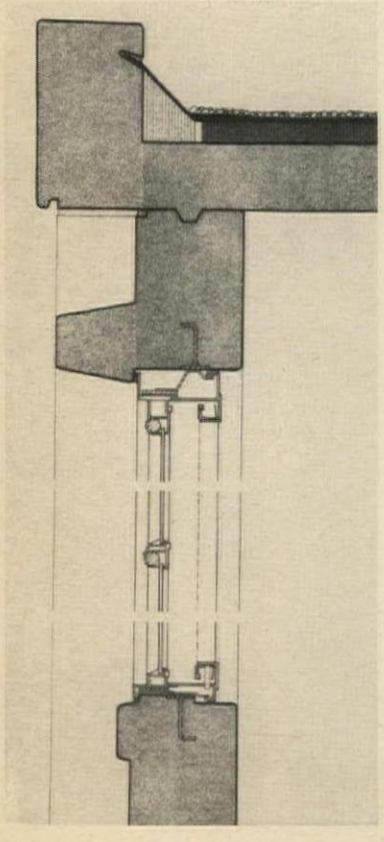


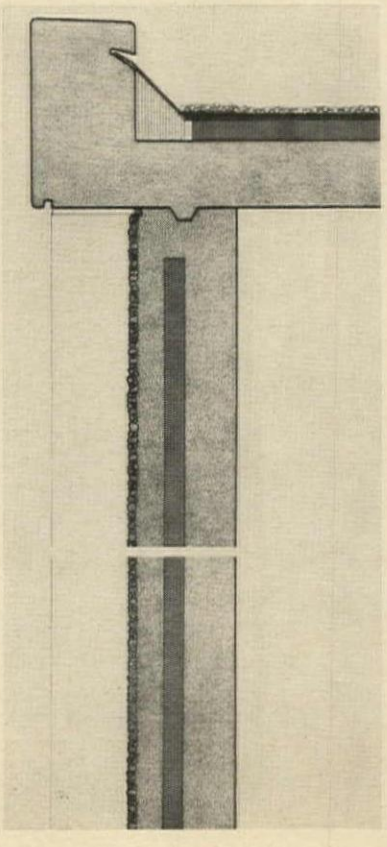
Interior of cafeteria

Interior of library

The chapel







The Marion prison is constructed of precast concrete panels as shown in the partial elevation (*above*). The section (*far left*) of a window panel shows how bars are incorporated unobtrusively. The section of a solid panel (*left*) shows the special security reinforcing. All panels are welded in place

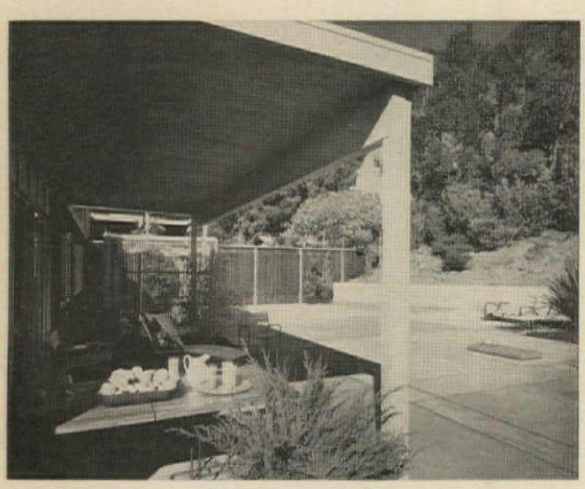
Morley Baer photos

PRIVACY AND OUTDOOR LIVING ON TINY LOT

Campbell and Wong use variation in roof height to give scale and spatial interest to the scheme

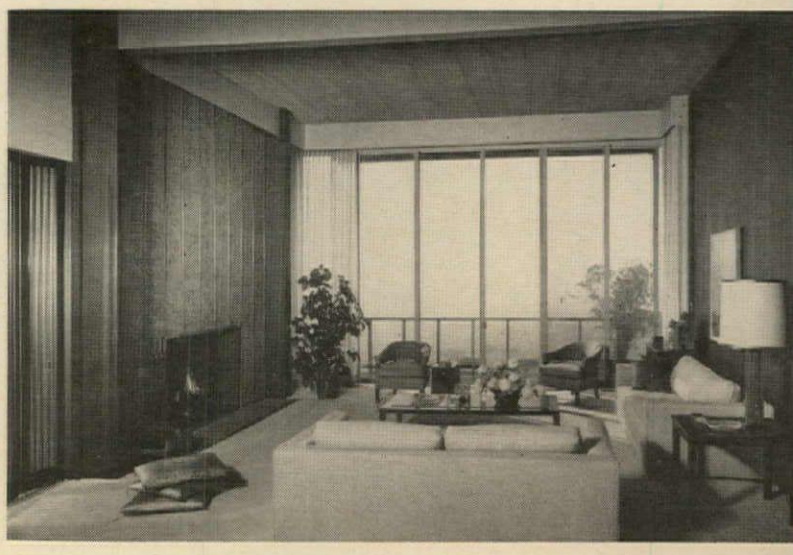
The chief advantage of this hillside lot is a magnificent view of the San Francisco Bay Area. Apart from this, the site was not an easy one because of its steep slope and the close proximity of neighboring houses. The architects succeeded in taking full advantage of the view and at the same time provided considerable privacy for the client, his wife and three small children, by orienting all the major living spaces to the view and away from the street. Thus family and living rooms and four of the five bedrooms overlook the bay, and service and circulation areas are placed on the street side.

The family room is the only one which penetrates the full depth of the house giving on to a wooden deck at the front and a covered court at the back. The wooden deck, which extends the whole length of the front of the house, allows ample opportunity for outdoor living and substantially extends the entertaining area.

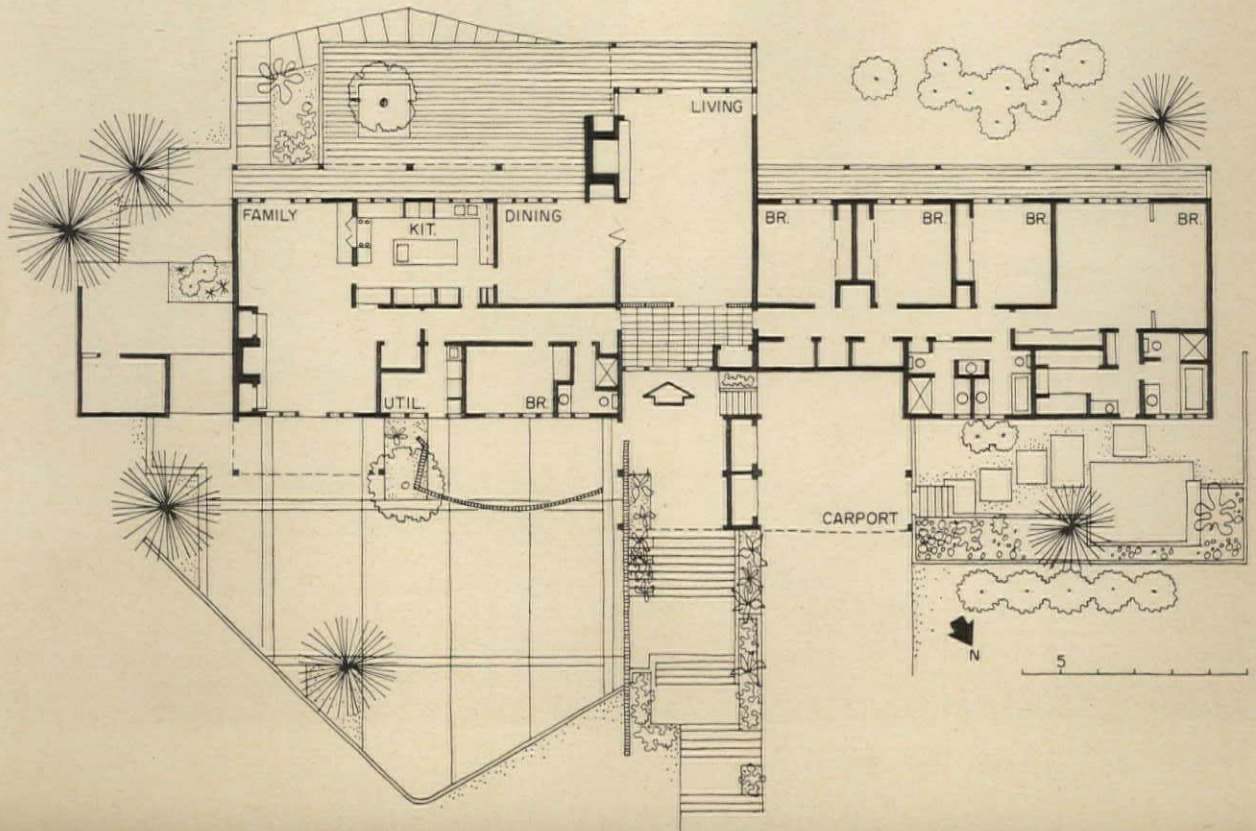


The variation in ceiling height creates spatial interest inside the house. The living room, family room and master bedroom all have high ceilings which give them an air of formal elegance. A striking feature of the interior is the contrast between dark brown tongued and grooved mahogany walls and light yellowish brown Douglas fir ceilings. The furnishings in the living room are predominantly off-white and blue-gray, with a few dark wood pieces taking up the color of the walls.

The structure is Douglas fir frame on a continuous reinforced concrete footing. Exterior walls are tongued and grooved redwood, stained dark brown; the roof is five-ply tar and gravel. The house is heated by forced hot air with gas-burning furnaces.



Private residence, El Cerrito, California
ARCHITECTS: *Campbell & Wong & Associates*
CONTRACTOR: *Allan Sergeant*
LANDSCAPE ARCHITECT: *Robert Royston*
INTERIOR DESIGNER: *Eleanor Forbes*


LIVING
FAMILY
KIT.
DINING
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UTIL.
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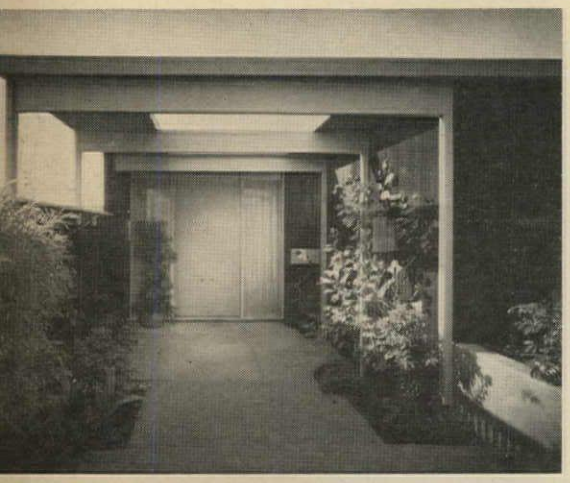
5



The plan has been carefully organized to provide large, open living spaces, but at the same time to give scope for individual activities and quiet in the sleeping areas. There are several small seating alcoves which can be used for telephoning, reading or letter writing, and each of the children's bedrooms has a built in ledge along the window for homework, hobbies, etc. Evidence of careful planning is seen in the position of the main entry at the central point in the plan with easy access to all parts of the house, including the carport. Each room has an adjacent outdoor living area

APARTMENTS

A Report on Architecture for Living

The 10 projects in this 24-page study were chosen because they present an attractive face to their community or countryside—an undeniable virtue, and not one common to apartment buildings in general. However, there is nothing new about their interior spatial arrangements; life here is organized on the familiar biological basis, with space boxes for "living," eating, cooking, bathing, sleeping, etc. These quarters—as good as you will find in 1965—bear a remarkable resemblance to the best of 50 years ago, discounting the shiny bathroom and kitchen equipment and the "modern" architecture. Americans are accustomed to the familiar rooms in the familiar pattern, and, provided they are spacious and arranged for privacy, have become comfortable in them. This applies whether the building is a tower or town house—a duplex or detached dwelling. There are many who feel that costs are too high, either to rent or to buy. But new designs for living spaces will hardly answer this complaint; only a radical new building technology might.

Yet there is design progress to be made. Apartment buildings—with very few exceptions—continue to be multi-story slab structures with applied skins. Continuity of structure and skin, when brought to bear on the tall apartment building, will offer substantial benefits in column-less, bay-free space. There will be benefits, too, when lighting and air conditioning become a part of the fabric of the building, and not an added element. When matters such as these, and others of a similar nature, are dealt with creatively, then substantial progress will be made toward the apartment building of the future. And it might cost less!

—James S. Hornbeck

Morley Baer photos

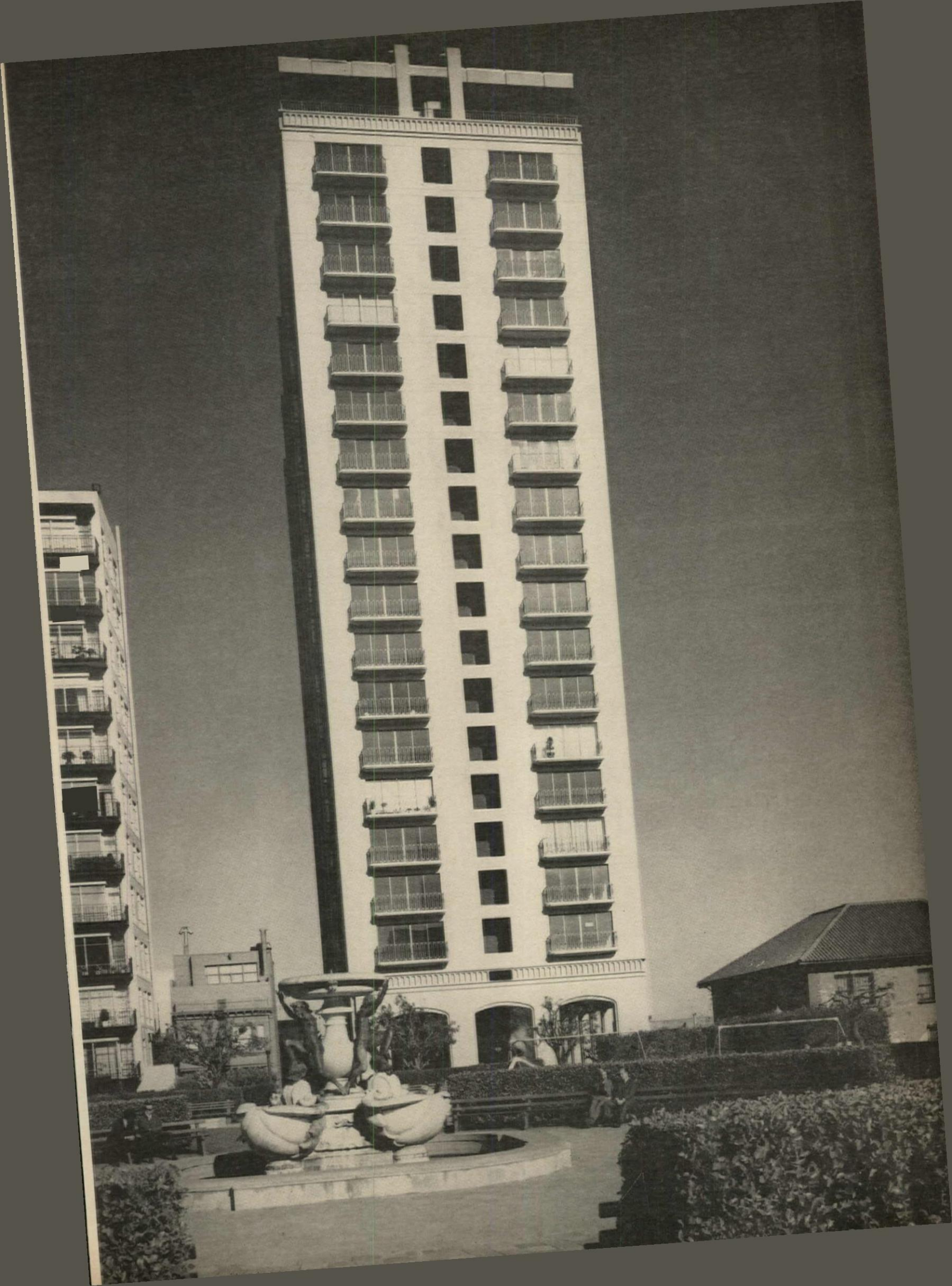
NOB HILL ELEGANCE BY WARNECKE

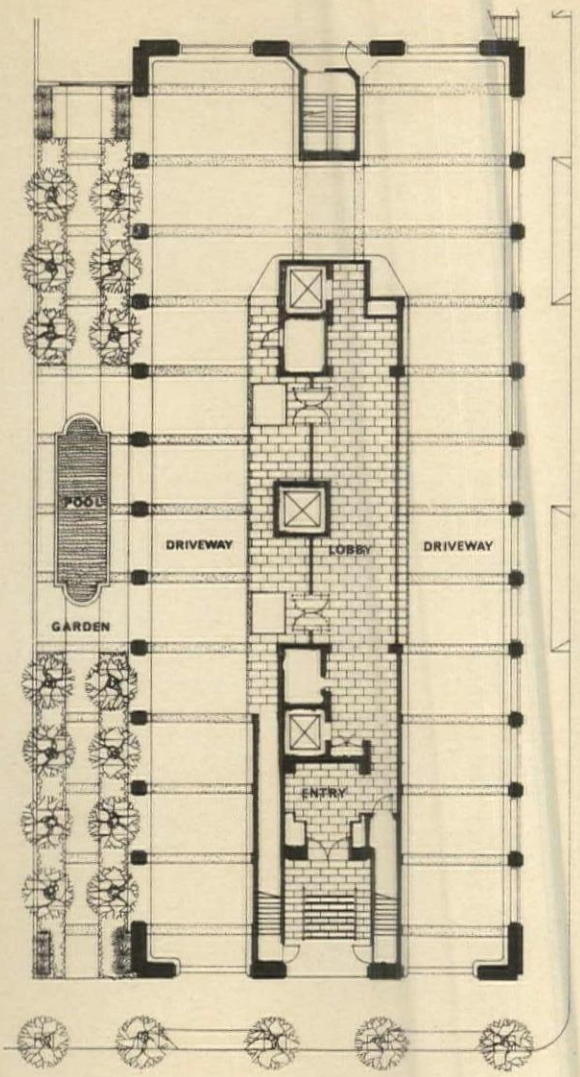
In designing this luxury condominium on San Francisco's Nob Hill, architect John Carl Warnecke's aim was to provide a contemporary apartment building appropriate to the character of the neighborhood. The new structure, on Sacramento Street, faces Huntington Park and lies diagonally across from the Pacific Union Club, while Grace Cathedral and the Fairmont and Mark Hopkins hotels are nearby. The arched lower floor, refinement of detail, design of balconies and bay windows, colors and materials selected—the whole mood of the building is such that it fits into the Nob Hill scene gracefully without compromising its modernity.

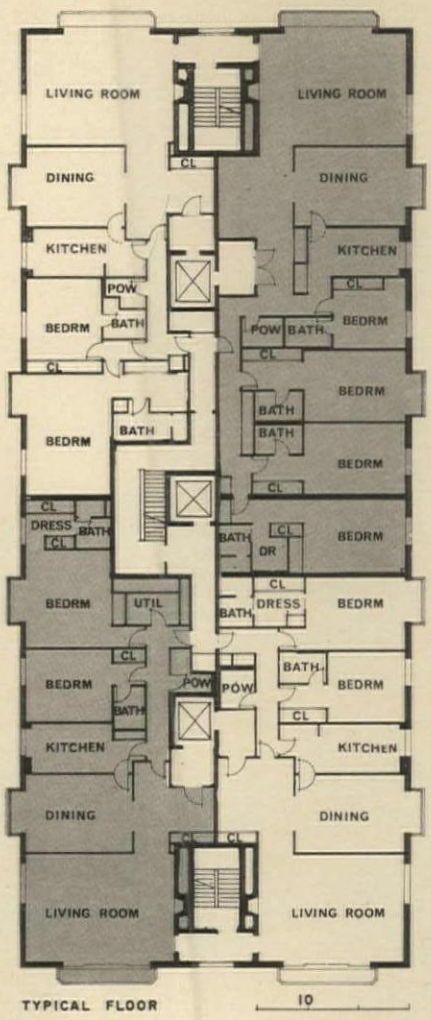
Architect Warnecke explains: "The structure is a concrete frame with prestressed concrete floor slabs. The concrete, exposed on the exterior, is bush-hammered at the public lobby level and painted a light beige color above. In form, the building is a 22-story rectangular tower with arched openings at ground level, and with balconies and bay windows serving to soften the shape of the rectangle above.

"There are four apartments per floor, all with panoramic views and unusual amenities. Most apartments have fireplaces; ceilings are 9 feet; all living rooms are located at corners; each apartment has a private elevator lobby and service lobby; apartments are designed for privacy and sound isolation. There are a total of 68 apartments."

The Nob Hill, San Francisco, California. Architects: John Carl Warnecke and Associates; structural engineers: T. Y. Lin and Associates; mechanical engineer: Alexander Boome; landscape architects: John Carl Warnecke and Associates, Michael Painter, ASLA; owner and general contractor: Haas and Haynie

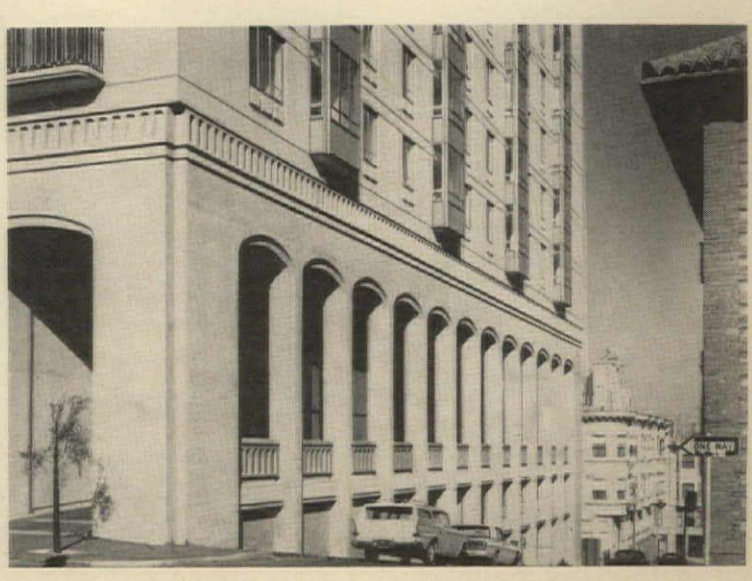


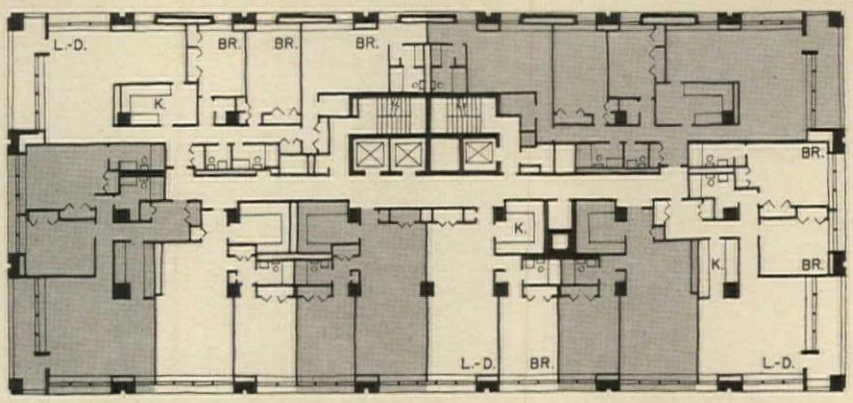




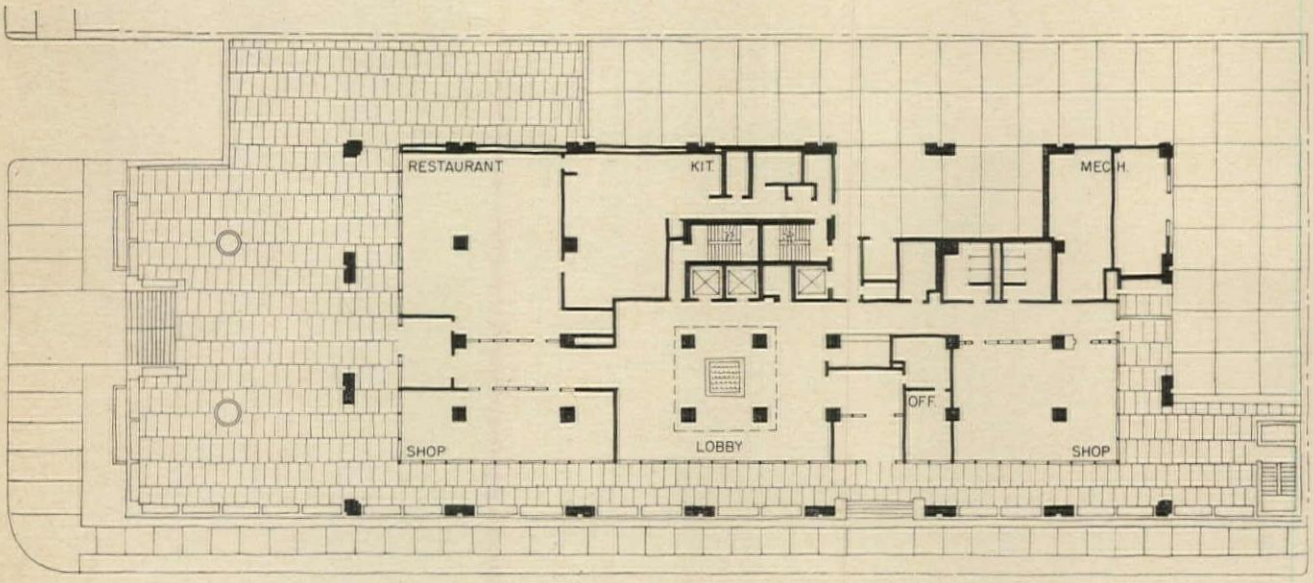
The lobby floor of the building is a latter-day *porte-cochere* consisting of an island surrounded by an automobile entrance and exit. This island, rectangular in shape, houses a lounge, administrative office, mail boxes, passenger elevators and attendant's office. A protected platform adjoins the lounge and serves as a portal for tenants and guests who are arriving or departing by car. The large photo of the lounge, at right, points up the general air of luxury that has been achieved. The U-shaped driveway can park 15 cars temporarily, in addition to providing through passage.

There are two apartment types on the typical floors: a two-bedroom unit and a four-bedroom unit. In the latter, one of the bedrooms can be used as a maid's room. The basic units are designed so that two can be combined to provide a single unit extending through either the length or the width of the building. Each apartment unit is larger than many houses; floor areas per tenant range from 2,000 to 2,900 square feet. The design takes advantage of the sloping site—which falls off 20 feet—to provide a three-level enclosed garage for 115 cars, plus storage, laundry and utility areas





TYPICAL FLOOR



ARCADED HIGH-RISE ON A RAISED PLAZA

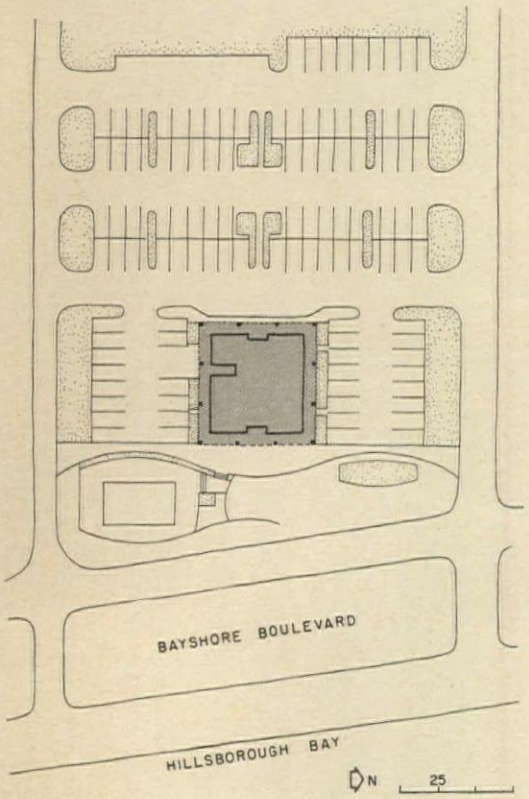
In describing the design of Lindell Terrace, St. Louis high-rise apartment, architect Gyo Obata says: "This is a reinforced concrete structure on a very limited site in the center of St. Louis, near the Chase-Park Plaza Hotel. Because of the small site, two levels of parking were placed below grade and the mechanical rooms were located on a mezzanine level directly above the lobby. As a result, we get a two-story arcade on three sides of the building, and give the tower further distinction by placing it on a raised plaza. The plaza becomes the lobby level; serves to give the lobby and rental areas a special character.

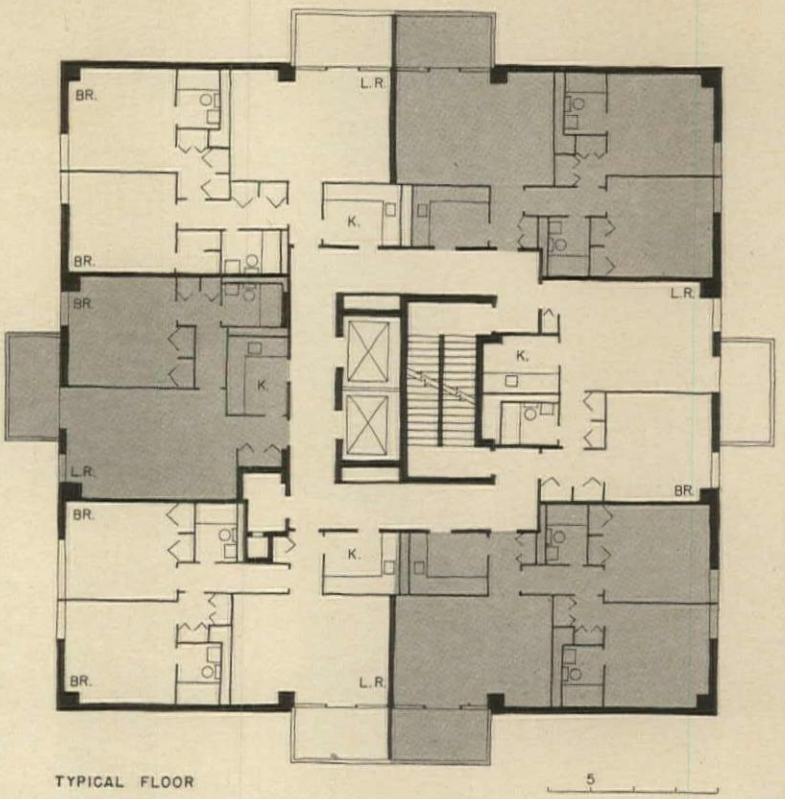
"Lindell Terrace is a luxury apartment house with one-, two- and three-bedroom living units. Larger apartments are placed at the corners so they can have outdoor terraces within the frame of the building; a scheme that provides maximum privacy. The gray glass windows are deeply inset for sun protection. The exterior thus becomes the expression of a concrete frame with deep shadows."

The building is fully air-conditioned, making use of a dual system of perimeter units with individual room controls, plus a central fresh air system serving each apartment. Particular care was taken to make each living unit as soundproof as possible, by location and by special details and materials.

Lindell Terrace, St. Louis, Missouri. Architects: Hellmuth, Obata & Kassabaum—Charles Dana, project architect; structural engineer: Albert Alper; mechanical engineer: Harold P. Brehm; electrical engineer: Donald K. Ross; food service consultants: Flambert & Flambert; contractor: Fruin-Colnun.

Balthazar





APARTMENT TOWER WITH TWO-STORY BASE

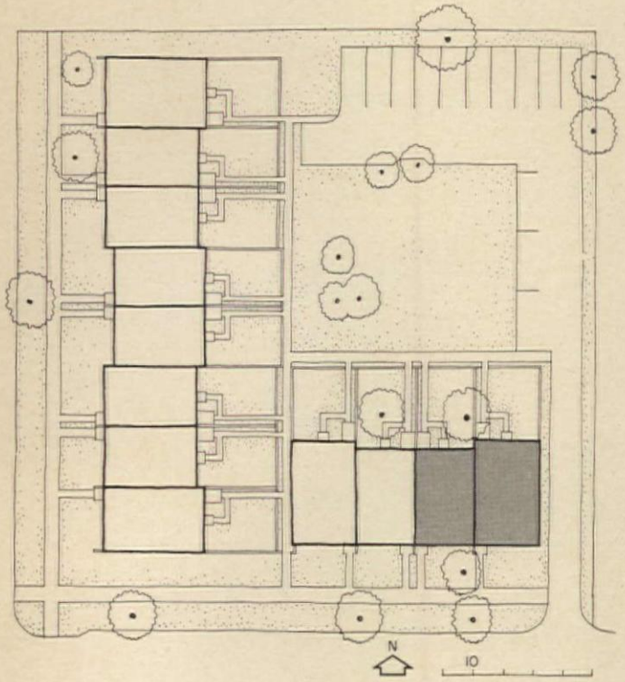
This 15-story apartment house in Tampa—square in plan—is considerably enhanced by the 16-foot-high concrete base upon which it rests, and by the well proportioned concrete element that caps it. Of interest also is the manner in which the individual air-conditioning units—too often an eye-sore—have been brought under visual control by sinking them flush into precast panels. This device renders them relatively unobtrusive and organizes the pattern they make. The cantilevered balconies have balustrades of perforated tile for the benefit of acrophobiacs; the balconies find considerable use, since the building is located on a particularly appealing stretch of bay front.

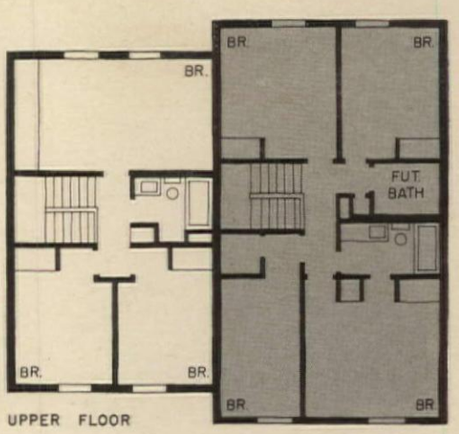
Each tenant is billed for his own electricity, which heats the water, runs the air-conditioning units, and serves for general light and power. Architect Richard Aeck reports that it usually takes one month of occupancy to teach tenants that if they close the windows, watch the lights and run the air-conditioners only when needed, their charges for electricity will run between $7 and $9 per month, exactly as the power company had predicted.

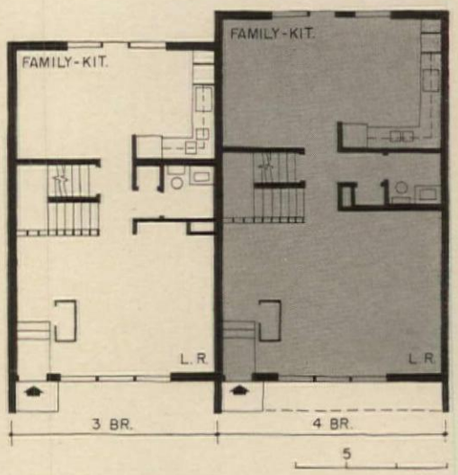
The structure of the building is of reinforced concrete, and its foundations rest on concrete piles. Interior walls are soundproofed between apartments and against corridors; partitions are of dry-wall construction. Covered parking, screened by planting, is provided in the ratio of one and one-half cars per apartment.

Bayshore Towers, Tampa, Florida. Architects: Aeck Associates; structural engineers: Chastain & Tindel; mechanical engineers: McLendon & Holbrook; electrical engineers: Bush, May & Williams; general contractor: Frank J. Rooney, Inc.

Alexandre Georges photos







BUYERS PREFER FOUR-BEDROOM TOWN HOUSES

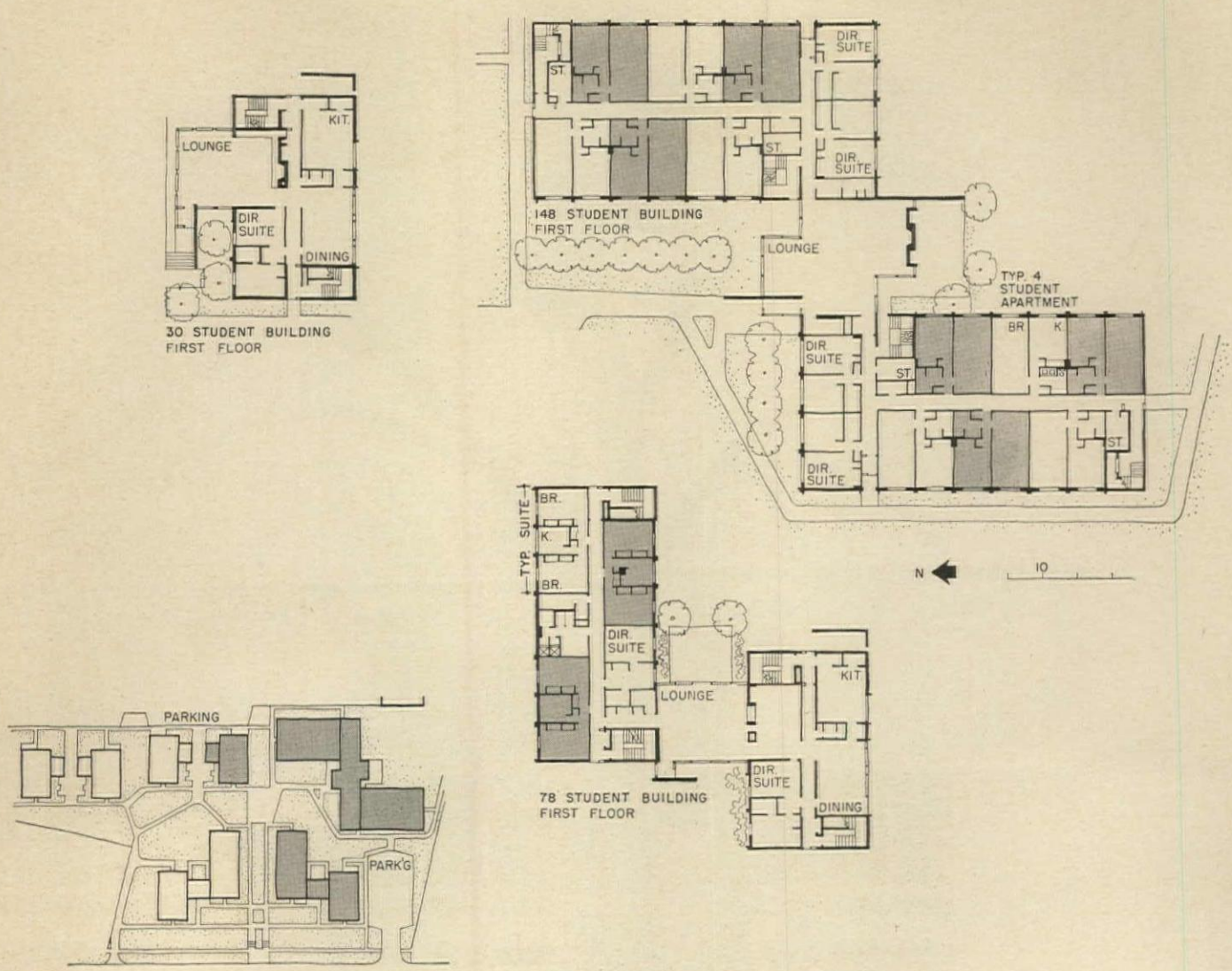
In discussing this group of town houses in an urban renewal area near the University of Chicago, architects Fred and William Keck report that heavy demand for four-bedroom town houses, versus requests for those with three, caused six out of eight smaller units to be made larger. An alternate second floor plan had already been prepared, so the change went smoothly.

The project consists of 12 town houses in two groups (*plan above*), with four four-bedroom units at the ends. Most of the smaller inside units were changed, as noted above. Each unit in the privately organized venture is individually owned, with the usual party wall agreements. Ownership includes a 20- by 30-foot backyard, enclosed by a paling fence for supervised children's play or family relaxation. The large common lawn area (*below right*) is owned by all tenants. Private off-street parking is provided on a one-for-one basis, freeing the street for visitor parking. Each house has a full basement, which can be developed for recreation if the owner chooses.

The buildings are constructed of brick, with concrete block backup. The cores of the blocks in party walls are filled solid with concrete for soundproofing. First and second floors are of prestressed concrete construction, making them virtually fireproof; the roof is of wood joist construction, insulated and ventilated. Kitchens are furnished with built-in equipment, including refrigerators.

Town Houses, 48th and Woodlawn Avenue, Chicago, Illinois. Architects: George Fred Keck—William Keck, engineering by the architects; general contractor: Nathan Linn and Sons

Hedrich-Blessing photos



UNIVERSITY HOUSING IN RESIDENTIAL SCALE

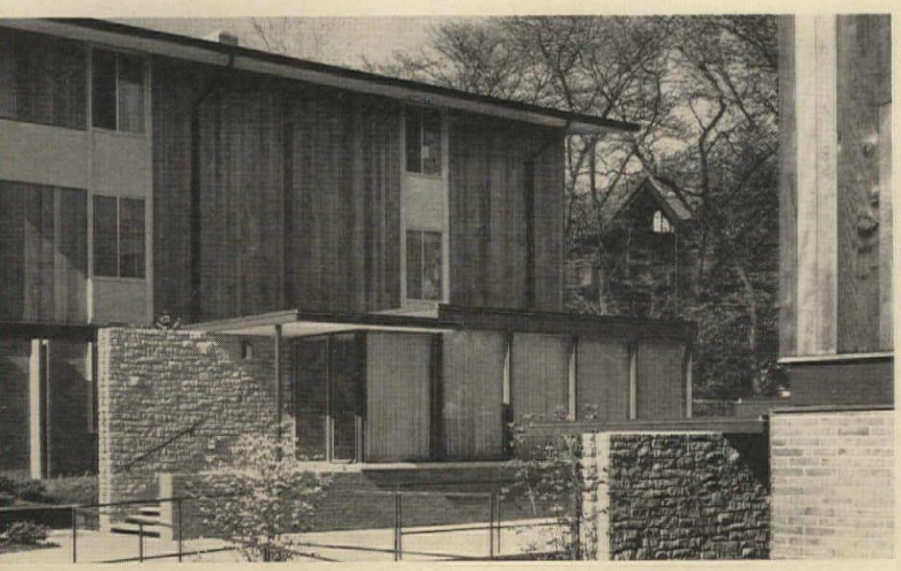
In explaining the unusual concept for these girl's houses at the University of Michigan, Peter Ostafin, assistant to the vice president of the university, says: "The sophisticated program for Oxford Houses incorporates within its variety a history of student housing from freshmanhood to graduate status; from togetherness at the early orientation undergraduate level to the freedom and preferred privacy of the upperclass and graduate student; from supervision to maturity and freedom. Oxford Houses come closer to pointing a new direction in university housing than anything I have seen here or abroad."

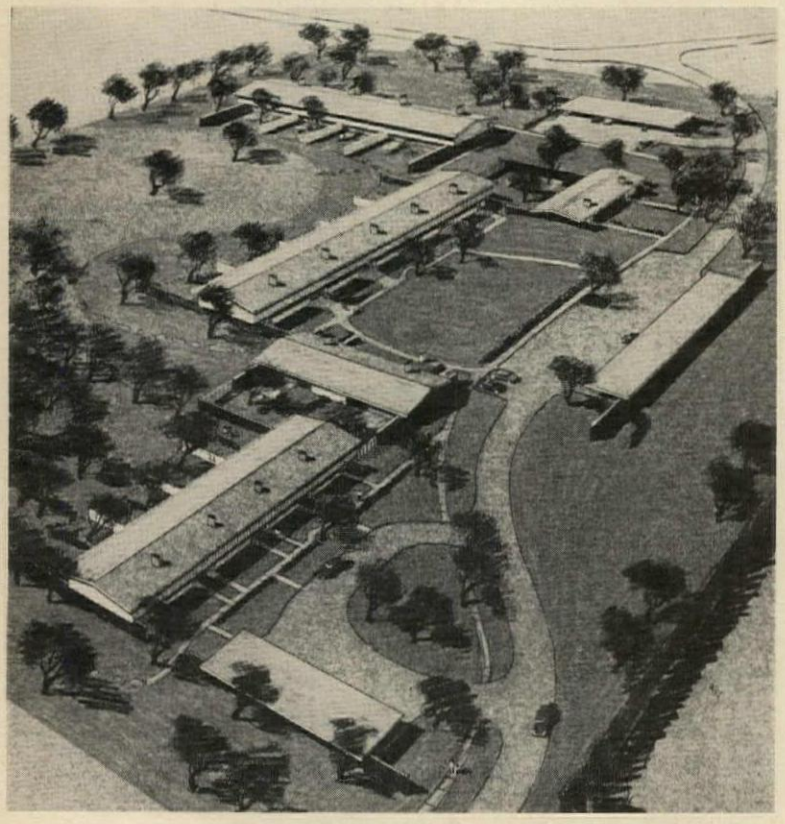
The project consists of nine houses on a 4.3-acre plot in a residential area, and accommodates 420 students and eight adult directors. There are three basic types of units, which range from two-girl bedroom-study suites with community baths, kitchen and dining facilities, to complete self-contained apartments; some for four girls, some for two. Director's suites are located in various buildings.

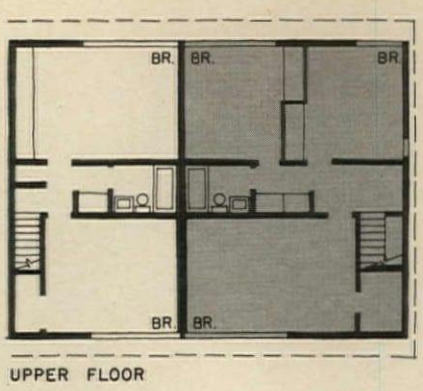
The buildings are of steel frame construction with reinforced concrete floor slabs; exterior walls above the first floor are insulated, noncombustible steel stud and plaster construction with redwood siding; roofs are asphalt shingles; interior partitions are of plaster on steel studs. Each building has a community lounge with fireplace; several have an outdoor patio with built-in barbecue equipment.

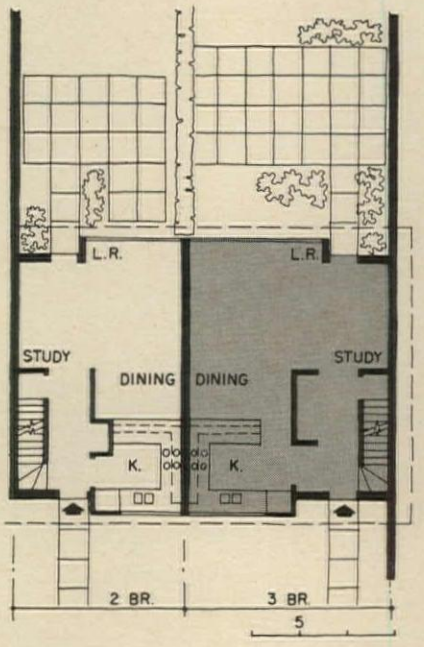
Oxford Houses, University of Michigan, Ann Arbor, Michigan. Architect: Frederick Stickel Associates; structural engineers: Clifford Tolforty Associates; mechanical and electrical engineers: Levin, Pierce and Wolf; landscape architects: Johnson, Johnson & Roy; general contractor: Erickson and Lindstrom

Balthazar photos









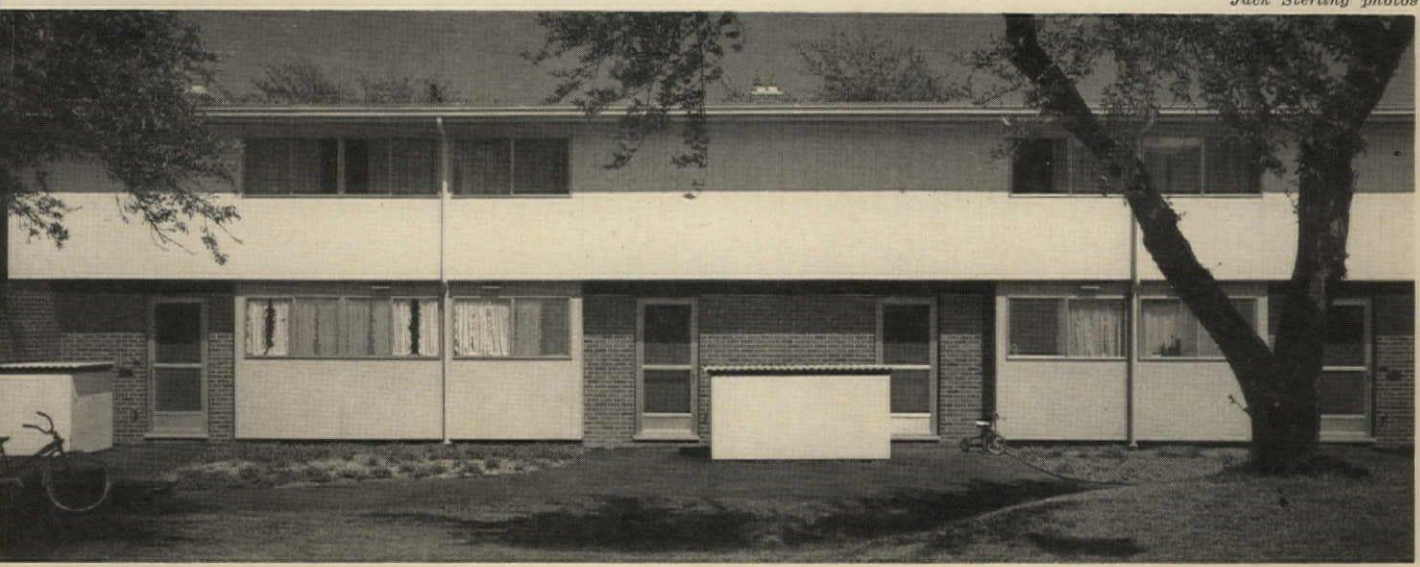
HOSPITAL STAFF HOUSING OPENS TO PARK

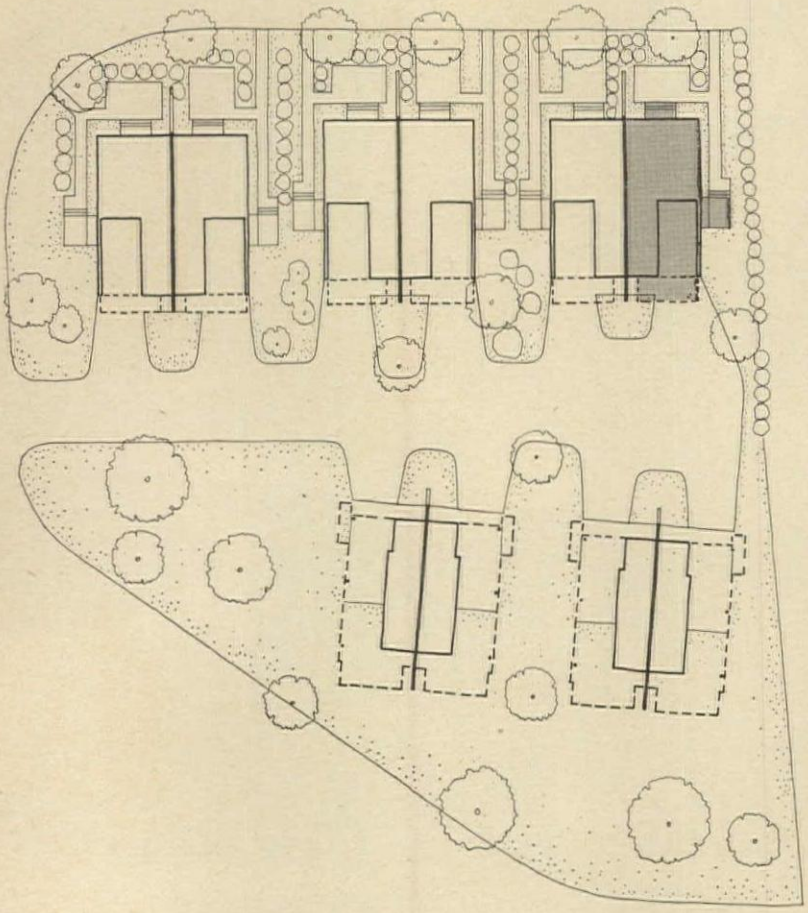
As the aerial perspective (*above*) shows, the staff housing for Highland View Hospital is organized so that its row housing units—which are oriented either south or east—open up to a large private park area, which occupies the top and left portions of the rendering. North lies to the right in this view, which shows also how the entrance road and a buffer zone are located in this portion of the plot. The entrance courts are designed to provide areas for common "front yard" community activities, while a series of wing walls, fences and hedges—set at right angles to the rows of houses—provide privacy for back yards without destroying the more distant view of the trees and park. Architect Robert A. Little points out that "the design is based upon a counterpoint, in which the upper elements of second floor blocks 'float' in the orchard trees, while ground elements such as walls, walks and planting flow freely out into the terrain. The long, low row housing structures are designed—in positioning, pattern and scale—to make the most of the existing trees."

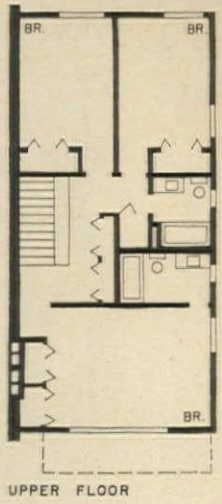
Houses range in size from one-story, one-bedroom units to two-story, three-bedroom units. The plans are compact and the construction cost—exclusive of land, site improvement and fees—was a surprisingly low $12 per square foot. Construction and materials were essentially residential in nature.

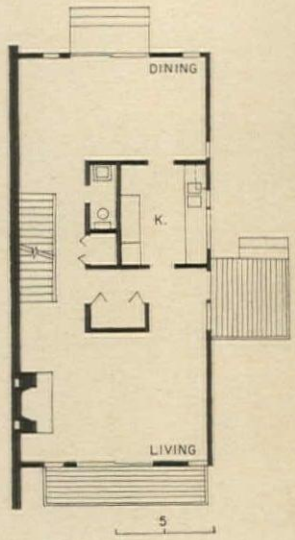
Highland View Hospital Family Housing, Cuyahoga County, near Cleveland, Ohio. Architects: Robert A. Little & George F. Dalton & Associates; mechanical engineers: Fleming, Pfitzenmaier & Weeks; electrical engineer: William B. Ferguson; general contractor: John G. Johnson and Sons Construction Company

Jack Sterling photos









NOTABLE USE OF LIGHT IN TOWN HOUSES

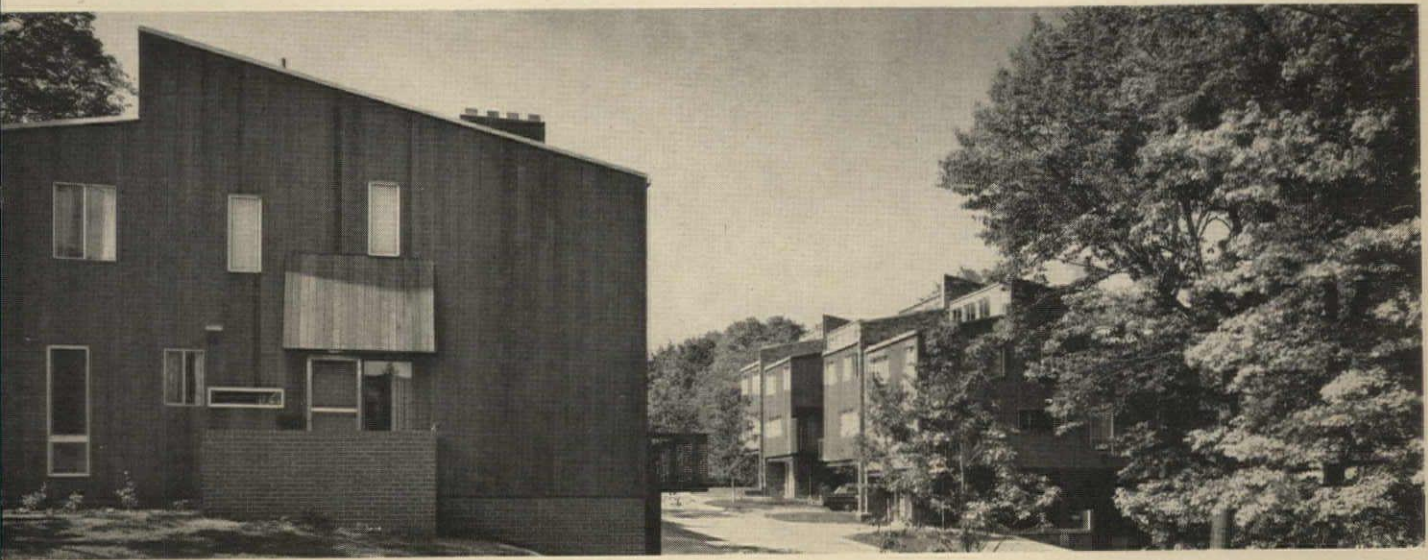
Regarding the design of these town houses on a hillside with a sweeping view of Pittsburgh, architect Ralph Drury says: "Two house types were possible, since the rear of the site has a softer slope than the front. One type has the living level at grade; proper for small children. The other has the living level elevated for those who like a perch in the trees. A clear boundary between houses was made by exposing all edges of the party walls, and by changing floor levels from side to side—the latter made possible by the secondary slope.

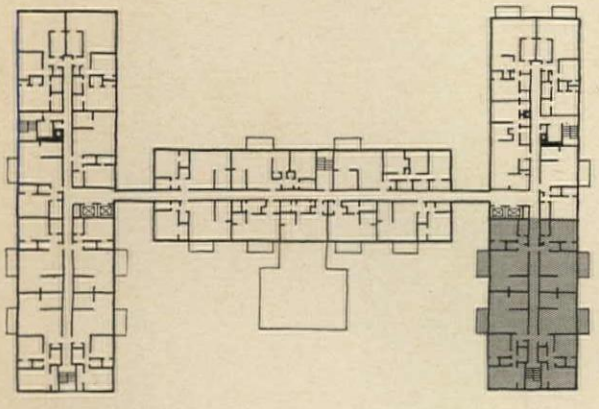
"A south-facing clerestory, top element in photo (*above right*), brings a flood of changing light into the center of the house near the party wall, an area usually dark in town houses. Bedrooms have interior clerestories for light from the central hall. Thus, every major room has light from at least two directions, establishing a fabric of space and avoiding the unpleasant directionality common to most compact housing. A variety of selected views also aids in expanding these condensed spaces: in the main bedroom the contrast between the distant view of the city from the north windows and the near view of the wooded hillside from the south clerestory makes a strong tie with the surroundings."

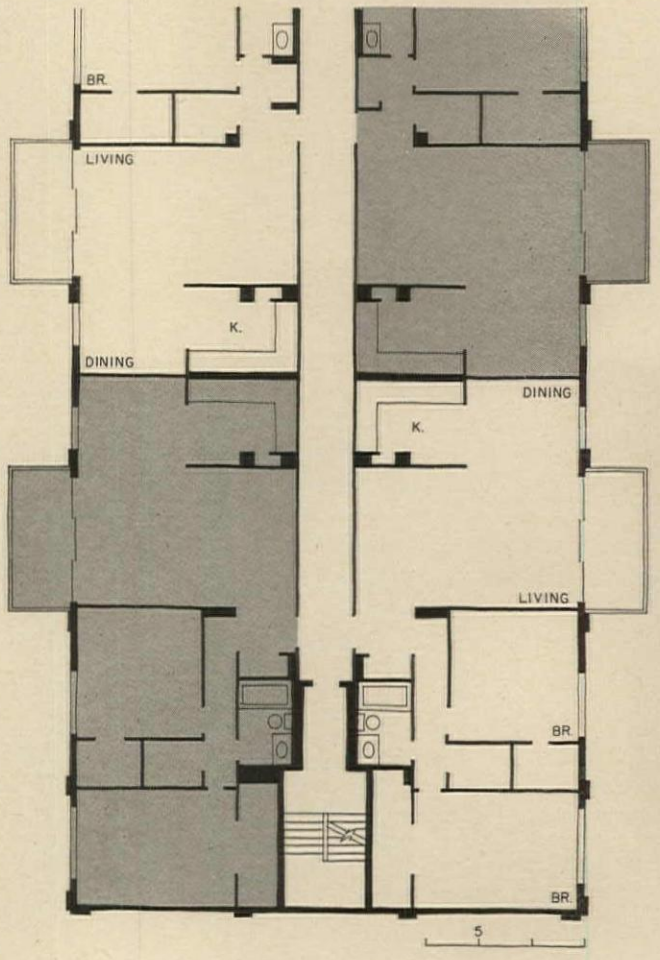
The construction and equipment budget was a notably low $11 per square foot. Each house "package" includes lot, landscaping, air conditioning and complete kitchen equipment.

Maple Heights Town Houses, Pittsburgh, Pennsylvania. Architect: Felix Ralph Reinhold Drury; structural engineer: Joseph Spagnuolo; mechanical engineer: Harry Bucher; general contractor: The Academy Construction Company

Joseph W. Molitor photos







DEFT HANDLING OF CONCRETE AND BRICK

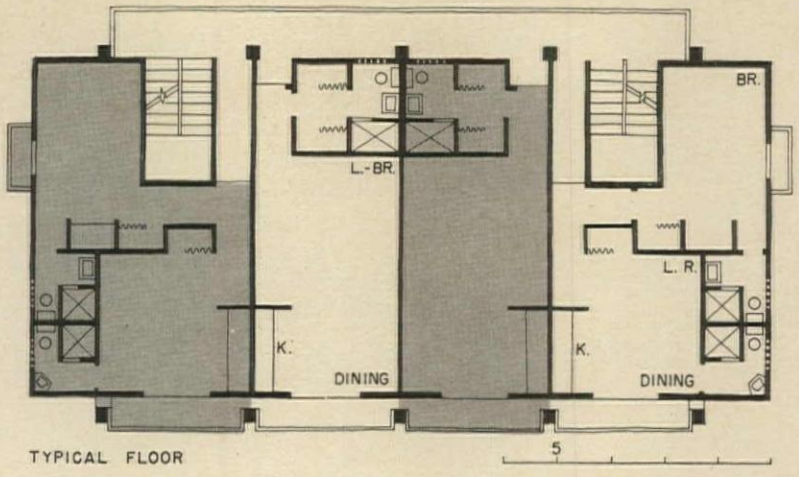
The exposed concrete structural frame and brick infilling panels for this three-building apartment development near Washington have been handled with unusual skill to provide a pleasing pattern. The balconies have also been brought into conformity with the structural bay modularity to good effect; fenestration is the only element seemingly at odds with the general organization of the facades.

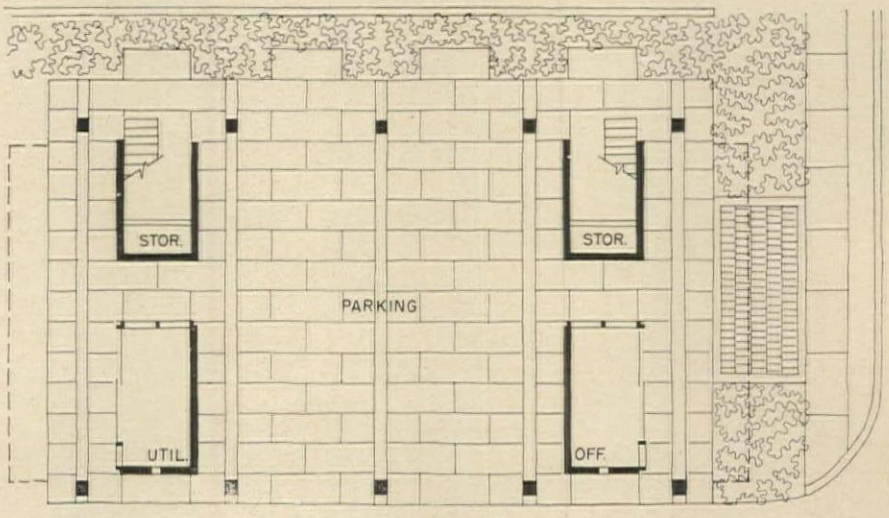
The three buildings—each 12 stories high—house a total of 279 living units, and are disposed in an open "H" shape. They are linked by metal and glass-enclosed bridges 5 feet wide; a scheme that eliminates dark inside corners and makes it possible to provide windows for all interior spaces. Separating the buildings also helps ameliorate the "endless corridor" effect that can easily result from locating 24 apartments on each floor. The buildings cover only 8 percent of the 12½-acre site, which is otherwise devoted to recreation, with necessary parking confined as far as possible to peripheral areas. The picture (*below right*) shows the cloverleaf-shaped swimming pool and putting green at the rear of the buildings; the entrance court—on the opposite side—features a decorative spray fountain for air-conditioning water.

The balconies are a generous 6 by 14 feet; corridors are carpeted; there are individual air handling units; bathrooms have infrared heat lamps.

Munson Hill Towers, Fairfax County, Virginia, near Washington, D.C. Architects: Cohen-Haft & Associates; structural engineers: Hanson & Craig; mechanical engineers: Silver Associates; landscape architect: Thurmond Donovan; general contractor: L. G. Meltzer Development Corporation

Robert C. Lautman photos





UNUSUAL STRUCTURE BOLDLY EXPRESSED

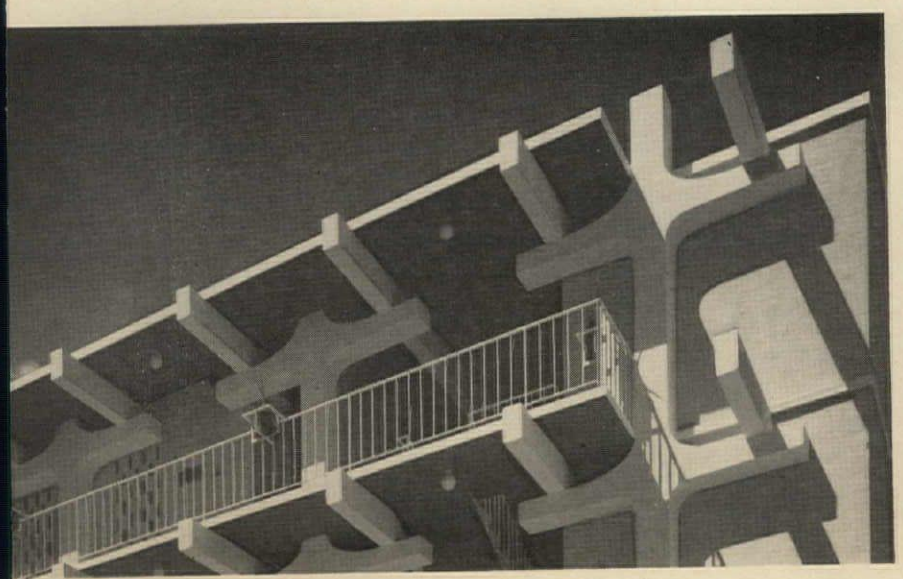
Dubbed the "Tree House" when under construction, this unusual apartment building in the Waikiki area of Honolulu is of considerable interest both esthetically and technically (ARCHITECTURAL RECORD, October 1961, page 179). The building's structural system consists of two parallel rows of precast concrete "trees" four stories high, which support, in turn, the prestressed floor and roof joists. The facades boldly express the building's unusual structure, and in so doing create a sculptural effect that produces a striking chiaroscuro in the strong Hawiian sun. The joists have been extended beyond their use point for heightened effect; the trees have been designed with their horizontal arms tapering into the verticals as an expression of stress lines; the continuous balcony railings and slabs serve to tie the elements together. Altogether the effect is appealing, although some *aficionados* may criticize it as being too busy.

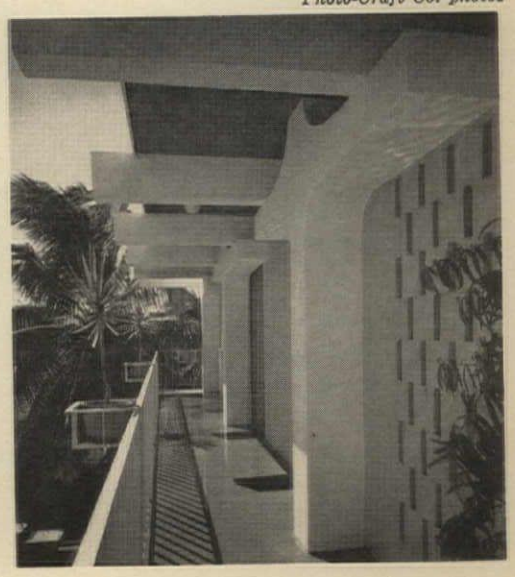
The building houses a total of 12 apartments of two types, which the rental agent would describe as efficiency and one-bedroom units. Continuous balconies at opposite ends of each apartment serve as corridors and provide cross-ventilation.

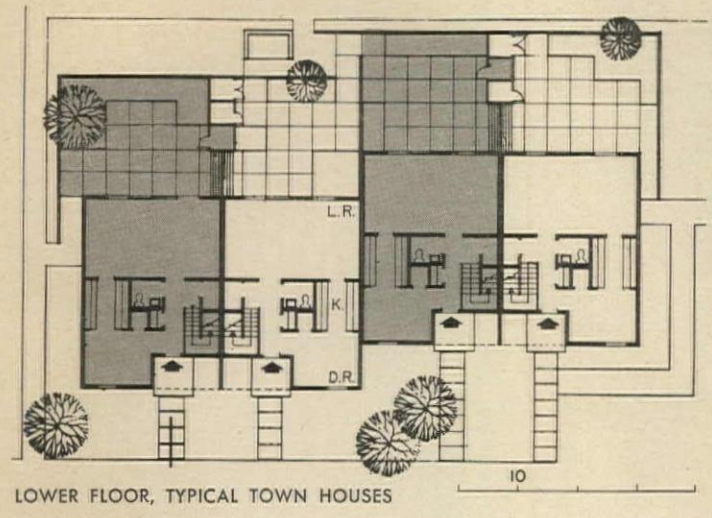
The exterior walls are of hollow block with a cement wash and paint both inside and out; the sliding glazed doors are of resawn redwood; ceilings are of acoustical plaster; partitions are of gypsum board on metal studs; the concrete slab floors are variously finished with carpet, quarry or cork tile.

The Tree House, Honolulu, Hawaii. Architects: Morse & Tatom; structural engineers: Alfred A. Yee & Associates; general contractor: T. Takahashi, Limited

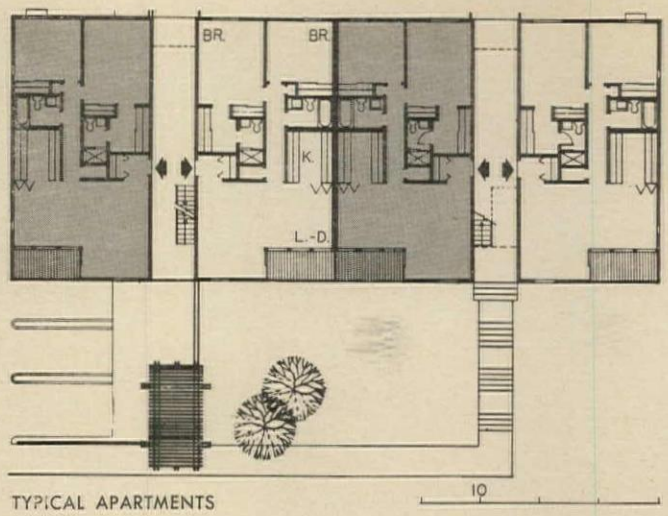
Photo-Craft Co. photos



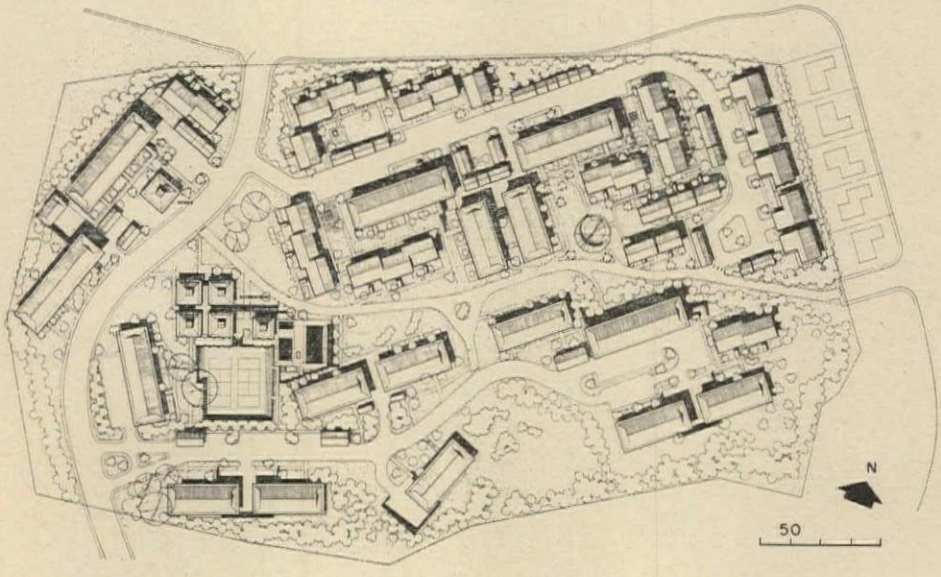




LOWER FLOOR, TYPICAL TOWN HOUSES



TYPICAL APARTMENTS



DEVELOPMENT PLAN SEPARATES TRAFFIC

This West Coast development of 219 dwellings is commendably planned for pedestrian protection by separating—as far as possible—moving cars and people. As the master plan shows (*above*) this is accomplished by confining automobiles and parking to peripheral areas and roads, with living units facing inwards to a series of common "greens." These open spaces vary in size, providing a pleasing modulation in scale as one moves about. The buildings range in size and mass from single-family detached houses to one-bedroom walk-ups, and provide a low density pattern in line with FHA requirements. There are 53 one-bedroom units, 117 two-bedroom units and 49 three-bedroom units. In addition, there is a central recreation building (*page 220*) containing an exercise room, sauna baths, lounges and restaurant; the locker rooms serving for nearby swimming and tennis.

The character of the 24.5-acre sloping site was maintained; existing trees were protected and new ones added; the natural topography was used; all utilities were kept underground. In addition, large perimeter areas to the south and west were left in a natural undeveloped state as play areas for children. Exterior materials and colors were chosen to complement nearby neighborhoods.

The Meadows, San Rafael, California. Architects: Welton Becket & Associates; structural engineers: Chin and Hensolt; mechanical engineers: Eagleson Engineers; electrical engineers: Edward S. Shinn & Associates; landscape architect: Douglas Baylis; general contractor: Stolte, Incorporated

Joshua Freiwald photos

The top photograph shows the community center and development office; that at center pictures the dining room area in the central recreation building; the one below shows the central recreation building exterior.

Throughout the development, typical structures have timber frames, utilizing prefabricated trusses, laminated beams and circular concrete columns. Exterior materials are cedar shingles, redwood siding, cement plaster, aluminum sliding doors and earth-colored roof slag. Interior walls are gypsum board and cedar paneling; ceilings are gypsum board and fir decking; floors are of vinyl asbestos tile, oak parquet or carpeting. Dwellings have individual air-conditioning units with central service

Architectural Engineering

Steps to Prevent Built-up Roofing Failures

A new study by William C. Cullen of the National Bureau of Standards is reported to show that splitting in the waterproof layer (membrane) of built-up roofing is caused by stress concentrations which occur over insulation joints due to the cumulative movement of both the insulation and the membrane. Cullen states that the incidence of splitting failures can be reduced by making certain innovations in roof design and roofing procedures.

In a previous study of premature failures in built-up roof systems, splitting had been postulated to result from thermal shrinkage of the roof membrane. However, recent tests showed that the coefficient of linear thermal expansion of the membrane are greater than that of the bituminous saturated, reinforcing felts from which it is constructed, but less than that of the bitumen used as the plying cement.

Cullen concluded that thermal shrinkage alone cannot produce the stress needed to split the membrane, although it is a factor that must be considered. According to the report, experience indicates that this additional stress may be produced when sections of insulation to which the membrane is secured draw apart. Using the same materials, steps may be taken to reduce the build-up of a stress concentration and thereby reduce splitting.

The NBS study recommends the following roofing procedures to reduce splitting failures of built-up roofs: (1) tape insulation joints; (2) place long dimension of insulation boards parallel to short dimension of roof; (3) place roofing with "in machine" direction parallel to long dimension of roof; (4) use expansion joints—not structural—in membrane; (5) use optimum-strength adhesive bonds to hold roof membrane to insulation.

(Effects of Thermal Shrinkage on Built-up Roofing, by W. C. Cullen, NBS Monograph 89)

Certification Program for Ceramic Tile

The Tile Council of America has announced the first quality testing and certification program in the ceramic tile industry. Effective April 1 the Tile Council begins certifying that tile bearing its certification mark equals or exceeds the highest quality standards set forth in Commerce Department Simplified Practice Recommendation R61-61 and Federal Specification SS-T-308b. Such tile may bear the Tile Council's copyrighted certification mark—an equilateral triangle with a circle in the center. Quality characteristics involved include color harmony or uniformity, facial dimensions and defects, warping, wedging, crazing, water absorption, thickness and other factors.

System Proposed for Identifying Plastics

"Lack of identifying marks in finished products to indicate the nature of materials from which the products were made has on occasion caused rejection of plastic building products by code agencies and building inspectors . . . It does not necessarily follow that building codes, per se, greatly restrict wider use of plastics in construction. The fact of the matter seems to be that codes permit far greater use of plastics than the building industry has seen fit to undertake . . . Clarity and simplicity of identification are becoming important requirements for further expansion of the market."

These quotes from a new bulletin issued by The Society of the Plastics Industry Inc. indicate why a joint committee of the Manufacturing Chemists' Association and SPI has proposed a new voluntary system of terminology and marking. The first term is the trade mark, the second is the generic name, the third is the ASTM abbreviation. It is suggested that these be applied to end-use products which would be marked accordingly.

This Month's AE Section

SOLVING LEAKAGE PROBLEMS OF PARAPETS

Roof leaks that defy tracing; water that flows upward; the roofer is not always guilty

By Harlan Edwards

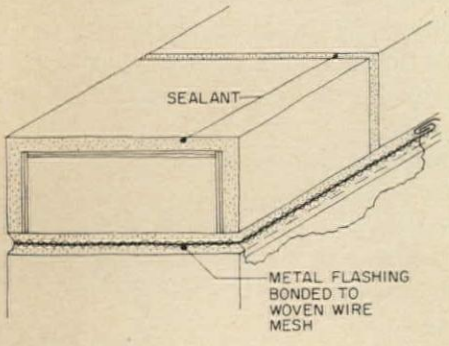


Figure 1

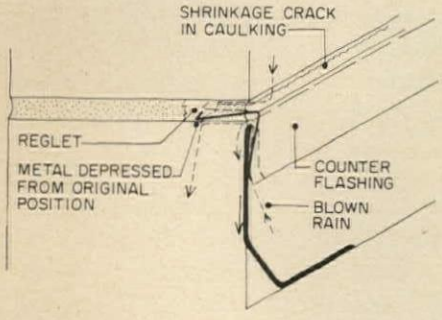


Figure 2

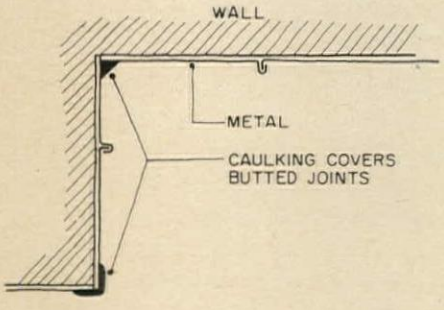


Figure 3

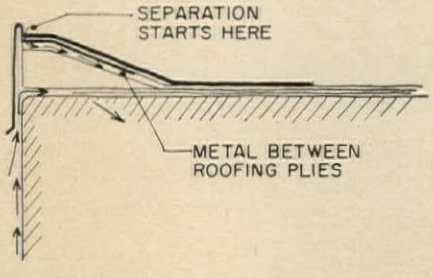


Figure 4

Here are nine ways that leaks occur in and around the parapets and gravel stops of buildings. Many leaks can be readily prevented. Many defy detection after they occur. Some can be blamed on the roofer. Some can not.

1. Temperature variations acting on units of masonry parapet caps and walls cause repeated expansion movements of the units which later may shrink but never return to their original positions. Unless there is effective through-wall flashing built into the masonry, water will penetrate to the concrete roof slab and travel under the roofing. It may reach an inner wall before finding a crack or an opening around a pipe through which it can drop a floor or two in partition or pipe chase before coming out into the open.

For permanent correction of cap leakage, remove the cap stones and mortar bed and install a through-wall flashing perhaps bonded to wire mesh or some other configuration that will maintain the masonry bond through the joint (Figure 1).

If this cannot be done, however, replace the stones on a strong mortar bed, but use no mortar in the vertical joints between stones. The perimeters of these joints should be sealed with a watertight sealant that allows each stone to expand independently, instead of each shoving the next so that the end stone is a half inch or more beyond its original position and the wall is open again to leakage. Rake out and repoint the mortar in the masonry joints of the wall below the cap, where necessary.

2. Shrinkage cracks in an exposed concrete parapet wall and cap will permit rain to enter, flow down and streak the outside walls and eventually enter the building. Added reinforcement should be placed in parapet wall concrete to prevent cracking. A simple, low cost protection is a metal parapet facing and cap installed as shown in ARCHITECTURAL RECORD, May 1964, page 209. Should there be an objection to the metal cap showing from the outside, a notch can be cast in the outer top corner of the wall, into which the metal cap can be terminated and made secure by the proper clip, then caulked along the bottom joint below the metal to prevent water from being blown upward.

3. Metal counterflashings inserted into reglets provided or raked into masonry mortar joints are very common sources of leakage because of the nature of their installation (Figure 2). After their insertion, they are frequently wedged down to solid bearing with the inner edge of the metal sloping down from the face creating a continuous in-turned funnel along the wall. This is then sealed with caulking compound which far too often does not fill the space solidly. Even a mortar seal shrinks eventually. In either case, dry-out shrinkage gradually creates a fine crack which increases in size, eventually opening the wall-joint to rain running down the face, thence into the building. Instead of always exposing itself nearby, the water sometimes follows a concealed path for many feet. Other than to the trained eye, these leaks are generally hard to detect.

4. During heavy rains, water sometimes blows across a ponded deck, up behind counter-flashing that has been bent. Such blown rain can go over the top of a roofing turnup that has pulled away from its mopped adhesion to the wall (Figure 2). This pulling away can be caused by shrinkage during a cold night when temperatures drop below 40 F, the point at which most bitumen becomes

Harlan Edwards is a professional engineer and holds patents on various weatherproofing devices based on his specialized experience

Figure 5

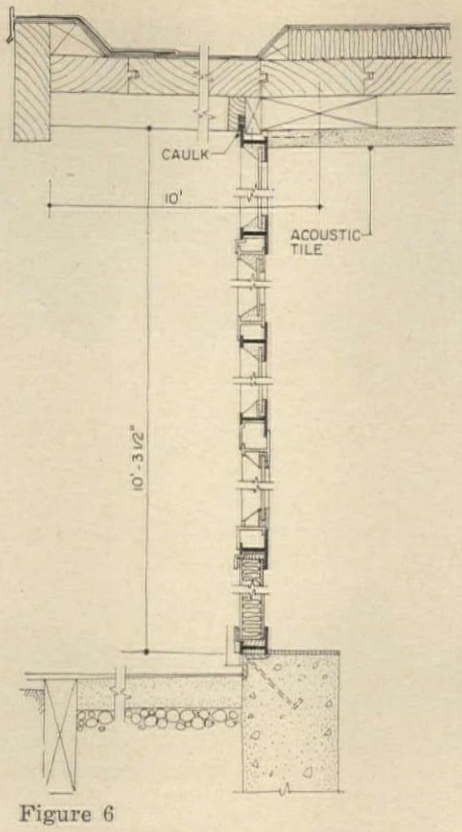


Figure 6

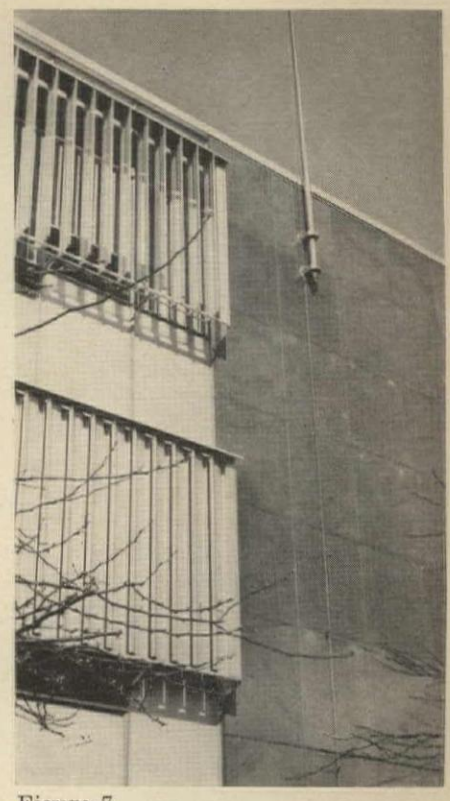


Figure 7

brittle and easily broken. The water's path, henceforth, is perhaps across the slab below the roofing and then through a crack, or it can travel other routes equally hard to find.

5. Water can come in through roofing breaks in the cant strip area or at angle points in flashings or reglets where protective metal has been merely butted, not carried continuously around the corner (Figure 3). When this type of sloppy installation is made, the perpetrator often camouflages it with caulking compound (of aluminum color if he really means to hide it). The detected presence of such caulking should be cause for rejection. But, often, the sad fact is that by the time discovery is made, the guarantee has expired and the owner pays the bill.

6. The placing of metal down a wall or parapet and square out under or between plies of roofing as a part of a gravel stop (Figure 4) is also a well-known, oldtime practice that is sure to cause leakage. This leakage is made possible by the destruction of the adhesive bond of roofing to metal by contraction during cold nights. Also, beads of water often form on the metal where the rough-cut roofing abuts it. The use of non-hardening roofing plastic instead of hot mopping bitumen in the build-up of the plies in these areas helps to maintain some degree of protection, but it probably will break down eventually.

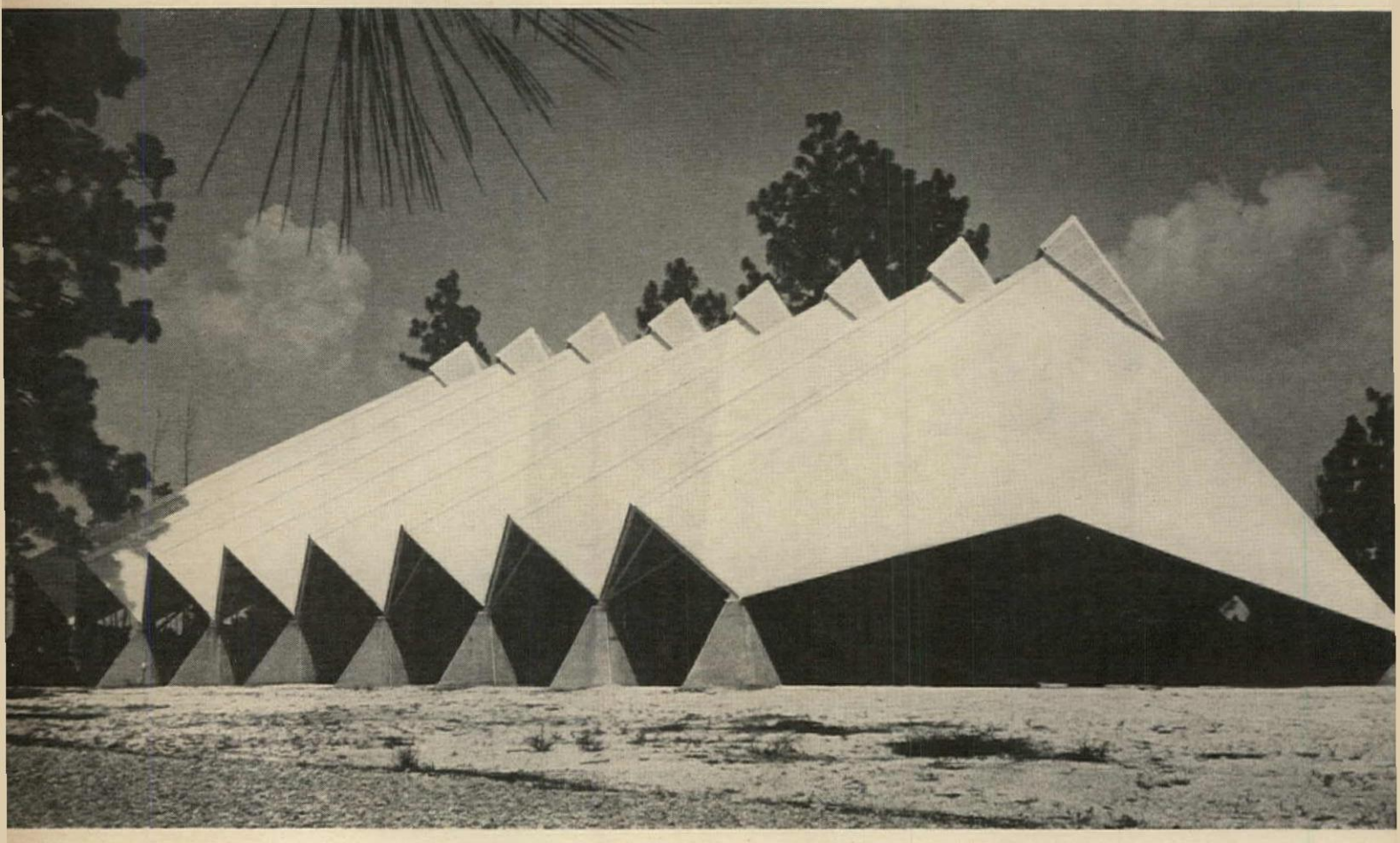
Leaks due to omission of weather proofing components and dry-out shrinkage are sometimes baffling, and roofers are frequently blamed for them undeservedly. The following are representative occurrences.

7. Sometimes the open crack at the junction of the top of a wall and an overhanging roof is not sealed solidly in the belief that no water could ever get up that high. But on one job on which I worked, high winds pushed water up an exposed masonry wall about 10 ft to the underside of a roof slab which was cantilevered about 4 ft. Under the urge of continued high winds, water shot through a space left by dry-out shrinkage and deposited a floor-covering sheet of water in the room within. Of course, filling the crack with sealant corrected it.

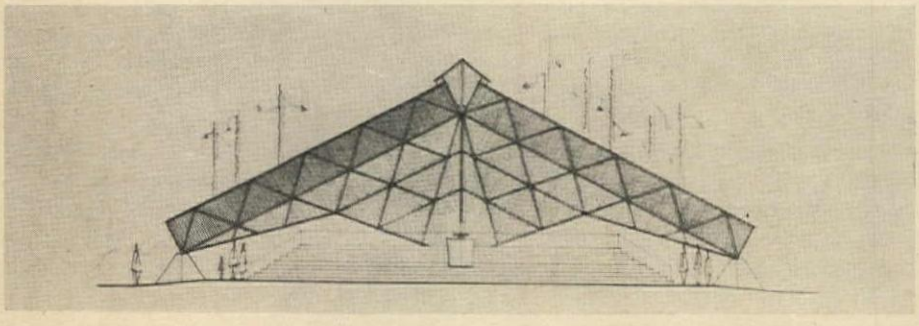
8. On another job, water was whipped almost 10 ft up a glass wall that was facing the weather but protected by a 10-ft overhang of the roof covering a walk adjacent (Figure 5). Had the work been installed as detailed (Figure 6), a leak would not have been possible, but an outer protective mold had been left off, the space between window metal and inner construction had not been caulked. A 75-mile wind whipped the rain up the wall, and like a giant spray gun, forced it over the top, soaking three lines of acoustical tile the length of the building, leaving puddles on the floors.

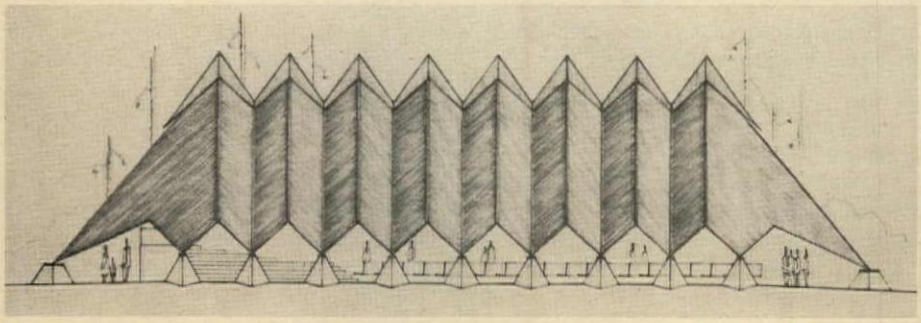
9. On still another job, rain was blown up a three-story granite-faced building wall (Figure 7) back of an extruded aluminum parapet-cap facia and thence over the top of the 3-in. granite facing. It not only filtered down the poured mortar backup, but soaked the granite and ran down its face leaving white streaking in its wake. In addition, it filtered to the inside through the concrete building wall, kept abutting plaster walls damp, created plaster rot and ruined the paint job on the walls.

As with the other buildings discussed, the roofer was at first blamed until he proved himself innocent by tests. In this case a snug-fitting aluminum inverted channel was made to fill the space, was bedded in caulking compound against the building in back of the extruded facia and anchored in place. There was no further trouble.



WELDED PIPE TRUSSED FRAME ROOFS OPEN AIR TABERNACLE

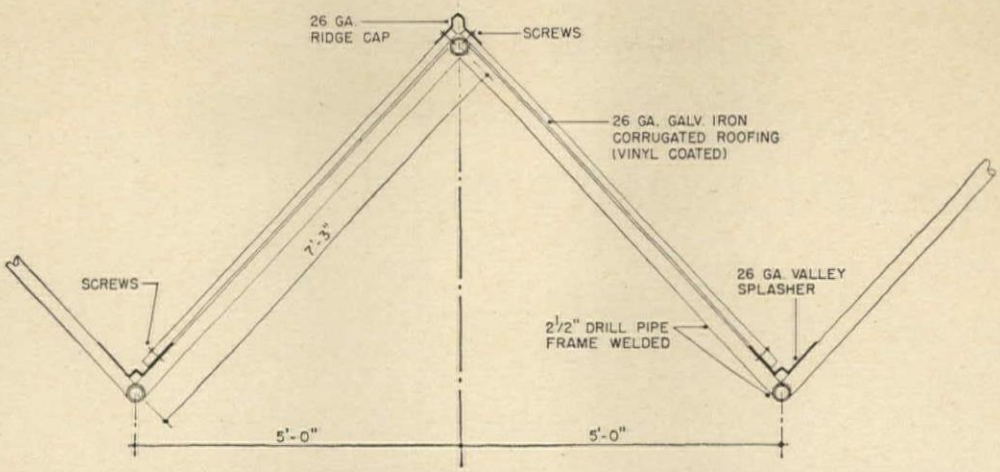


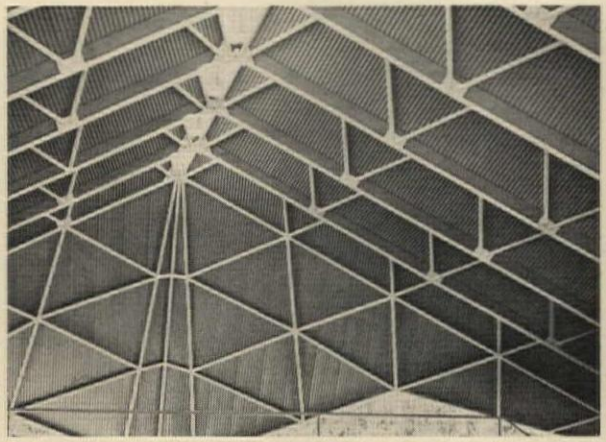


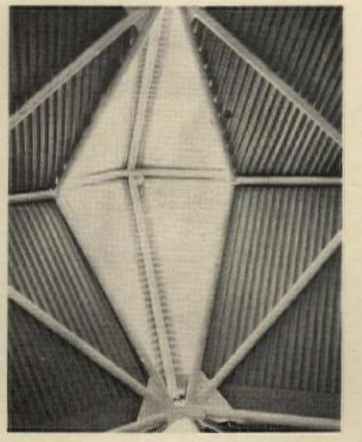
A very limited budget taken together with availability of drill pipe at very low cost and donated labor by several qualified welders suggested the possibility of a welded pipe framework for this open air tabernacle.

The design approach was to provide a continuous structural system which would eliminate the need for intermediate purlins and keep framing cost to a minimum. Total cost was held to $18,000.

The entire framework was field welded with 2½-in. pipe trusses meeting at right angles to form a continuous "folded plate" over each side of the sanctuary. The bottom chords of the opposing "folded plates" meet in the center of the structure to form a three-hinged arch. Opposing (vee shaped) double trusses were raised simultaneously and welded together where the bottom chords touch. A continuous skylight and roof vent is supported on a welded steel framework. The framework is roofed with vinyl coated heavy gauge galvanized corrugated metal sheet fastened by screws.

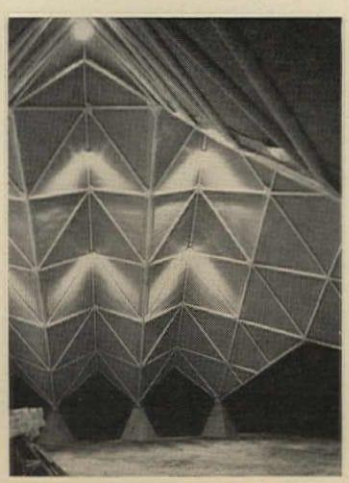


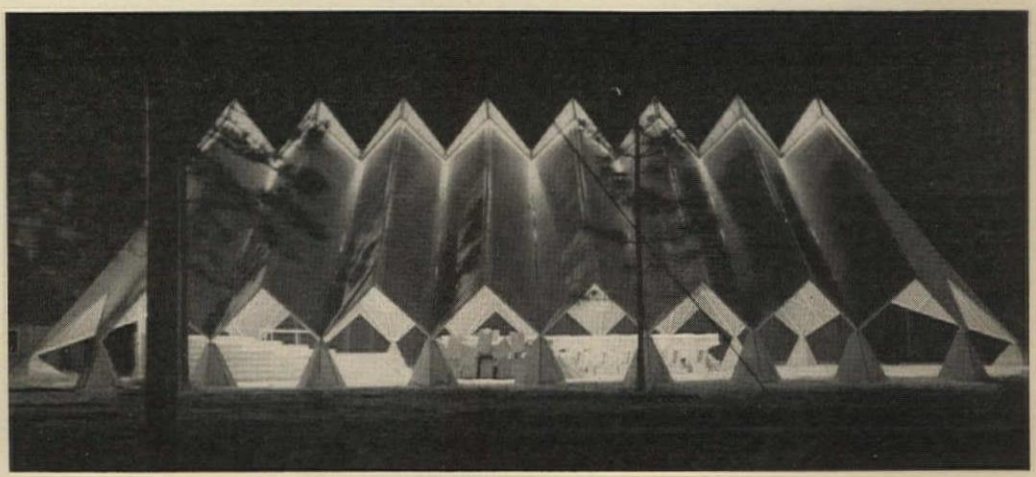




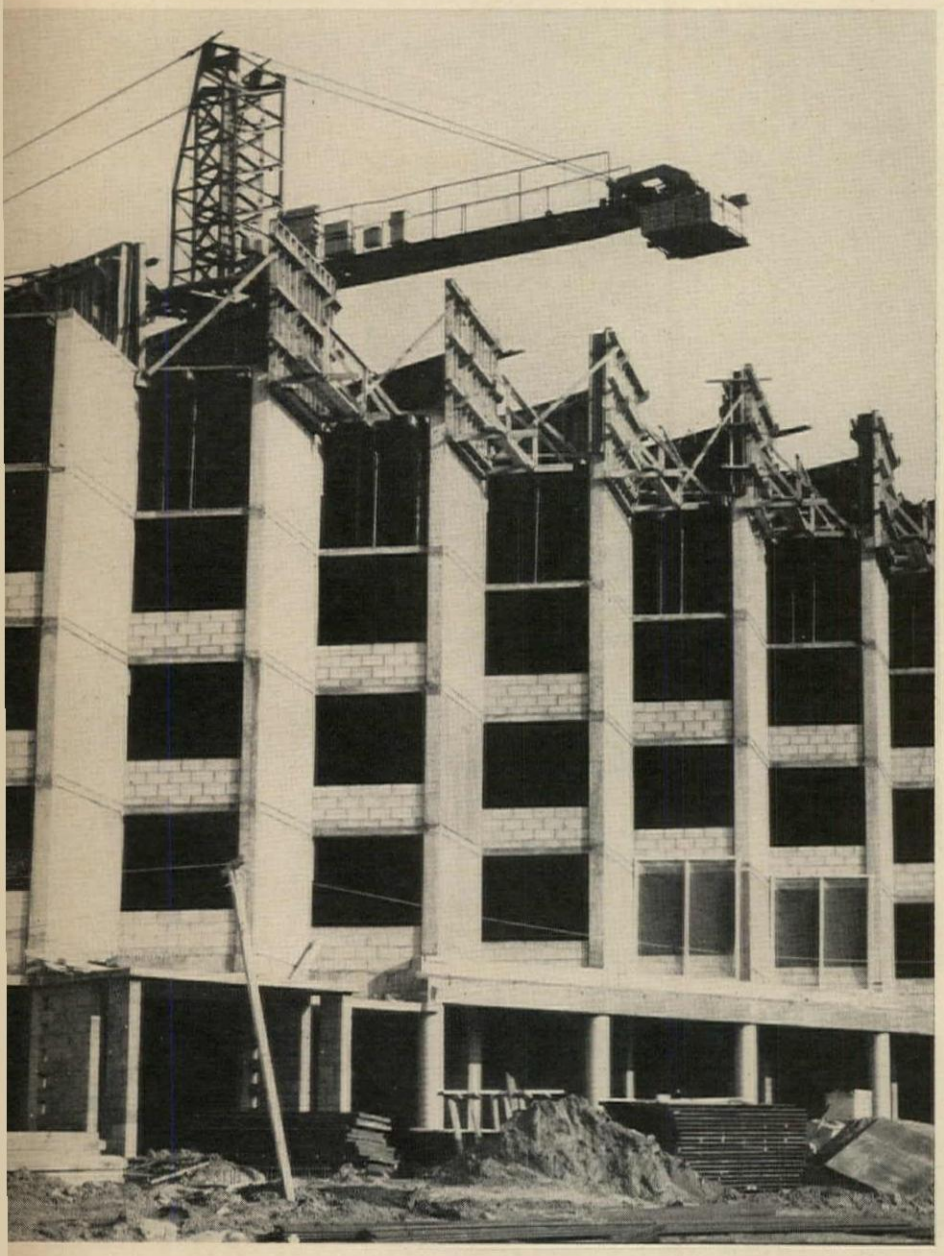
Folded truss frame of welded 2½-in. drill pipe supports roof of vinyl coated, corrugated galvanized steel. At end walls intersecting pipes are welded to form connections. At the folded truss roof, pipes are welded to angles and plates. Valleys of vinyl coated steel nest in the angles at bottom chords of the trusses. The metal roof is attached to the frame with self-tapping screws. The skylights are fiber glass reinforced plastic

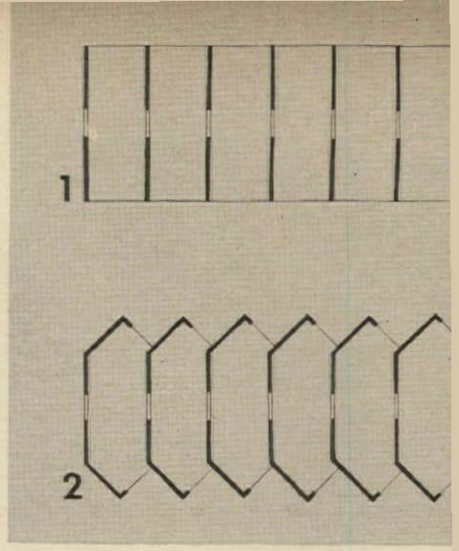
Architects for open air tabernacle in Covington, Louisiana were Frey Associates, Stahl-Shoemaker-Colbert. Interior night view illustrates basic framing pattern. Folded roof is supported by concrete piers tied crossways underground by welded steel rods. The structure was an award design in the 1964 Award Program for Progress in the Design of Arc Welded Structures sponsored by the James F. Lincoln Arc Welding Foundation of Cleveland





MOTEL WALLS ANGLED TO VIEW SERVE ALSO TO RESIST WIND





A distinctive architectural and structural feature of the new 12-story Howard Johnson Motor Hotel on Cleveland's lakefront is the folded exterior wall treatment.

The site itself posed a problem—a deep but relatively narrow plot, backing on busy railroad tracks and factories to the south, but overlooking Lake Erie to the north. How could every room in the building have a view of the lake, and at the same time be shielded from the industrial view?

A thin, multi-story building oriented in a northerly direction was dictated. With solid floor slabs, and regularly spaced transverse bearing walls (forming the individual hotel rooms) giving the structure stiffness cross-wise, it was necessary to provide structural elements which could resist loads lengthwise.

These problems were solved by folding the outside ends of all the transverse walls 45 deg toward the lake. By glazing the canted openings thus formed between ends of the transverse walls, each room views Lake Erie, and is denied the unattractive view to the south.

In the sketch, Scheme 1 uses solid slabs and bearing walls spaced at regular intervals. To resist lateral loads in the longitudinal direction, one

Top right: Sketch shows conventional box-frame construction (1) contrasted with the folded wall system (2). Since corridor walls are not load carrying, the folded walls provide lateral resistance to wind loads in the longitudinal direction. Photos show setting of a wall form (wires protruding from deck are from wall below, assuring continuity of structure) and stripping of forms. *Bottom right:* Photos show setting of floor forms, extra reinforcement of the semi-cantilevered portion of floor slab formed by folding of transverse wall, and reinforcement of end stair well

would need to add wind or seismic bending moments to those from gravity loads, thus requiring thicker slabs and walls and more reinforcing. Alternatively, one could add longitudinal walls, or merely return the transverse walls in the longitudinal direction, Scheme 2.

For the economy of forming extensive flat surfaces to be maintained, beams spanning corridors had to be kept within the depth of the floor slab, and 10 stories of building spanning over large rooms on the first floor could not be carried by conventional concrete beams, but by deep girders developed within the 6 in. bearing walls they support. A very exacting analysis incorporating ultimate strength design was used by Uldis Kirsis of R. M. Gensert Associates. This approach permitted walls 6 in. thick supporting 10 stories of building with only one layer of reinforcing required at the center. Considering that floor slabs and walls were spanning in one direction, it was obvious that they should be reinforced with large wire mats.

Welded wire fabric was specified for reinforcement of both the walls and the floor slabs for two reasons. Because of fabric's high yield strength, less steel was required than would have been needed with intermediate grade bar reinforcing. Because single large sheets of fabric are placed quickly, a substantial reduction in construction time and cost was anticipated.

At least one floor was completed every week. First step in a typical job cycle was placement of the modular floor forms. These were sections of plywood stiffened crosswise by 1½-in. steel tubing on 16-in. centers.

As soon as several bays of floor form were in place, cleaned and re-oiled, the two steel workers on the job placed sheets of welded wire fabric for bottom-of-slab reinforcement. Since there was no fear of displacement of reinforcement in large fabric sheets, the electricians and other trades moved onto the deck immediately behind the steel workers and laid duct work and other inserts. With this work done, the steel workers returned to place negative fabric reinforcement over the tops of the bearing walls, dovetailing with the single line of mesh protruding from the wall below. Concreting of the deck followed.

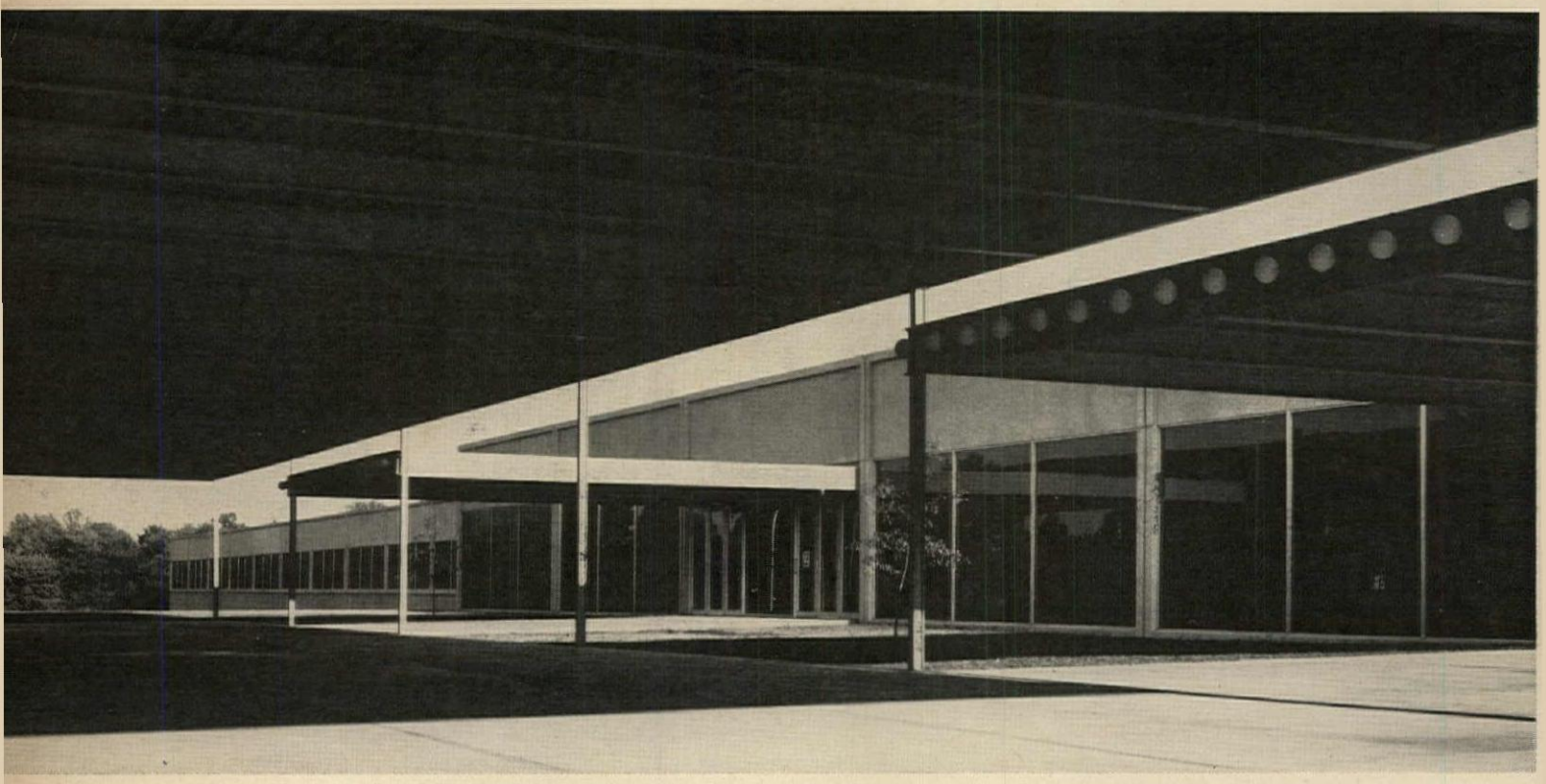
Placement of wall forms began on the same area of deck (after overnight set of the concrete). Only enough re-usable wall forms for half a floor were required, the sections being crane-lifted from one end of the job to the other by the big Linden climbing crane.

With one side of a wall form in position, the steel workers then placed in approximate position the single sheet of wire fabric required to reinforce the entire expanse of wall. The other half of the wall form was then placed, but not closed up. Electrical conduit and other inserts were placed on the wall forms on either side as required. Next the fabric sheet was tied in several places to assure its accurate position at the center of the 6-in. wall, and proper overlap with the protruding fabric from the wall below. Finally, the wall forms were closed, and concrete was placed.

Foundation

Since the new motor hotel is built on the unstable soil of Lake Erie's old shoreline, it was necessary to put down friction piles to support the 12-story structure. Nearly 300 65-ft-long piles were placed, each capable of carrying 50 tons.

Howard Johnson Motor Lodge. Owners: Memorial Shoreway Motel Associates; architects: Visnapuu & Gaede; structural engineers: R. M. Gensert Associates



BUILT-IN FLEXIBILITY FOR AIR CONDITIONING

Utility area under classroom building permits air-conditioning units to be rearranged

Air conditioning for the new East Campus of the Pekin, Illinois, Community High School has been "paid for" by architectural and engineering ingenuity that kept construction costs to a minimum.

East Campus is a $4.2 million, air-conditioned four-building complex, attended by 1,200 junior and senior students. Maximum student capacity is 2,000. Summer classes began on a limited basis last year. Summer usage will increase until, in time, the school is operating on a year-round basis.

School officials wanted air conditioning, not only for a 12-month school year, but also to permit East Campus to serve as a year-round community center. Its large auditorium, for example, is ideal for events of interest to the entire community.

The basic problem was a familiar one: can you build an air-conditioned school and stay within budget? And, if you can, will long-term operating costs also be within budget?

Despite the fact that the air-conditioning system was expected to add at least $80,000 to the cost of a conventional heating-ventilating system, the Pekin High School has been equipped with air conditioning at a cost within the original budget. The administration area, theater, cafeteria, and locker rooms are all air conditioned. The perimeter office areas are on a three pipe system with fan-coil units. The balance of the area is conventionally cooled, heated, and vented with ducts and various central fan units.

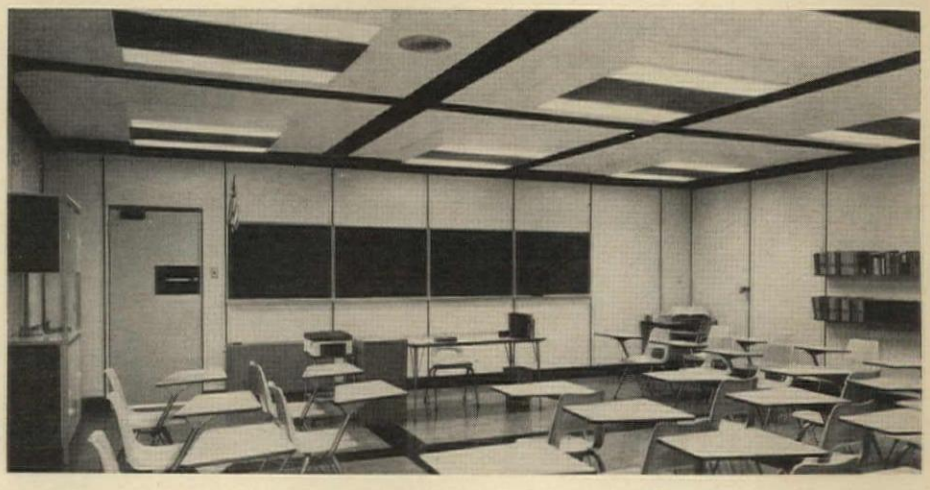
Gas Engine Drives Compressor

A naturally-aspirated engine operating on natural gas drives a 525-ton centrifugal compressor unit that provides chilled water for cooling. The cost of natural gas is less than one-half cent per hour, per ton of air conditioning. Gas consumption is 9,000 Btu per hr per ton of air conditioning. Natural gas is available to the school on an interruptible basis at a rate of five cents per 100,000 Btu. During May, 1964, 19,540 therms of gas were required to operate the air-conditioning system. The gas bill for the month was $950.40. On this basis, the cost of fuel was approximately .0045 cents per ton per hour.

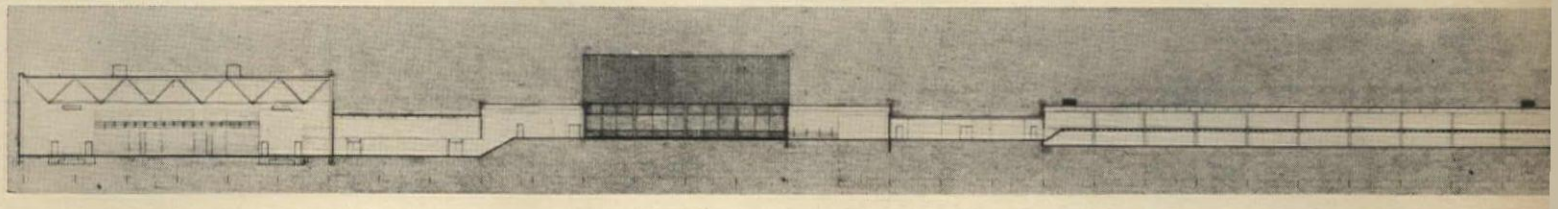
The cost of fuel for the gas engine does not include an additional economy made possible by recovering engine heat and using it to meet domestic hot water requirements.

The designers, FHTL Architects (formerly Foley/Hackler/Thompson/Lee) and the mechanical engineer, S. Alan Baird, Peoria, Illinois, fit air conditioning into the school construction budget by avoiding expensive perimeter walls used in conventional school design. Instead they adopted a simple perimeter plan,

The East Campus Project
Pekin Community High School
ARCHITECTS: *FHTL Architects*
MECHANICAL ENGINEER: *S. Alan Baird*
STRUCTURAL ENGINEERS:
The Engineers Collaborative



Throughout the classroom building, a special lighting-air return unit was used, developed by the architects. Two standard troffers were combined in a frame with a center panel perforated for air return. Photo of the classroom shows a fan-coil unit utilizing three-pipe distribution under the chalkboard. In the plot plan (*below*), A is the gym which is not air conditioned. B includes the administration area, theater, cafeteria and locker rooms, all air conditioned. C is the classroom building. D is the boiler room and location of refrigeration equipment; also industrial arts shops

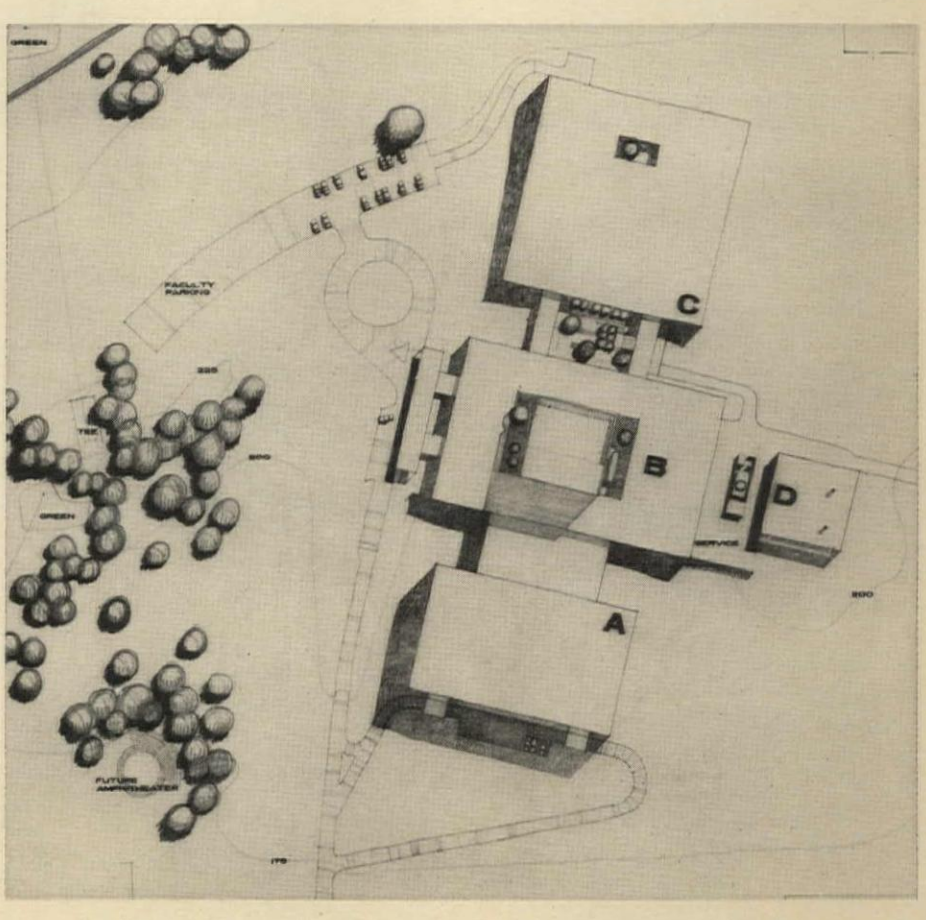


based on a central classroom area that is 280 feet square.

Each classroom is provided with 36,000 cfm of outside air, which is a little over 21 cfm fresh air per pupil. The 36,000 cfm of outside air is sufficient to cool the occupied rooms plus the light load when outdoor temperature is 55 deg or lower. Some classrooms in the central ring are windowless and as much as 100 ft away from an exterior wall. As a result, some air conditioning may be required when outside temperature rises to 55 F.

On the other hand, this building can be efficiently and comfortably air-conditioned with a smaller air-conditioning load than would be required for a building of the same size but of conventional design.

The average classroom is a 28- by 28-ft module designed for 30 students. Each is built with metal partition walls that are moveable, so that space can be increased or decreased depending on requirements. Similarly, classrooms can be readily adapted to entirely different usage on short notice. Minor structural changes can



be accomplished in a week-end, while major changes may take no longer than four or five days.

This emphasis on flexibility is reflected in the air-conditioning system, which may be needed even in cool weather. The air-conditioning system, as well as the hot water heating system, is housed in the separate plant services building. The hot water heating system is based on two boilers with combination burners, and a 2,000-gal storage tank.

Recovery heat from the gas engine that drives the compressor unit makes possible an additional economy derived from use of natural gas —heating domestic hot water at no extra cost.

Hot water for heating and chilled water for cooling are delivered to the school buildings by a three-pipe system, one for chilled water, one for hot, and a common return pipe.

A 6-ft-high utility area beneath the school floor houses pipes, ductwork and primary air supply fans. This area serves a double purpose—it not only keeps water pipes from freezing, but it also makes possible rapid and economical adjustment to air-conditioning equipment as school room requirements change. The main air distribution structure, fans and ductwork, can remain intact while auxiliary equipment is changed. The 3-in. concrete floor can be readily drilled through to adjust the air-conditioning system to meet changed size of usage of any classroom.

The primary air system delivers air through trunk ducts on approximately 28-ft centers. From the trunk ducts, round flexible insulated ducts run horizontally to the fan-coil unit locations, turn up through floor and deliver primary air into the base of the fan-coil unit. This air is dehumidified and cooled, or tempered, as the weather conditions demand.

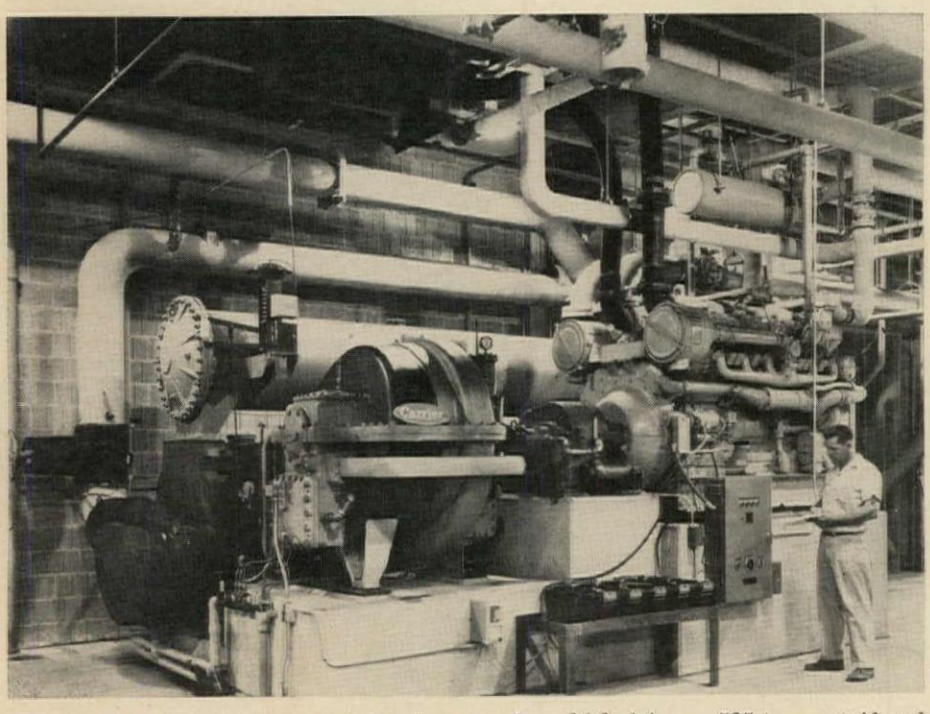
Secondary pumps and controls located in the basement area distribute to three-pipe system mains, also on approximately 28-ft centers. These mains feed the fan-coil unit coils.

Each room is equipped with fan-coil units, with a thermostat in the base of each unit. Changes in room air-conditioning requirements are sensed by the thermostats which automatically make the necessary adjustment.

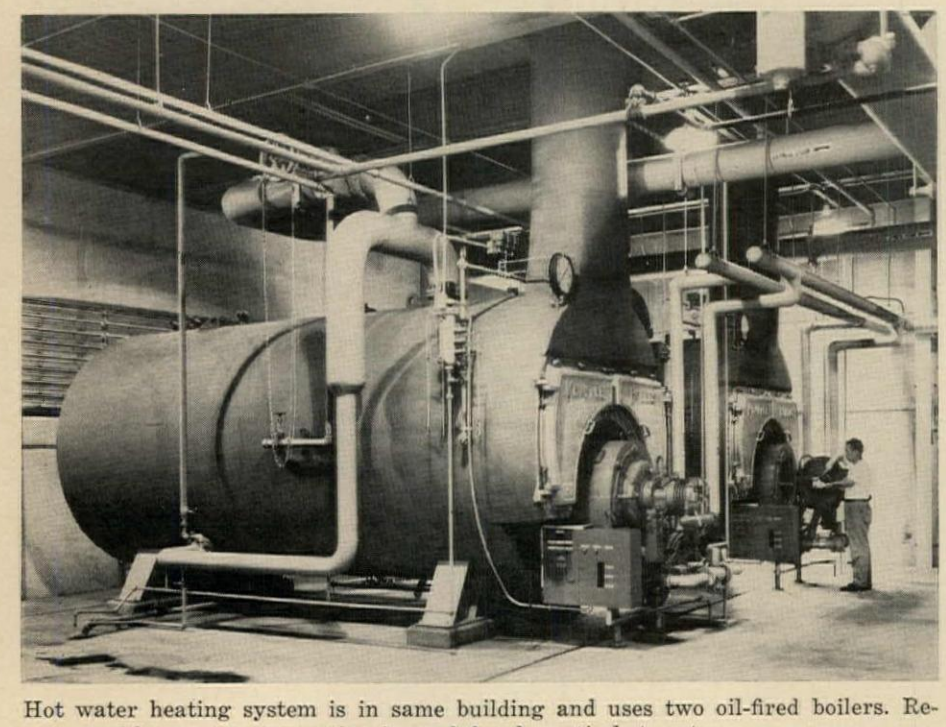
For example, if a classroom is not in use and begins to cool off below the set level, the thermostats will automatically switch control valves over to warm water distribution to keep room temperature up to the control point. On the other hand, when a room is newly occupied, and lights and heat from the occupants begin to increase room temperature above the comfort level, the thermostats then automatically call for cooling.

It is not unusual for some rooms to be heated and others cooled at the same time. In classrooms at the core of the central ring,where heat loss is through the ceiling alone, heat gain may exceed loss by 5,000 Btu/hr even when it's 10 below zero outside.

A fan-coil unit can readily be relocated, whenever the room size or arrangement is changed. Wiring, three pipe connections, pipe and flexible primary air ducts are easily re-routed in the basement.

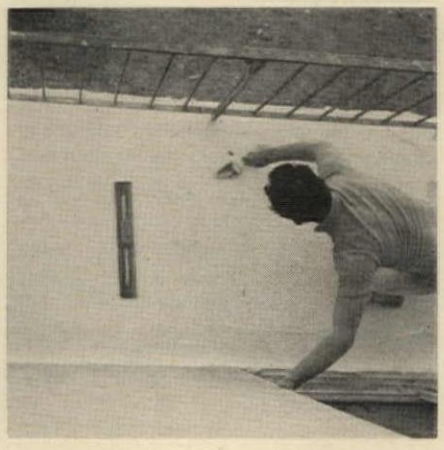


Plant services building houses natural gas engine which drives a 525-ton centrifugal compressor unit to provide the chilled water for air conditioning



Hot water heating system is in same building and uses two oil-fired boilers. Recovery of heat from gas engine is used for domestic hot water

Oxychloride cement is being used extensively for exterior stairs and balcony decks of motels in warm climates. The photos here show a typical application. Oxychloride cement is prepared by adding a water solution of magnesium chloride to a dry mix containing magnesia and inert fillers and aggregates. Cement is spread out over deck which has been covered with asphalt-saturated felt followed by diamond mesh nailed in place, The cement is leveled with a screed and finished by steel troweling. The strength of oxychloride cement floors and decks is not affected by occasional wetting.



OXYCHLORIDE FLOORS: USE AND APPLICATION

By Clark W. Redeker

Oxychloride cement floors can, with few exceptions, be used any place a tough, hard, long-wearing interior thin-section floor is desired. During the past 45 years oxychloride grade magnesia has been used in innumerable floors in stores, apartment buildings, motels, industrial buildings, institutional buildings and churches.

Oxychloride flooring is composed of magnesium oxychloride cement plus inert fillers and aggregates that form a hard, strong composition. Its surface can be finished to a fine, smooth texture.

Oxychloride cement materials are supplied to the job site in two parts, a dry mix and magnesium chloride. The dry mix is composed of specially processed magnesium oxide plus fillers (such as silex, asbestos and wood fiber) and fine aggregates (such as sand, crushed stone and other inert ingredients). When the dry mix is gauged (proportioned) with magnesium chloride solution of standard concentration, the magnesium oxide reacts with the magnesium chloride to produce magnesium oxychloride cement. This cement sets within a few hours and binds the entire mass into a hard, dense product.

Oxychloride flooring can be installed over any type of structurally sound subfloor. It is an ideal leveling underlayment that prolongs the life of composition floor coverings by protecting them from subfloor irregularities. As a top coating, oxychloride is hard, durable and attractive. The principal advantages of oxychloride cement floors are:

1. Short curing time—ready for heavy use in 48 hours, light foot traffic in 24 hours.
2. High strength to weight ratio—high strengths permit ½- to ⅝-in. thicknesses at weights of 4 to 10 lb per sq ft (weight depends on formulation and thickness).
3. Reasonable over-all cost—long life and low maintenance cost.
4. Fireproof.
5. Sanitary—monolithic installations

Clark W. Redeker is technical representative, FMC Corporation, Inorganic Chemicals Division

for kitchens discourage vermin, bacteria and fungi.

6. Abrasion-resistant—long lasting oxychloride cement floor formations cover the hardness range from soft marble to granite. They do not deteriorate with age, are not affected by the high-force-per-unit area imposed by ladies high heels.

7. Resilient—oxychloride floors tend to crack less than some other thin-section coverings especially over wooden subfloors.

8. Grease-resistant—oxychloride cement floors are not affected by animal, vegetable and mineral oils and greases.

Limitations

Following is a list of applications where oxychloride cement should not be used:

1. Locations which are continually wet or subject to hydrostatic pressure. Continuous immersion in water will gradually leach out a portion of the magnesium chloride component, causing loss of strength and ultimate disintegration.

In practical terms, oxychloride cement floors are unaffected by periodic mopping and hosing down common to kitchens, galleys, etc., and there are countless installations to prove the point. In addition, oxychloride has had a successful 30-year experience record for exterior stairs and decks in California.

The following wet-place uses are not recommended:

1. Outside locations in areas with more than 40 in. of annual rainfall.
2. Under commercial kitchen dishwashers.
3. Over on-grade Portland cement slabs in extremely wet areas (waterproofing techniques are not sufficiently dependable to prevent capillary ground moisture from softening or discoloring the floor).
4. Outside locations subject to the freeze-thaw cycle (we are putting in some test balcony decks using the California techniques to double-check this).
5. In food processing plants where floors are continually wet.

Oxychloride cement floors are alkaline in nature and continuous exposure to fruit acids, battery electrolytes, etc., will dissolve the cement.

Durability

Oxychloride cement flooring has a long life expectancy. It does not generally "wear out" under normal conditions of use. Abrasive action alone will seldom cause extreme undue wear. Faulty maintenance or improper applications account for most failures. The best evidence of durability is a successful over-the-years history.

Resurfacing

Resurfacing a floor is easy to accomplish, particularly for a terrazzo installation. The usual terrazzo finish grinding techniques will restore a floor to its original beauty and luster. A trowel-finish floor will usually not need resurfacing. Usually a thorough cleaning and resealing suffices. Failing this, a light grinding plus a penetrating sealer is used to resurface such a floor.

Specifications

A.S.A. specs have been set up for the various types of oxychloride flooring. Following are condensations of some sections of the standard covering general purpose oxychloride floors which should be especially noted:

1. *Materials.* The ingredients shall consist of caustic-calcined magnesia, inert fillers, such as silex, marble flour, asbestos in quantities not over 5 per cent of the weight of the dry mix, wood flour, sawdust, and talc in quantities not over 3 per cent of the weight of the dry mix; inert aggregates (which are not affected by cleaning compounds), such as sand, fine crushed stone, or other fine, chemically inert, low-absorbent, physically strong aggregates; and inorganic pigments (optional).

2. *Materials.* The use of premixed dry ingredients that have become lumpy shall not be permitted.

3. *Materials.* The gauging solution shall be a water solution of magnesium chloride. The specific gravity of the gauging solution shall be 22.0 ± 0.5° Baume at 70 F.

4. *Packaging.* All dry, premixed compositions shall be packaged in suitable containers and kept under adequate conditions to prevent damaging moisture pick-up. When aged longer than 60 days from date of mixing, the composition shall be tested, not more than 10 days before using.

5. *Mixing.* The premixed dry ingredients shall be placed in a clean mortar box or a clean mechanical mixer, the specified gauging solution added in an amount corresponding to not less than 5.0 lb MgO in the dry mix per gallon of gauging solution (not more than 0.20 gal of gauging solution per pound of MgO), and the mass mixed until it is free of lumps. In no case shall the material be retempered for use by addition of gauging solution after it has become too stiff to be applied.

6. *Working temperature.* In spaces where the floor is to be laid, the temperature shall be not less than 50 F and not more than 95 F until final set is attained. The prevailing temperature shall be maintained substantially uniform in a stipulated range and shall not decrease more than 20 F from the temperature at the time of installation for at least 24 hr after placing.

7. *Application.* After preparation of the subfloor surfaces, a thin layer of the flooring composition shall be thoroughly worked into all recesses and depressions by scraping with a trowel immediately prior to spreading the flooring mix. The flooring composition shall then be spread to the specified thickness, leveled by darbying, and finished by means of at least two steel trowelings. The final troweling shall be delayed until the composition has acquired sufficient set so that this operation (hard troweling) will produce a smooth floor or uniform color and a dense glaze, free from laitance.

8. *Thickness.* The thickness of each coat of the floor at any point shall conform to the following requirements:

	Min	*Max*
On Oxychloride Composition basecoat, type 1	3/8	3/4
On wood subfloors	5/8	3/4
On concrete subfloors	1/2	1
On all other subfloors	5/8	1

9. *Sealing.* The floor shall be thoroughly cleaned after final set so that it is free from all foreign materials, laitance, etc., and shall be sealed with a low-viscosity sealer that will maintain a low viscosity after at least 30-min exposure in the form of a thin film to a normal atmosphere at a temperature of 80 F. The floor surface shall be wet with an excess of the penetrating sealer for at least 30 min, after which the excess sealer shall be removed from the surface by means of rags or mop, or by means of sawdust spread over the floor surface to absorb the excess sealer.

For more information circle selected item numbers on Readers Service Inquiry Card, Pages 319-320

NEW TECHNIQUES WITH ARCHITECTURAL MODELS

Topofoam is the name of a new method of site reproduction which uses low density polyurethane to make topographical models. Architects supply topographical maps and the model is formed from a single block of polyurethane. A wide range of elevations can be reproduced to any scale required. Advantages of the new system are speed, accuracy, durability and suitability to any kind of finish. Each project is priced according to the complexity of the site map, but costs are said to be reasonable. *Topofoam, 939 Madison Ave., New York 21, N.Y.*

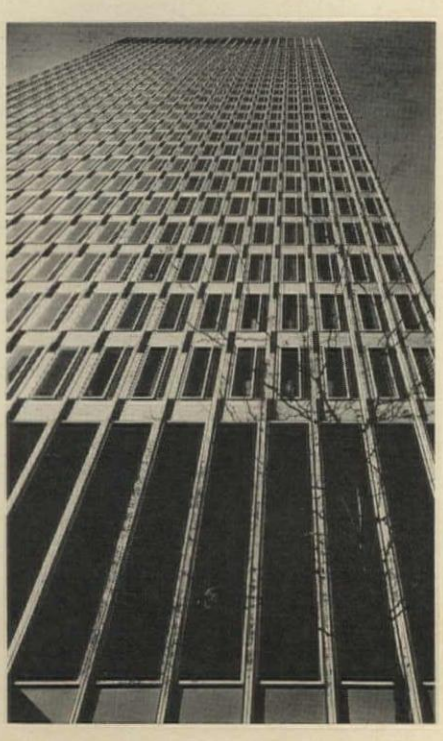
CIRCLE 300 ON INQUIRY CARD

Designed and developed by Paul Kenworthy, a former Walt Disney director, this "snorkel" camera (*right*) is being used to make realistic motion pictures of architectural models.

The camera consists of an optical tube more than 2 ft long, and comprised of mirrors and prisms hanging from a ceiling camera and moving extremely close to the ground level of the model. The operator manipulates the tube, which can penetrate and move with a minimum required clearance of 1 in. A closed circuit television monitoring board supplies constant viewing while filming.

The view reproduced on film—from a scale of $\frac{1}{16}$—is what would be seen by a 6-ft man walking through the streets and around the buildings. Thus at model stage a vivid impression is given of the whole feeling and atmosphere of the finished scheme. The camera was developed at the suggestion of Vincent Kling for the Philadelphia redevelopment scheme, but is now being used by other architects. *On Film, 625 W. 42nd St., New York, N.Y.*

CIRCLE 301 ON INQUIRY CARD



MATTE FINISH FOR PORCELAIN ENAMEL STEEL PANELS

Demands for a more natural appearance for offices and industrial buildings have prompted the Porcelain Enamel Institute to introduce a new porcelain enamel matte finish for architectural steel panels. Sixteen preliminary colors have so far been introduced in the *Nature-Tone* range, including grays, greens, browns and blues. Tests indicate that the new matte finishes fall mainly in the 10 to 20 gloss unit range, as compared to between 45 and 60 gloss units for existing porcelain enamels. Vincent Kling's Blaustein building (*left*) features porcelain enamel matte steel panels in tones of brown, green and gray. *Porcelain Enamel Institute, 1900 L St., N.W., Washington D.C., 20036*

CIRCLE 302 ON INQUIRY CARD

REFLECTIVE COATING FOR WINDOW GIVES ENVIRONMENTAL CONTROL

The *Solarban Twindow* is a significant development in the field of environmental control. A dry air space between two panes of glass insulates against heat loss by conduction, while a special reflective coating applied to the air space side of the indoor pane reduces radiant heat loss. The combination of air space and reflective surface results in a U value of .35 as compared to .60 for conventional double-glazed insulating units. Tests on the *Solarban Twindow* show the maximum heat gain from the sun's radiant energy under standard conditions, to be 65, as against 170/Btu/hr/sq ft for the conventional double-glazed unit. *Pittsburgh Plate Glass Co., Pittsburgh, Pa.*

CIRCLE 303 ON INQUIRY CARD

more products on page 244

Office Literature

For more information circle selected item numbers on Reader Service Inquiry Card, pages 319-320

BUILDING PRODUCTS CATALOG

More than 50 different ventilators, range hoods, attic and exhaust fans, and accessories are featured in a new building products catalog No. 1-C7. Specifications and dimensions are given for each product, together with illustrations of the various components. *Fasco Industries, Inc., Augusta and North Union, Rochester, N.Y., 14602*

CIRCLE 400 ON INQUIRY CARD

VERSATILE SUB FLOOR STRUCTURE

Steel cellular sub-floors are described in catalog M-65 entitled "Mahon-M Floors." This new ready reference technical digest describes the advantages of these systems in air and electrified floor construction. Section descriptions, properties requirements and tables, load tables, specifications and electrical details are given. Various methods of air distribution are also discussed. The text is illustrated with diagrams and photographs. *R. C. Mahon Company, Building Products Div., 6565 E. Eight Mile Road, Detroit, Mich., 48234**

CIRCLE 401 ON INQUIRY CARD

SEATING CATALOG

A handsome 16-page fold-out catalog describes the company's line of office chairs and reception seating. Forty-four models are shown in the catalog. Dimensions and a photograph are included for each product. *Costa Mesa Furniture Co., 411 East Julianna St., Anaheim, Calif.*

CIRCLE 402 ON INQUIRY CARD

GUIDE FOR SELECTION OF SOUND CONTROL PARTITIONS

U.S. Gypsum's new pocket sized slide chart was designed to provide an easy method of selecting suitable interior partitions for use as sound control elements in building construction. When the arrow is pointed to a specific USG partition system, a panel on the selector indicates the product's sound rating, fire rating, weight, thickness, details of component parts and other relevant information. *Dept 122, United States Gypsum Company, 101 S. Wacker Dr., Chicago, Ill.**

CIRCLE 403 ON INQUIRY CARD

ALUMINUM IN FARM BUILDINGS

Two brochures, "Alcoa Aluminum Farm Roofing and Siding" and "Simplified Aluminum Clear Span Farm Building" have been revised to include information on recent advances in the use of light metal for agricultural structures. Details are given of the company's five types of aluminum roofing and siding sheets designed especially for a wide variety of farm uses. The clear span brochure outlines simplified methods of installing poles around the perimeter of a structure and framing the building. The booklet points out that the advantage of this system is that it permits the full covered area to be used without interference from interior load bearing poles. *Aluminum Company of America, 634 Alcoa Building, Pittsburgh, Pa.**

CIRCLE 404 ON INQUIRY CARD

THE SCOPE OF PREFABRICATION

Prefabricated buildings of many different types in a wide variety of locations are illustrated in a 24-page colored brochure. Supermarkets, industrial plants, office buildings, laboratories, country clubs, churches, schools and department stores are among the buildings illustrated. Some of the illustrations are selected to emphasize particular details of the company's wall and structural systems. *Butler Manufacturing Company, 7400 East 13th St., Kansas City, Mo., 64126*

CIRCLE 405 ON INQUIRY CARD

GLASSHOUSES

The *IBG DomeSystem* in some of its wide range of applications is eloquently portrayed in a beautifully produced brochure. The system, which consists of three basic components—aluminum tubular structural member, a cast aluminum connector and selected exterior covering—can be used for an extensive range of functions from swimming pool enclosures to airport control towers. Photos, drawings and specifications are included. *Ickes-Braun Glasshouses, 1733 N. Western Ave., Chicago, Ill.**

CIRCLE 406 ON INQUIRY CARD

LIBRARY FURNITURE

A comprehensive selection of library furniture in both contemporary and traditional designs is displayed in a new catalog No. 15. Charge desks, card catalog cabinets, reading desks, shelves of all kinds are shown as well as a line of juvenile library furniture. *Bro-Dart Industries, 56 Earl St., Newark, N.J., 07114*

CIRCLE 407 ON INQUIRY CARD

FURNITURE DESIGNS

Table tops and bases, sectional tables, chairs, couches and bar stools are among the items described in Chicago Hardware Foundry Company's new design file. Each sheet in the file was designed to give designers and architects a working illustration of each item with variations of design, finishes and prices on the back. *Chicago Hardware Foundry Co., North Chicago, Ill.*

CIRCLE 408 ON INQUIRY CARD

HOT WATER SUPPLY CATALOG

A new 12-page catalog describes the company's complete line of hot water supply boilers, water heaters, storage tanks and allied equipment. New design features incorporated in the *Raytherm* and *Coppertherm* boiler lines are included in the brochure. Tables are printed to show pressure drops to be expected for each size boiler at 10, 20 and 30 deg temperature rise. *Raypak Company Inc., 2430 Chico, El Monte, Calif.*

CIRCLE 409 ON INQUIRY CARD

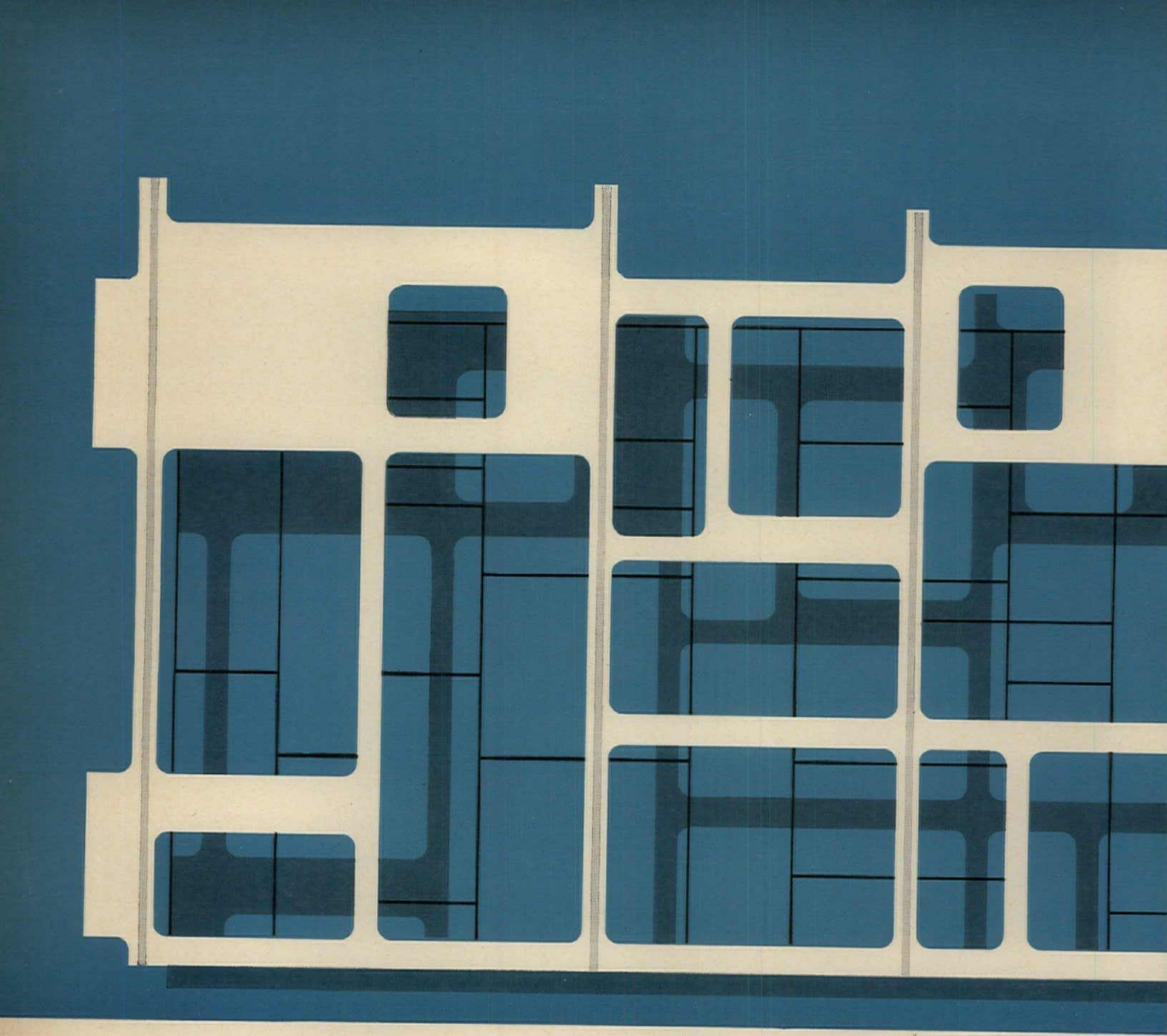
STEEL GRANDSTANDS

The *Type BC-Open-Deck* and the *Type BP-Closed Deck* permanent steel grandstands are described in an illustrated brochure. Both types are available in elevated or non-elevated styles, in any length and any number of rows desired. The units are said to be particularly suitable for planned expansion programs because the basic grandstand can be made deeper and longer without undue difficulty or expense. *Wayne Iron Works, Wayne, Pa.*

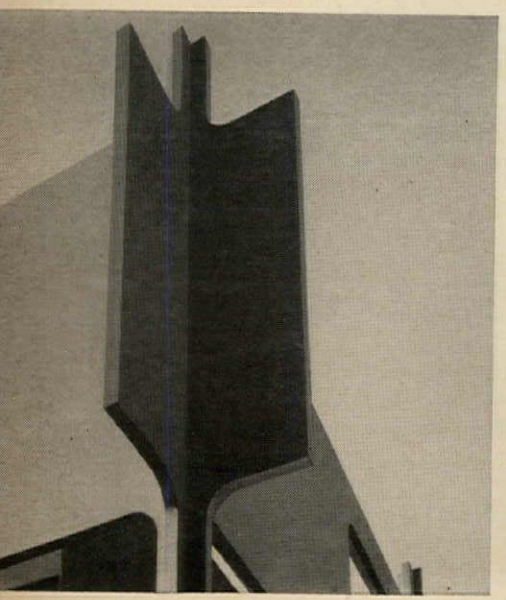
CIRCLE 410 ON INQUIRY CARD

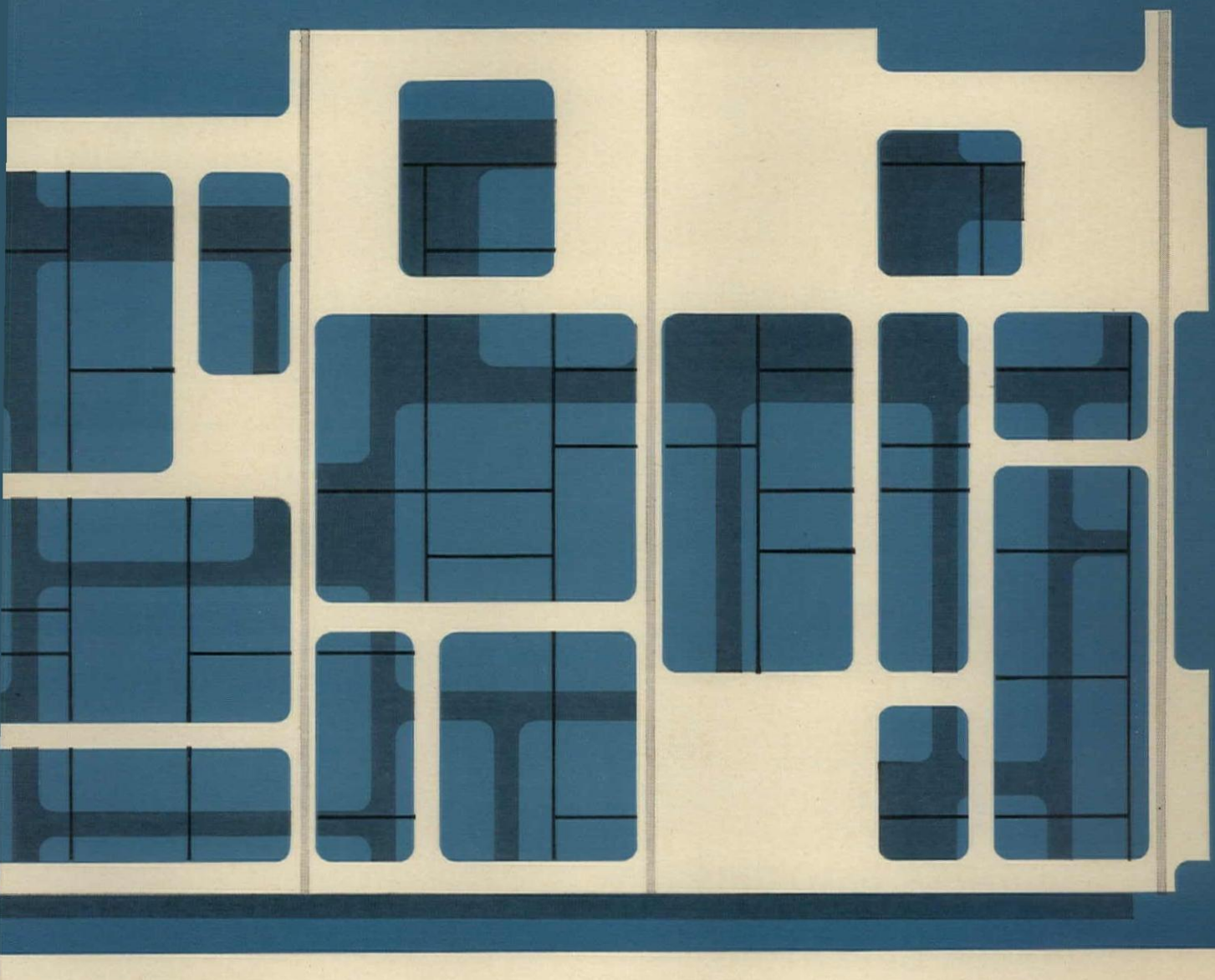
**Additional product information in Sweet's Architectural File*

more literature on page 294



the most exciting ideas take shape in plywood



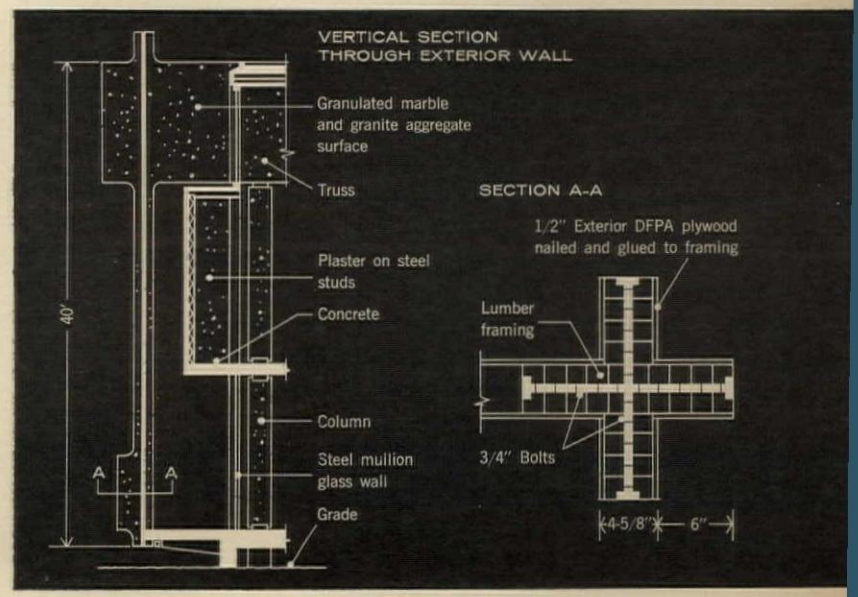


Tyrone Guthrie Theater, Minneapolis, Minn. / Architect: Ralph Rapson, A.I.A., Architects, Inc. / Structural Engineers: Meyer & Borgman / Contractor: Watson Construction Co.

This unusual screen forecasts the mystery and excitement to be found within the theater itself. And it is a good example of how plywood can help achieve unusual design effects without exaggerating costs. The screen is composed of thin sheets of Exterior DFPA plywood nailed and glued to a lumber frame. This construction – which works like a stressed skin panel – is light, strong and very low-cost. In fact, plywood cost less than steel, metal lath and plaster, or solid laminated wood. For more information on plywood structural systems, write us at Tacoma, Washington 98401 (USA only).

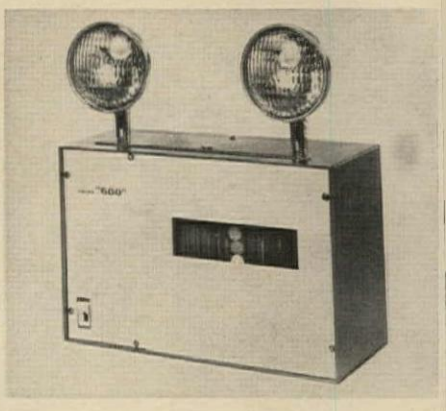
AMERICAN PLYWOOD ASSOCIATION

DFPA



Product Reports

continued from page 244



EMERGENCY LIGHTING

The new *Series 600* emergency lighting unit has been designed for use where small size and attractive appearance are important requirements. *Teal Industries Inc., 118 Quinnipac Ave., North Haven 2, Conn.*

CIRCLE 305 ON INQUIRY CARD

AIR CONTROL BOOSTER

Quiet vibrationless operation, plus positive air control in the form of a single pump design is the main feature of the new *B&G* air control booster. The pump incorporates a special air control system, which eliminates the need for an air separator at the boiler. Water entrained air bubbles are effectively separated within the pump and directed to a collection chamber on the front of the body. The compression tank is directly connected to the air collection chamber, allowing free air to rise to the tank. When used in conjunction with a special *EX-ES* air valve, compression tank size can be reduced by 50 per cent over conventional tank sizing methods. *ITT Bell & Gossett Hydronics, Morton Grove, Ill.*

CIRCLE 306 ON INQUIRY CARD

more products on page 252

The only thing more reliable than your Kohler Distributor is your Kohler Electric Plant itself!

The Kohler Electric Plant Distributor who serves you has the plant, the personnel and the product to make sure all your requirements are quickly and properly fulfilled. He has Kohler-trained people in his own organization, he has Kohler factory personnel available to assist in providing the service and the counsel that give you more from your Kohler equipment.

Most important is the line of Electric Plants offered by your Kohler Distributor. Kohler plants range from 500 to 175,000 Watts. They are fully adaptable to any power source need, are made in portable, portable-mobile and fixed position models. They are completely built, assembled and tested in the Kohler factories. For full information see your Kohler Distributor.

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- ✓ **One source responsibility**—the Kohler name, reputation and experience stand behind the complete plant.
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- ✓ **Nationwide sales and service**—one source service from a network of fully staffed, fully equipped Kohler Distributors.
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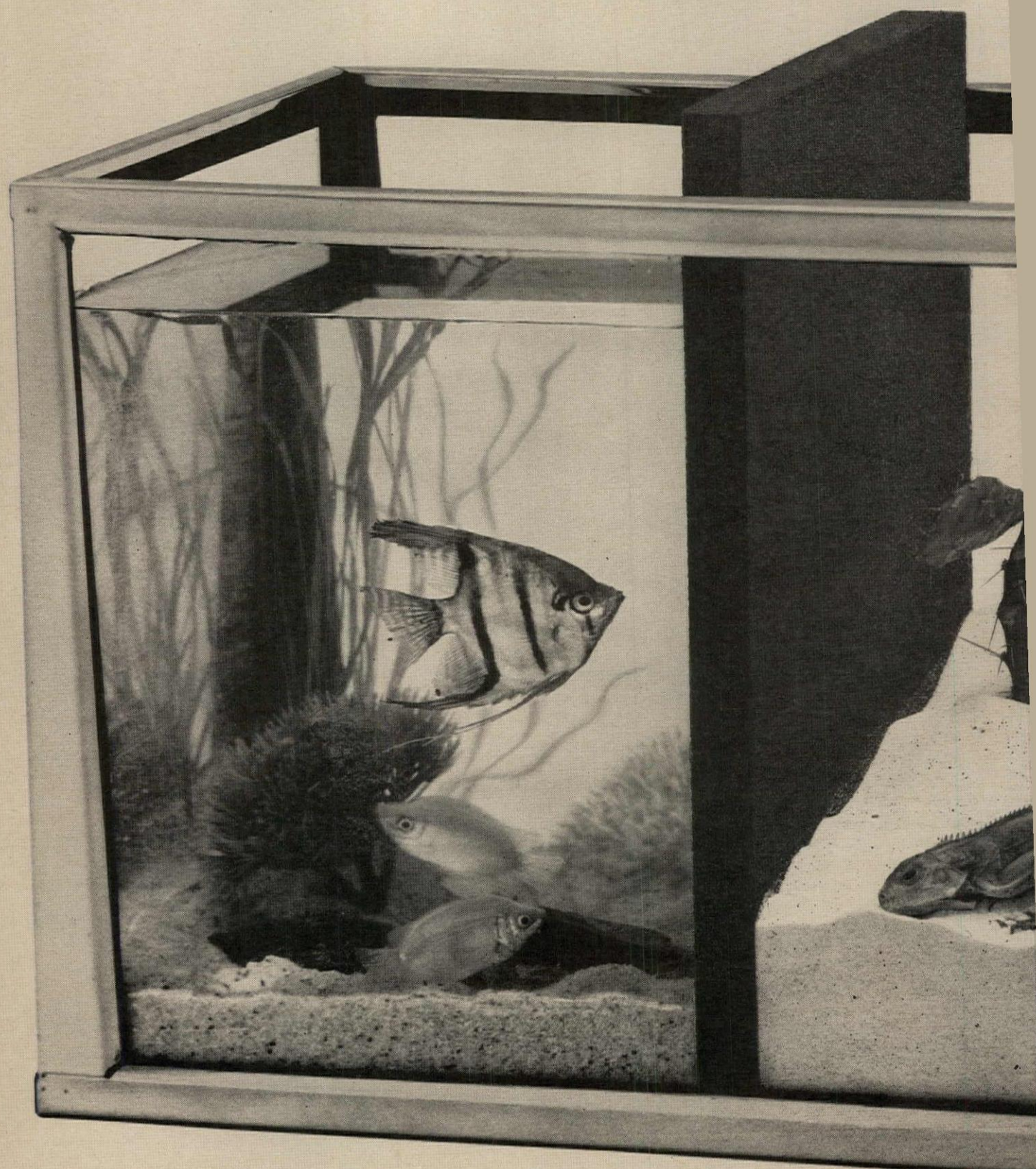
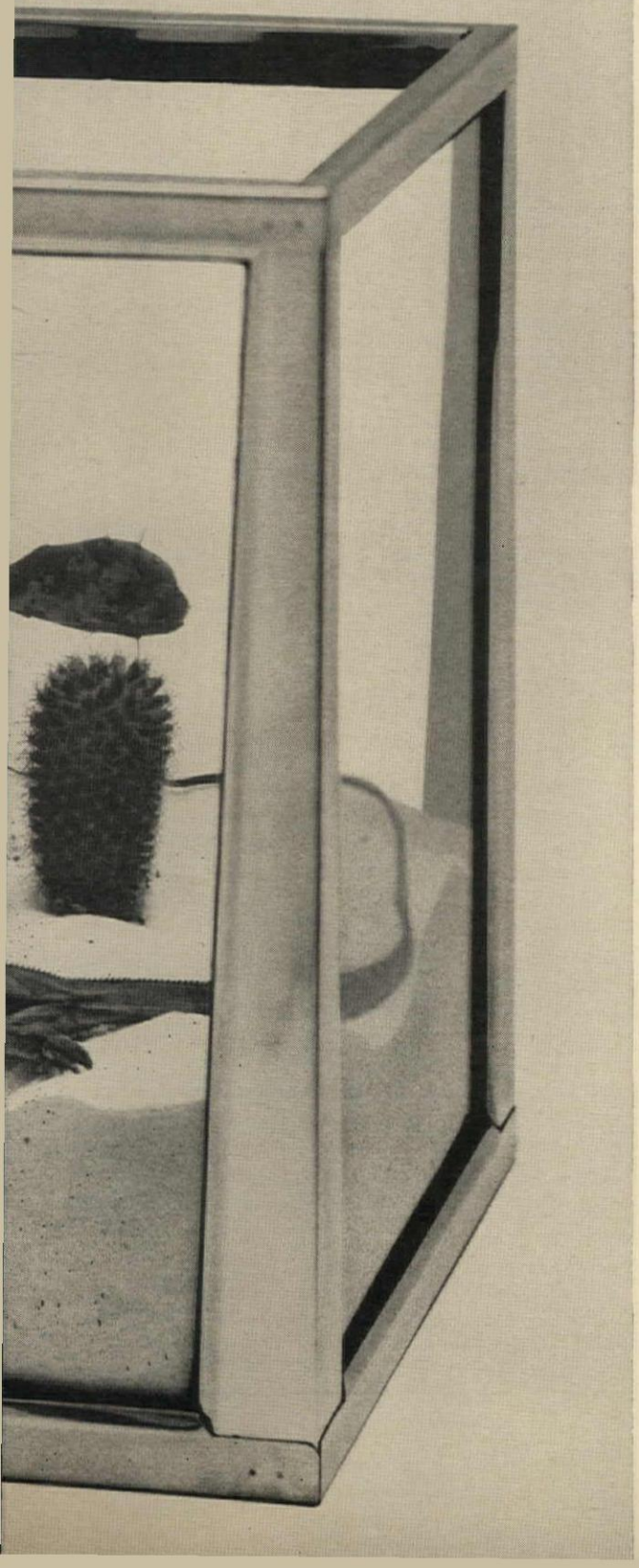
For more data, circle 132 on Inquiry Card

Here's the proof in waterproof FOAMGLAS®





The only roof insulation that can keep the aquarium from watering the cactus

We named it an aquaterrium. An aquarium on one side . . . a terrarium on the other. It may be the only one in the world. We built it to demonstrate that Pittsburgh Corning's FOAMGLAS cellular glass insulation is absolutely waterproof.

FOAMGLAS will never let the water through to drown the cactus. A cactus doesn't like water . . . and neither does your insulation.

Once your FOAMGLAS Roof Insulation is down, our 20-year guarantee protects your client. We can make that guarantee because FOAMGLAS stays dry and always keeps its original insulating efficiency. FOAMGLAS permeability (moisture absorption) is zero. No other roof insulation makes this claim.

A new feature of FOAMGLAS®-BOARD roof insulation is the small bevel on each 4′ bottom edge of the board. These beveled edges provide a vapor pressure escape channel for moisture trapped between insulation and deck. The elimination of pressure build-up reduces wrinkling and blistering of the roofing.

Investigate the only waterproof roof insulation . . . available in 2′ x 4′ bevel edge FOAMGLAS-BOARD in thicknesses of 1½″, 1¾″ and 2″.

Foamglas® cellular glass insulation is manufactured and sold in Western Europe by Pittsburgh Corning de Belgique, S.A., Brussels.

PITTSBURGH PC® CORNING

PITTSBURGH CORNING CORPORATION, DEPT. AR-45
ONE GATEWAY CENTER, PITTSBURGH, PENNA. 15222

Gentlemen: I'm interested in the FOAMGLAS waterproof story. Please ☐ send free sample of FOAMGLAS-BOARD; ☐ send copy of sample guarantee; ☐ send literature; ☐ have your representative call.

NAME_____ TITLE_____

FIRM_____

ADDRESS_____

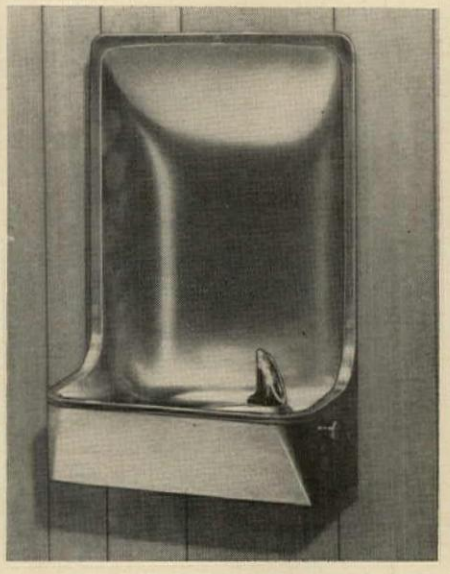
CITY_____ STATE_____ ZIP_____

Product Reports

continued from page 248

STAINLESS STEEL DRINKING FOUNTAIN

Haws *model 23* semi-recessed drinking fountain is die-stamped in 20 gage stainless steel, and includes a metal mounting frame to expedite in-the-wall and off-the-floor installation. The sanitary angle stream bubbler is



activated by a self-closing push-button valve, with self-regulating volume and pressure controls. The *model 23* measures 25 in. high by 16¾ in. wide, and projects 8¾ in. from the wall. *Haws Drinking Faucet Company, Berkeley, Calif.*

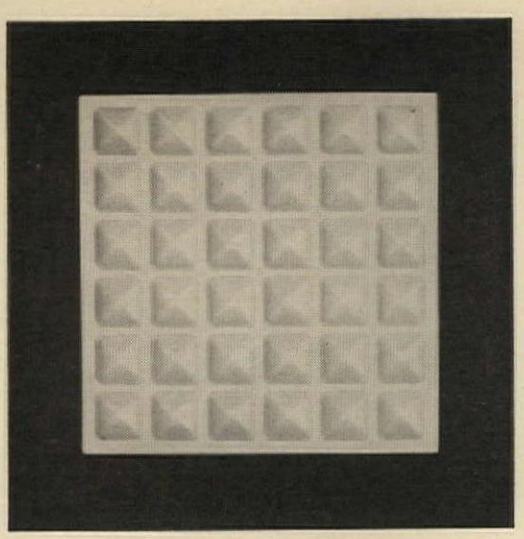
CIRCLE 307 ON INQUIRY CARD

ELECTRIC RADIANT HEATING SYSTEM

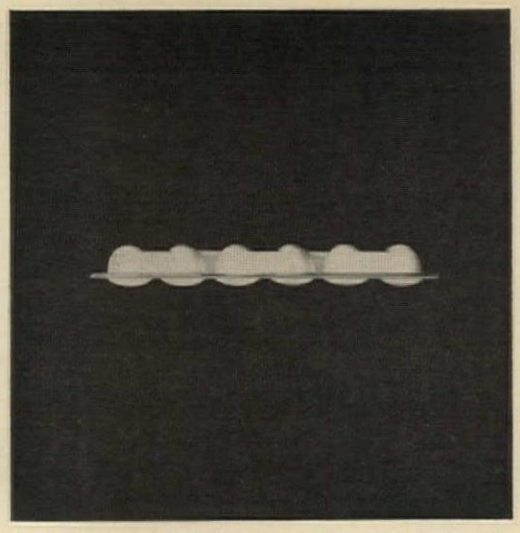
The *Thermalux* electric radiant heating system makes use of ceiling heating panels each of which consists of a large area electrical resistor and a sheet of gypsum board. The chief advantage of the system is that it combines a low operating temperature of 100 deg F or lower with a heat output of 15 watts per sq ft. The panels are 4 ft wide and are available in standard lengths to 12 ft. The system makes possible individual room temperature control, as each room has its own independent heating system. *United States Gypsum Company, 101 South Wacker Drive, Chicago, Ill.*

CIRCLE 308 ON INQUIRY CARD

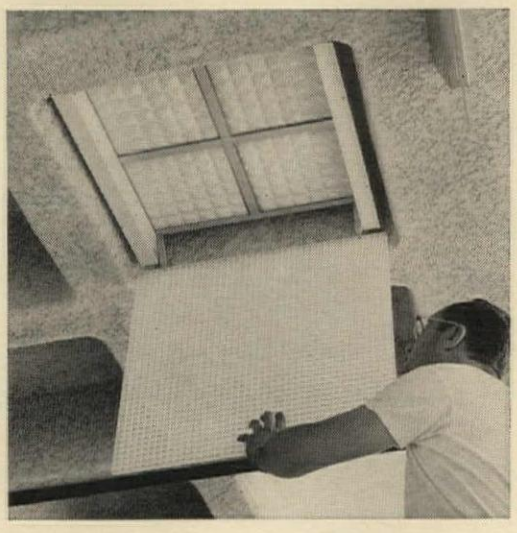
more products on page 258



It's square



It's thin



It's versatile

It's the General Electric Panel Fluorescent lamp

New. The Panel Fluorescent lamp from General Electric. A thin one-foot square of light. A beautiful lamp designed to match the modules of today's contemporary applications.

New. A versatile "area source" for concentrated light. The Panel F lamp is an efficient light source that fits square or rectangular ceiling modules, such as poured concrete coffered ceilings. A new way to create striking lighting effects without sacrificing pleasing ceiling patterns.

New. The Panel Deluxe color. A deluxe warm color without the usual loss of efficiency. Panel Deluxe delivers 4200 lumens (95% of the output of Cool White) of rich, flattering light and provides good color rendition.

Now. Available from your General Electric Large Lamp Agent. Many commercial fixtures for the Panel F lamp are now available, too. Find out how you can use the Panel Fluorescent lamp to add a touch of luxury to offices, corridors and other business areas. Write General Electric Company, Large Lamp Department C-512, Nela Park, Cleveland, Ohio 44112.

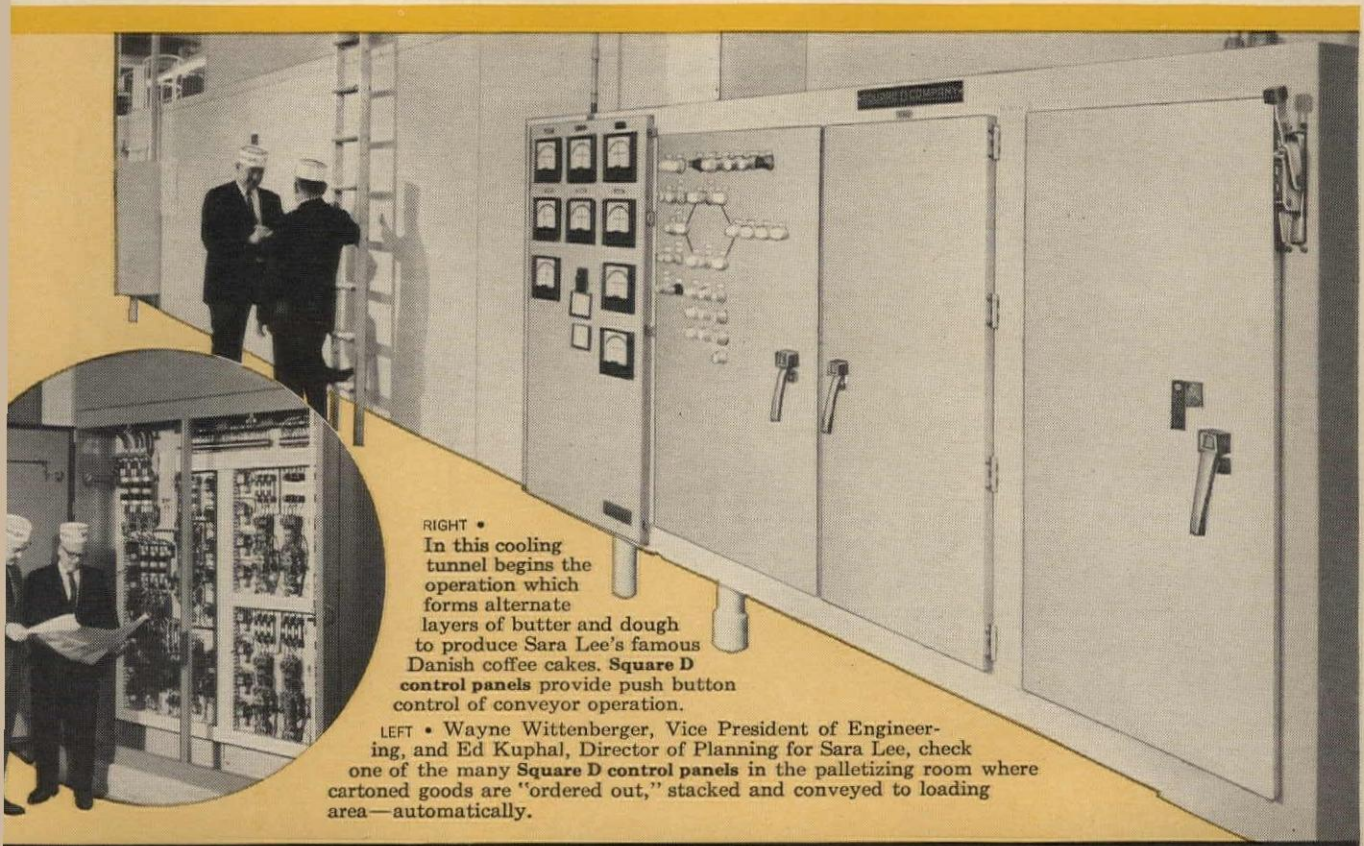
Progress Is Our Most Important Product

GENERAL ELECTRIC

For more data, circle 134 on Inquiry Card

ctricity is distributed and controlled

s enhanced by the ultimate in nd Quality Control



RIGHT • In this cooling tunnel begins the operation which forms alternate layers of butter and dough to produce Sara Lee's famous Danish coffee cakes. **Square D control panels** provide push button control of conveyor operation.

LEFT • Wayne Wittenberger, Vice President of Engineering, and Ed Kuphal, Director of Planning for Sara Lee, check one of the many **Square D control panels** in the palletizing room where cartoned goods are "ordered out," stacked and conveyed to loading area—automatically.

EXECUTIVE OFFICES • PARK RIDGE, ILLINOIS

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Quarry Tile of Special Shapes

The unique beauty of Ludowici special shapes shale flooring tile is now practical for your most budget minded client. Because of greatly increased demand, price reductions have been made on all special shape styles. No difference in quality or texture.

You can now afford the world's most beautiful flooring tile.

Provence, Valencia and Renaissance patterns available in brushed or smooth, in red or fire flashed colors.

For complete information and the name of your nearest distributor write:
FLOORING TILE DIVISION—Dept. A. R.

LUDOWICI-CELADON CO. • 75 East Wacker Drive, Chicago 1, Illinois
Manufacturers of quarry tile, the nation's largest producer of roofing tile and NAILON Facing Brick

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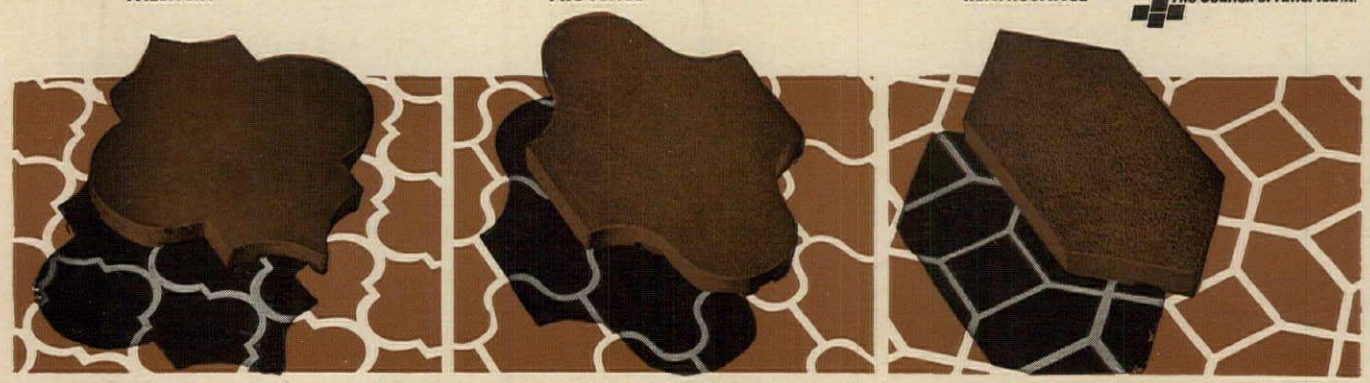
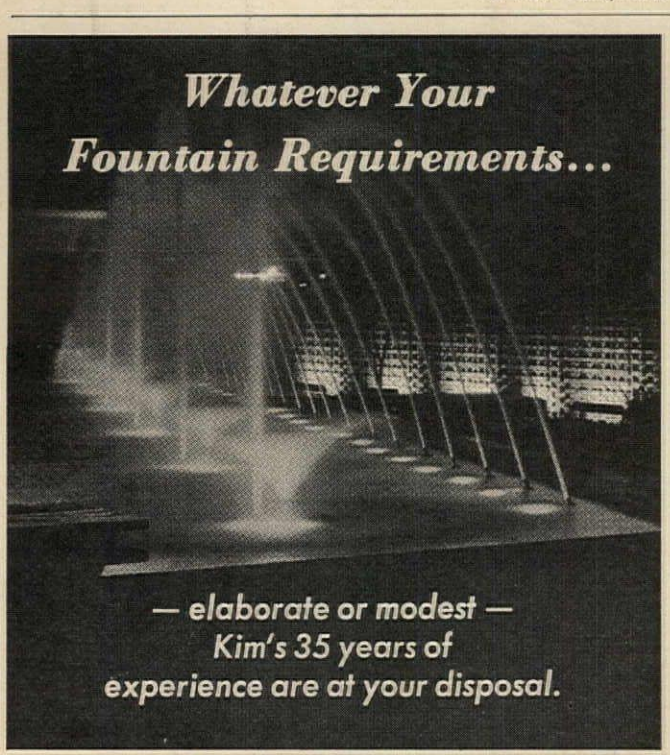
VALENCIA **PROVENCE** **RENAISSANCE**



For more data, circle 137 on Inquiry Card



See **Sweets 39/E** or, better yet, see our 26 min. color/sound motion picture: **"Report on Fountain Design."** Write:

kim

KIM LIGHTING & MANUFACTURING COMPANY, INC.
1467 NO. LIDCOMBE EL MONTE, CAL. CU-3-7621
Manufacturers of display fountains, landscape, swimming pool and mall lighting.

For more data, circle 138 on Inquiry Card

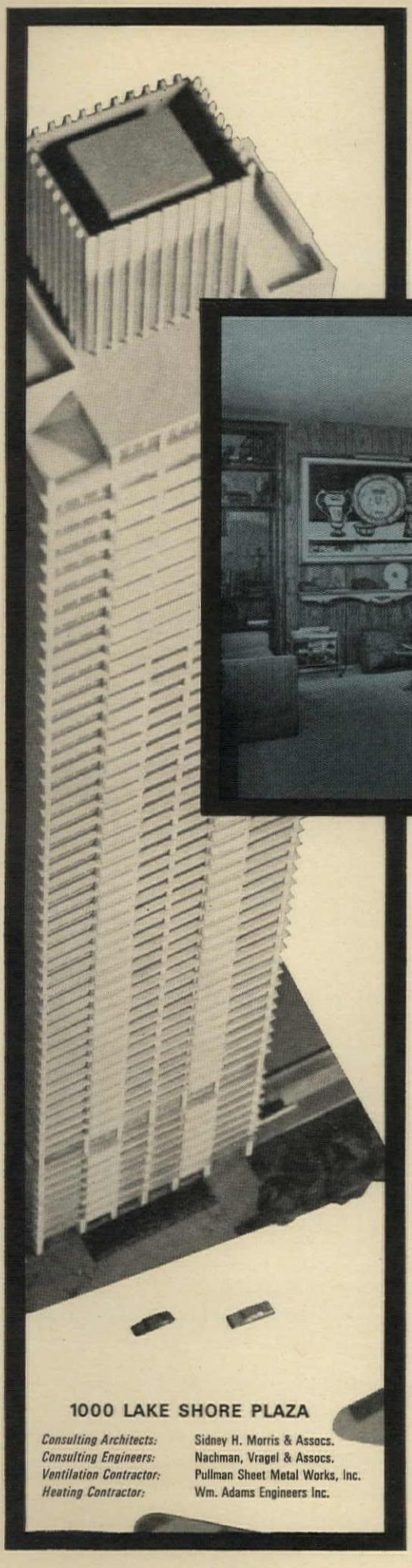
BEAUTY—BUILT TO LAST
Howell's New
"Dividend Line" Furniture

The Danish accent of curved walnut-finished hardwood arm rests sets off this beautiful new Howell contemporary group. The chairs, in regular or high-back style, have reversible molded foam cushions upholstered in Naugahyde, secondary spring slats under seat cushions and sturdy welded tubular legs. Chairs come in many colors and finishes, tables in many sizes and styles. Send for color catalog #28.

HOWELL *Modern Metal Furniture*
453 S. First St., St. Charles, Illinois

For more data, circle 139 on Inquiry Card

For more data, circle 140 on Inquiry Card →



1000 LAKE SHORE PLAZA

Consulting Architects:	Sidney H. Morris & Assocs.
Consulting Engineers:	Nachman, Vragel & Assocs.
Ventilation Contractor:	Pullman Sheet Metal Works, Inc.
Heating Contractor:	Wm. Adams Engineers Inc.

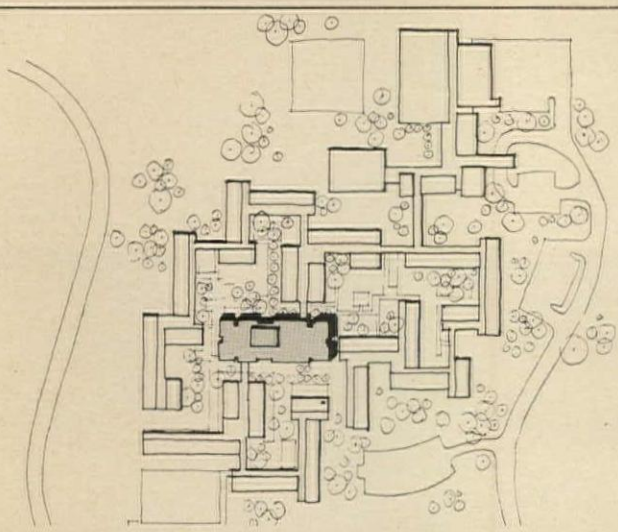
Life of luxury... 610 *feet above everybody!*

Tenants in the world's tallest apartment building, 1000 Lake Shore Plaza on Chicago's Gold Coast, get the best of everything . . . including *Bohn-Aire* heating and cooling. ■ Each tenant enjoys his own dual zone system with thermostatic control and choice of heating or cooling in each zone. ■ Baseboard radiation blankets outside walls and window areas, providing required heat until weather goes below freezing. Then, the *Bohn-Aire* system, with its steam reheat coils, furnishes the balance of heat needed to maintain perfect comfort. ■ For cooling, chilled water is supplied to each apartment's individual air handling unit. Zone thermostats in the sleeping and living areas operate modulating steam valves on the zone reheat coils to maintain desired temperatures. ■ *Bohn-Aire* apartment units are designed with quietness in mind, with slow speed double inlet, double width fans sized to operate against external static pressure. Capacities: 200 CFM to 2,000 CFM. ■ **Request Bulletin 461 from your BOHN rep, or write:**

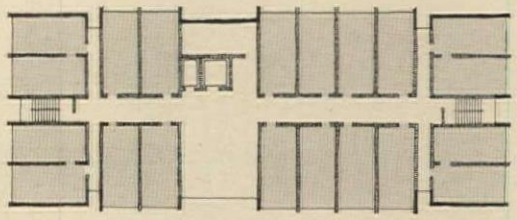
BOHN
ALUMINUM & BRASS COMPANY
Heat Transfer Division • Danville, Illinois
A DIVISION OF **UNIVERSAL** **AMERICAN** CORPORATION

For more data, circle 156 on Inquiry Card

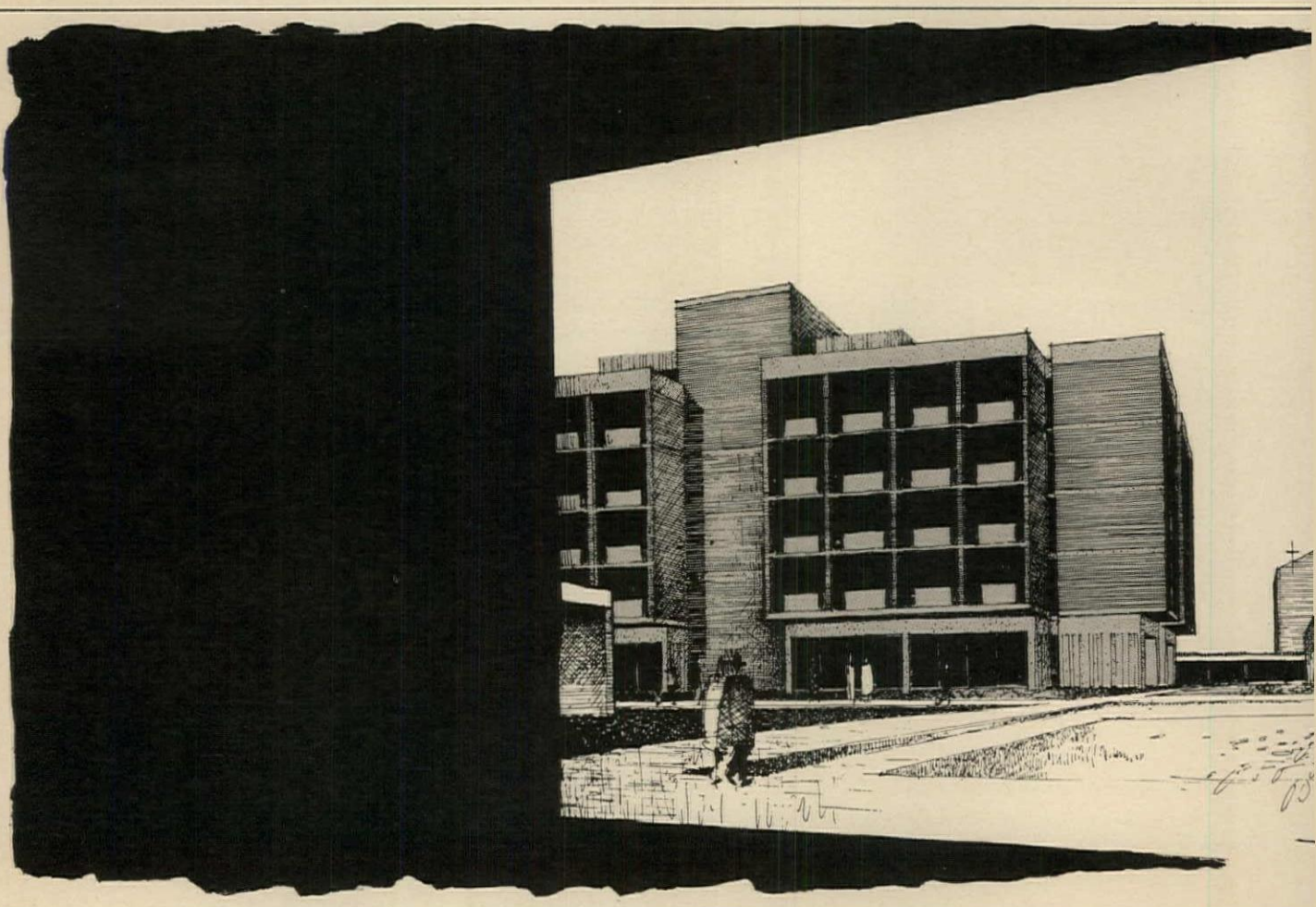
THE CONTEMPORARY CLAY BEARING WALL as designed by Gyo Obata, AIA

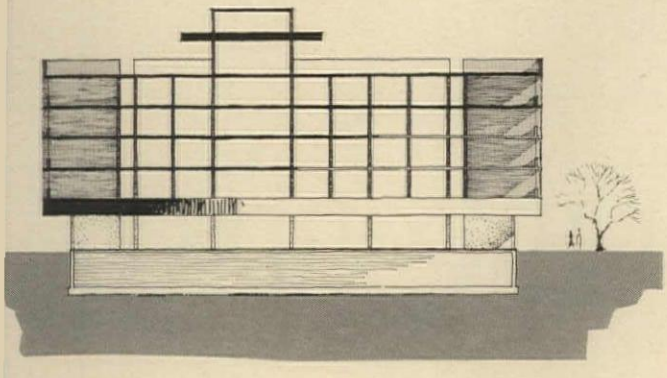


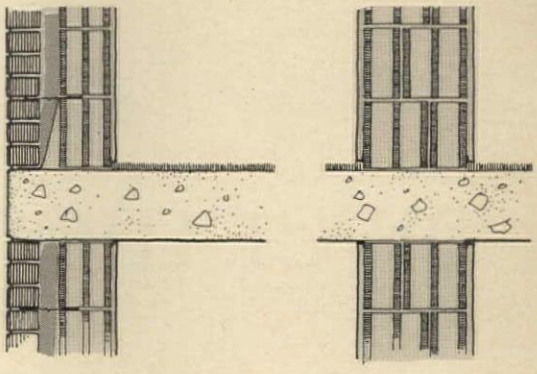
Our goal in designing the Apartment Community of Our Lady of the Snows was to create a self-sufficient community in which retired persons might live in dignity and comfort in beautiful surroundings. We were given 11 acres on the crest of a hill on the 200-acre site of the National Shrine of Our Lady of the Snows near Belleville, Illinois, to plan residential accommodations for 250 persons. To provide beauty, privacy, and a pleasant scale, we created a cluster of single-story cottages grouped around landscaped courtyards and connected to a central five-story structure.



The five-story building was designed to house recreational facilities on the lobby floor with 64 small apartments above. This is the plan for the 2nd, 3rd, 4th, and 5th floors. The nature of the project, the desire for a workable scale, and the need for visual and acoustical privacy suggested the use of clay products for walls and corridors. This became a definite decision when we considered the compressive capabilities of brick and tile and the economies possible in a load-bearing masonry structural system. All of the hatched walls shown here are bearing walls of structural clay tile. Corridors and stair wells are faced with exposed brick. Other interior walls are plastered and painted. All are 12 inches thick. Exterior walls at corners and in core areas, shown by heavy dark lines, are brick and tile cavity walls insulated with water-repellent vermiculite.

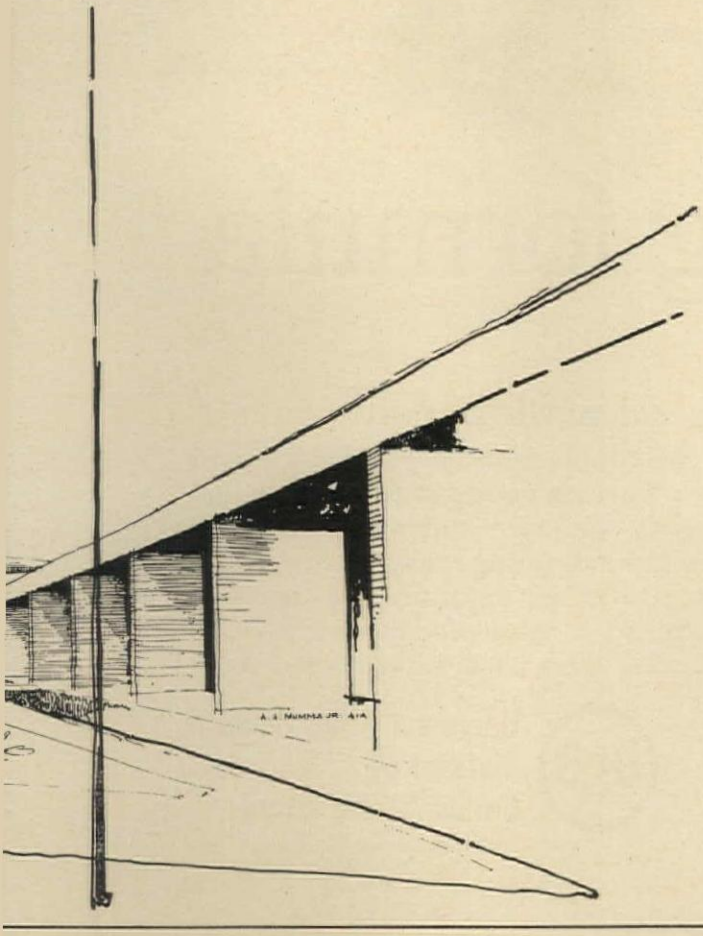






is section tells the rest of the story. The foundation is 12-inch ngitudinal bearing walls of structural clay tile resting on a concrete b. Concrete columns and beam support the first floor because we nted long clear spans for recreation areas and multipurpose rooms. ove are the structural tile bearing walls. Floors are poured-in-place ncrete slabs. In this case, we found them less costly than precast ors. Bearing walls and floor slabs project to reveal the structure.

At left is a detail of an exterior wall—4 inches of brick, 2 of vermiculite, and 6 inches of structural clay tile. At right is a detail of a typical interior wall; 4- and 8-inch tiles are alternated for maximum strength. In this particular case, we found the structural clay bearing wall system to be a natural and economical solution to our problems. It had the further virtue of offering functional and aesthetic benefits peculiar both to these materials and the needs of this project.

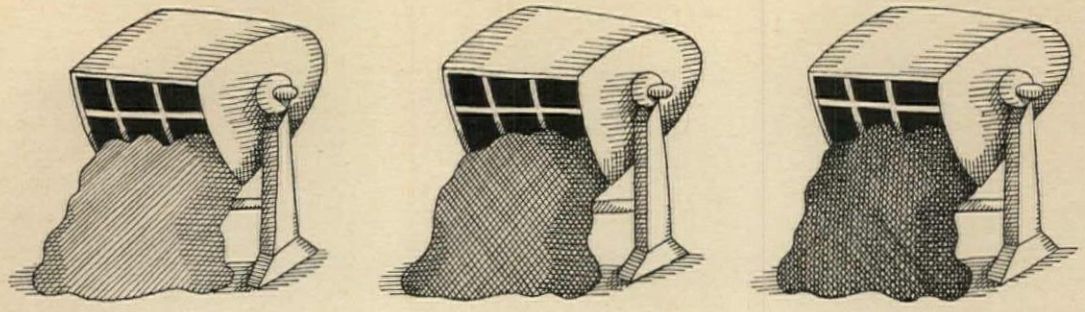


Project: **Apartment Community of Our Lady of the Snows**
Architects: **Hellmuth, Obata & Kassabaum**
Engineers: **The Engineers Collaborative**
Owner: **The Oblate Fathers**

BRICK:
For
Bearing
And
Beauty

Structural Clay Products Institute, 1520 18th St., N.W., Washington, D.C.

scpi



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Universal Atlas Cement
Division of
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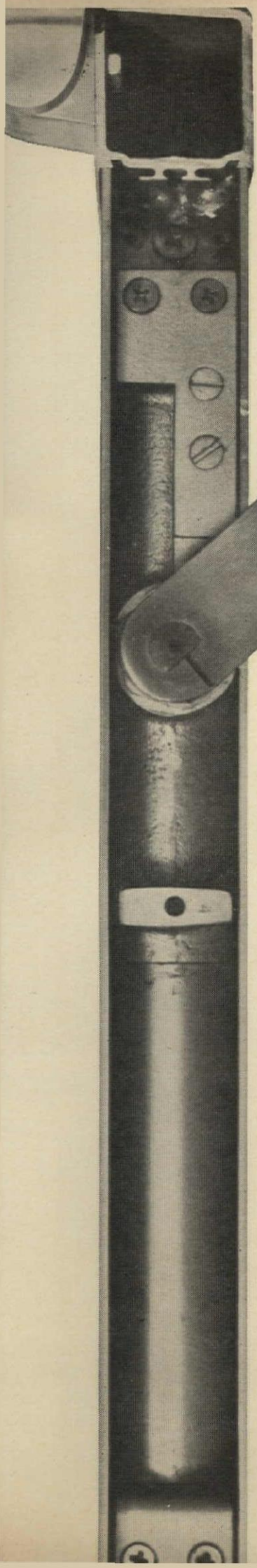
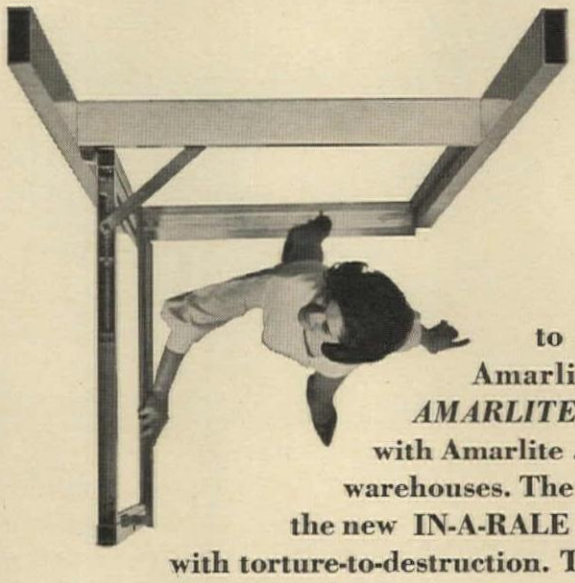


Exclusive in an Amarlite entrance... the new Invisible in-a-RALE closer



You may never see this new closer. That's the beauty of it. It's part of the door itself, installed in the Amarlite factory, and that saves a major part of field installation time . . . prevents errors too. The *exclusive* new IN-A-RALE Closer is ***invisible!*** Nothing to bulge or project to spoil the slim, trim lines of an Amarlite aluminum entrance. *ONLY AMARLITE HAS IT!* IN-A-RALE is *standard* with Amarlite . . . available through all Amarlite warehouses. The price is right! Equally important, the new IN-A-RALE closer has been tested for months with torture-to-destruction. Today, it operates under all conditions. It works!

IN-A-RALE has the features you want—fully concealed slide-type arm with hold-open (arm for 180° opening optional); adjustable hydraulic back-check; adjustable sweep speed and latching speed. Write or call for a demonstration, and your Amarlite representative will come a'runnin'!

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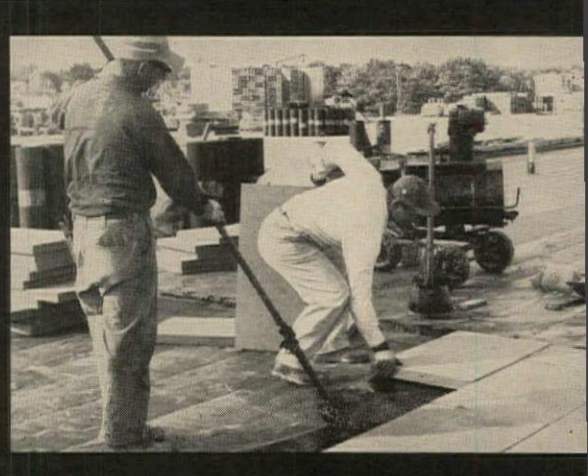
Sales Offices and Warehouses: Chicago, Cleveland, Dallas, Paramus, Atlanta, Los Angeles

PHYSICAL DATA

C (Conductance Value) 1″ Nominal Thickness: 0.36 ☐ Water Absorption (% by Volume): 1.5 @ 2 Hrs. Total Immersion (No Capillarity) ☐ Vapor Permeability: 15 Perms @ 73° F. and 51% Relative Humidity ☐ Concentration Load Indentation: 1/16″ @ 77 lbs. ☐ Compression Resistance: 185 PSI (50% Consolidation) ☐ Fungus Resistance: Complete ☐ Flame Spread: 25 (Non-combustible) ☐ Smoke Developed: 0—5 ☐ Wt./Sq. Ft./1″ Thick: 0.8 lbs. Approx.



Photomicrograph of cross section of a grain of flame-exploded perlite.

designed explosion

Born within
the intricate architecture
of a grain of
flame-exploded perlite
is the lightness,
the non-combustibility,
the moisture-resistance,
the thermal efficiency,
the compression resistance,
the permanence,
the strength,
that characterizes
what is today,
totally, the ideal
rigid roof
insulation board.

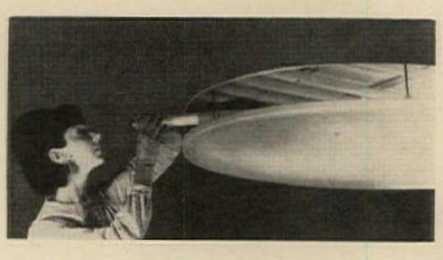
RIGID
Permalite®
ROOF INSULATION GLC

Building Products Department, Great Lakes Carbon Corporation,
333 North Michigan Avenue, Chicago, Illinois

For more data, circle 159 on Inquiry Card

Product Reports

continued from page 278



OVAL AND CIRCULAR FLUORESCENT FIXTURES

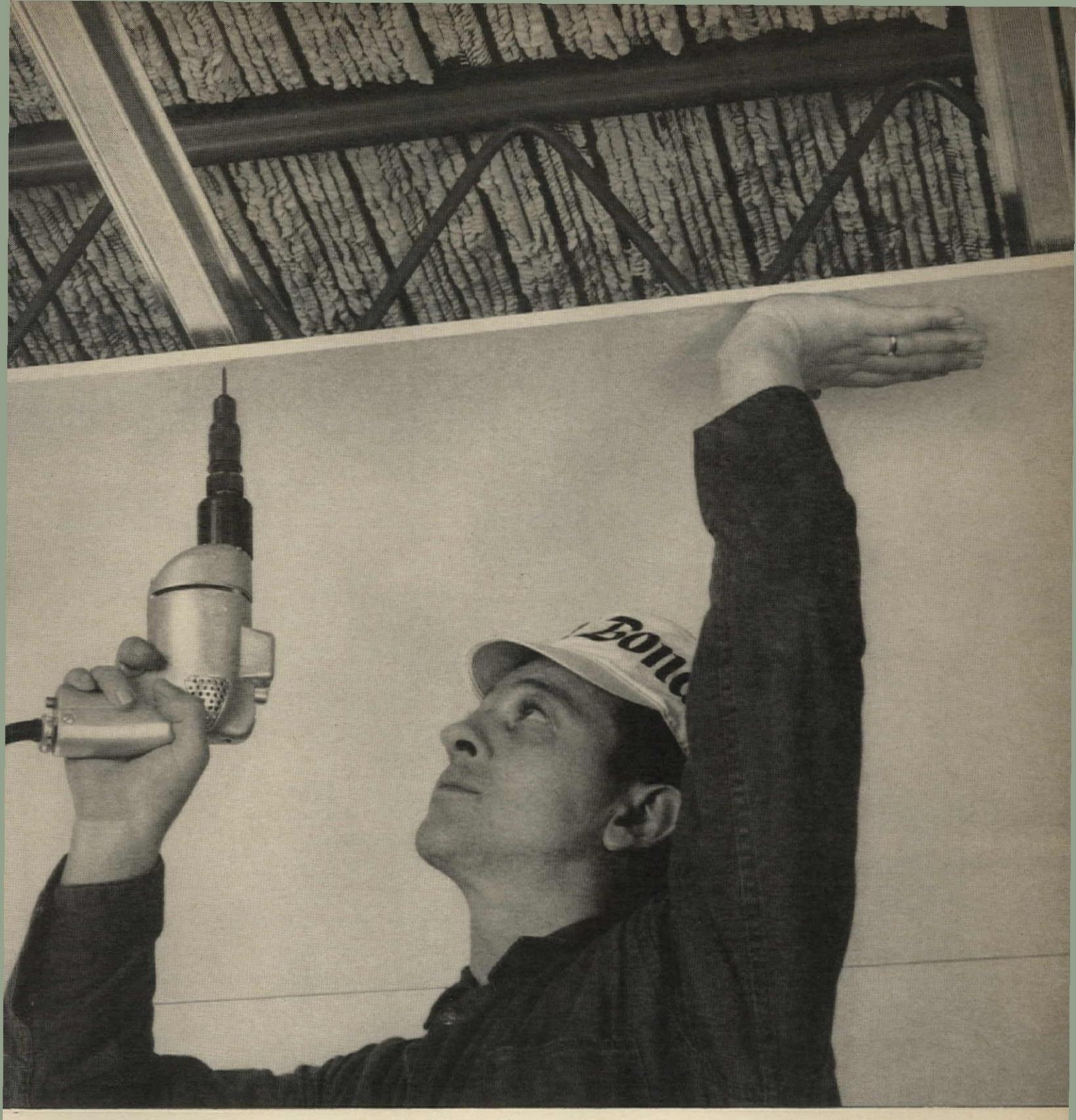
A series of rimless oval and circular shaped fluorescent lighting fixtures are being introduced for the first time in the industry under the trade name Rimless *Plex-Oval* and *Plex Orb* fixtures. *Plex-Ovals* are made of matte white *Plexiglass* with a concave surface, designed to give evenly diffused illumination without shadows and bright spots. They are available in 17 by 28 in., 23 by 38 in. and 29 by 49 in. sizes, with from two to six lamps, depending on the size of the fixture. The body of the *Plex-Oval* is a rectangular box which is installed before the ceiling is applied. The one-piece diffuser works satisfactorily with gypsum board, tile or plaster ceilings. *Plex-Orb* units are manufactured in 2-, 3- and 4-ft circles, and have the same features as the oval fixtures. *Peerless Electric Company, 576 Folsom St., San Francisco, Calif.*

CIRCLE 317 ON INQUIRY CARD

FIBER GLASS DUCTING

Glass-Flex is a flexible fiber glass duct for use in commercial, industrial and residential air-conditioning, heating and ventilating systems. Designed to meet demands for modular flexibility in a duct system, *Glass-Flex* eliminates the expense of installing new runouts when diffusers are repositioned. The duct bends to a maximum of 180 deg around obstacles without damage to its ID, or loss of efficiency, and thus eliminates the need for elbows and special fittings, or for precise measurement to complete a connection. The ducting is made of coil-wound galvanized wire covered with fiber glass and a tough exterior vinyl jacket which serves as a vapor barrier. *Glass Insulation Co., Inc., Dept G, 1795 Pasadena Ave., Los Angeles, Calif., 90031*

CIRCLE 318 ON INQUIRY CARD



New ½" Super-X Fire-Shield Gypsum Wallboard weighs less, costs less

than ⅝" standard Type X, yet has a two-hour fire rating! For floor-ceiling construction, simply attach a single layer of new Gold Bond Super-X to furring channels, using 1" Phillips head screws every 12". Super-X is available in 6' through 14' lengths, 4' wide with tapered edges. Thinking about fire-rated wallboard? Think new with Gold Bond®. Dept. AR-45, National Gypsum Company, Buffalo, N.Y. 14225.

Gold Bond®
GYPSUM WALLBOARD

One of many fine products that come from 40 years of thinking new

NGC NATIONAL GYPSUM COMPANY

For more data, circle 166 on Inquiry Card

Office Literature

continued from page 238

LIGHTING CATALOG

The company's wide range of fluorescent lighting fixtures for commercial and industrial applications is shown in a new catalog. All fixtures in the catalog are clearly identified by catalog number, and number and type of lamps that they will accommodate. For installation purposes, each fixture has a reference to its particular channel diagram and companion hangers which are also shown in the catalog. Illumination data in the form of charts is also included and individual fixtures are referenced to this, so that the reader can quickly discover how many fixtures are needed to produce a specific illumination level. *Lithonia Lighting Products Company, Conyers, Ga.*

CIRCLE 411 ON INQUIRY CARD

LONGSPAN STEEL JOISTS

Comprehensive information on the company's longspan joists are given in a new 15-page brochure. Three types of joist—underslung end, square end and hip type—in lengths from 25 to 175 ft, and depths from 18 to 88 in. are dealt with. Specifications are given as well as moment and joist load tables. The booklet includes an explanation on how the various tables are to be used. *Haven Busch Company, 3443 Chicago Drive, S. W., Grandville, Mich., 49418**

CIRCLE 412 ON INQUIRY CARD

STEAM BOILERS

Application and specification details of the company's line of electric steam boilers are given in a four-page illustrated bulletin No. 366. The boilers have a wide range of application as generators of low cost steam in institutions in which steam is needed for an independent process steam source, stand-by heating, off-season steam, humidification and steam cleaning. Designed and built to comply with ASME and National Board boiler code standards, these boilers require only city water connections and electric line service at point of installation. *Reimers Electric Appliance Co. Inc., Clearbrook, Va.*

CIRCLE 413 ON INQUIRY CARD

**Additional product information in Sweet's Architectural File*

more literature on page 302

For more data, circle 168 on Inquiry C

Another sealing challenge mastered by

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Six thousand gallons of STRUC*SURE*SEAL, in specially formulated bronze color, were used to "seal in" these intricate story-high panels of the world's largest office building . . . Pan American. Here is just one more example of the high regard architects and builders have for this proven polysulfide base sealant.

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Knowledge of this sealant's reliable performance through the years in such major constructions has vastly increased architect acceptance and preference for STRUC-*SURE*SEAL among all the polysulfides. Its wide range of colors complies fully with requirements of ASA Spec. A116.1, as tested by independent laboratories. Outstanding "gunability" makes it the contractors' choice, too.

Do you have our latest sealant data file? It contains full details on our complete line of polysulfides, butyl caulks, rubber rod stock, and wide range of sealing tapes. Write or call Presstite, 39th and Chouteau, St. Louis 10, Mo., MOhawk 4-6000.

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S *See our catalog in Sweets.*

Architect: Emery Roth & Sons
Design Consultants: Walter Gropius (The Architects Collaborative) & Pietro Belluschi
General Contractor: Diesel Construction Co., Inc.
Sealant Applicator: F. H. Sparks Co., Inc.

3 new toilets that ventilate with no moving parts

Vent-Away is now optional on the off-the-floor Glenwall* and Norwall* toilets and the de luxe, one-piece Luxor*.

*TRADEMARK AR&SS CO

themselves to get out of order

Most-wanted toilet development in years! The exclusive Vent-Away* whisks bowl odors right down the drain!

Vent-Away is a brand-new American-Standard air-siphoning device. At a touch of the button or handle, it whisks toilet odors down the drain before they can become bathroom odors. The air suction in the bowl is fast and thorough. And Vent-Away is as trouble-proof as it is effective. It is built into the toilet at the factory. There is absolutely nothing to adjust, nothing to wear out, nothing to get out of order.

In specifying toilets with Vent-Away toilet ventilator, you provide more than toilets. You provide a permanent answer to an age-old problem, at negligible added cost. Ask your American-Standard representative. Or write American-Standard, Plumbing and Heating Div., 40 W. 40th St., New York, N.Y. 10018.

AMERICAN-STANDARD

American-Standard and Standard are trademarks of American Radiator & Standard Sanitary Corporation

AMERICAN-Standard
PLUMBING AND HEATING DIVISION

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National Bank of Detroit, by architects Albert Kahn and Associates. Stainless steel vault screens, sliding doors and partitions.

ORNAMENTAL METAL WORK

Will the individuality of your design survive the metal fabricator's draftsmen, cutters, formers, welders, et al.? Yes—if you rely on Michaels. Michaels engineers and craftsmen speak the designer's language in *stainless steel, bronze,* and *aluminum.* A leader in the ornamental field for over 90 years, Michaels executes the nuances of your work and insures accuracy and structural soundness. No job is too much or little for us, from sixty-story curtain walls to a small ecclesiastical casting. Write for details and a discussion of your needs.

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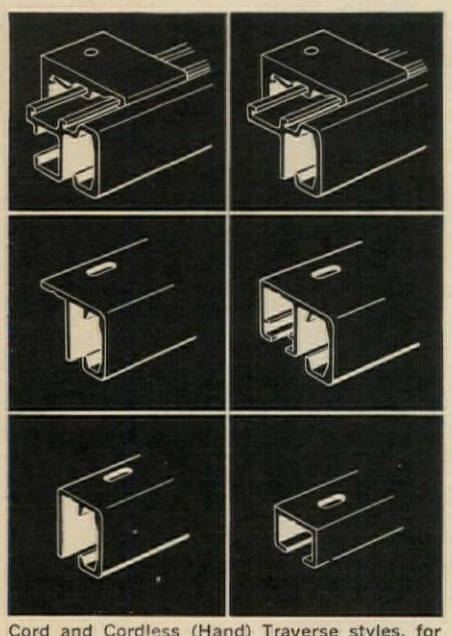
ANODIZED ALUMINUM ARCHITECTURAL TRACK

CONTRACK®



Cord and Cordless (Hand) Traverse styles, for surface or recessed ceiling mount, wall or casing mount, and hospital cubicle.

6 Performance-Engineered Styles Solve Every Commercial and Institutional Drapery Need

CONTRACK. Six cord or cordless (hand) traverse styles. Easily recessed in, or surface mounted to, concrete, plaster, acoustical tile ceilings. For wall or case mount, and hospital cubicle.

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A nationwide Graber staff is specially trained to service architects. They understand your problems and know how to help you solve them.

MAIL THIS COUPON FOR FULL INFORMATION

Send for the Graber CONTRACK KIT for architects. Includes 16 page catalog, specifications, and cost information. Request samples on your letterhead.

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Company _____

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DRAPERY FIXTURES
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. . . a Technical Jump Ahead

Rotacore models feature a front set of removable close spaced bars uniquely designed to permit four positive 5° - 15° . . . upward - downward deflections. Spring clip core retainers provide easy means of adjustment. A second set of individually adjustable spread louvers are incorporated on supply models. All models offered exclusively in extruded aluminum.

Take a Technical Jump Ahead and specify Waterloo for the best in design, construction and appearance.

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Cedar Falls, Iowa

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☐ ROTACORE GRILLES ☐ SEND COMPLETE CATALOG

☐ PLEASE HAVE REPRESENTATIVE CALL

FIRM NAME .....

CITY ..... STATE .....

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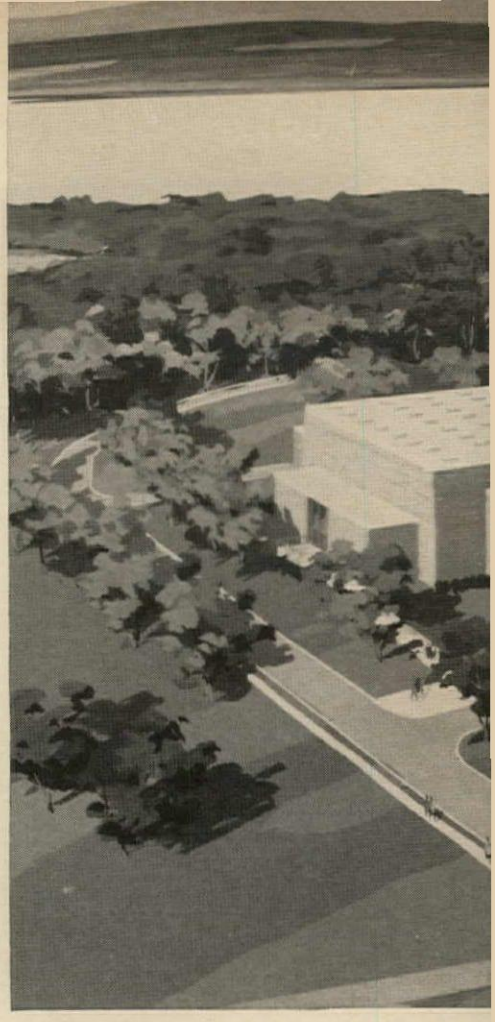
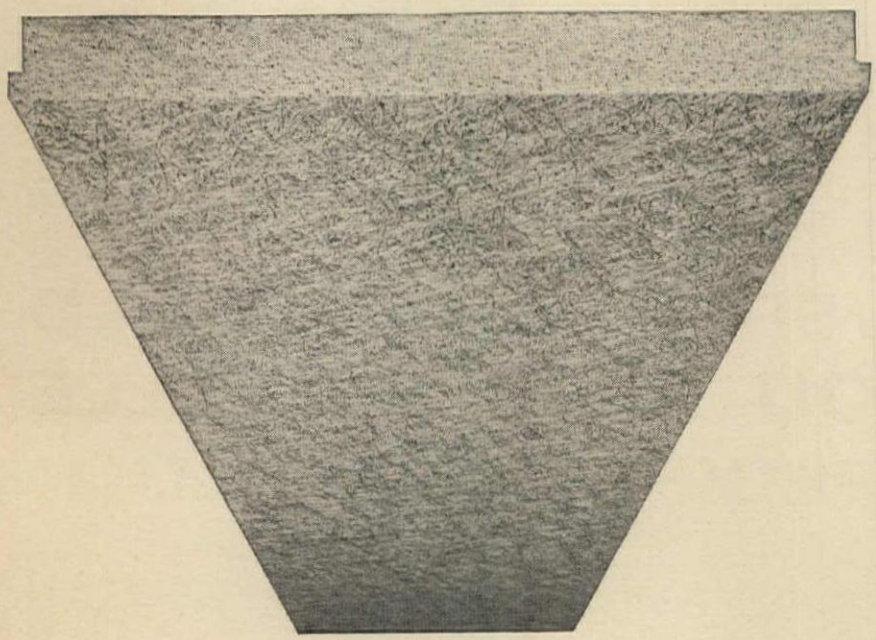
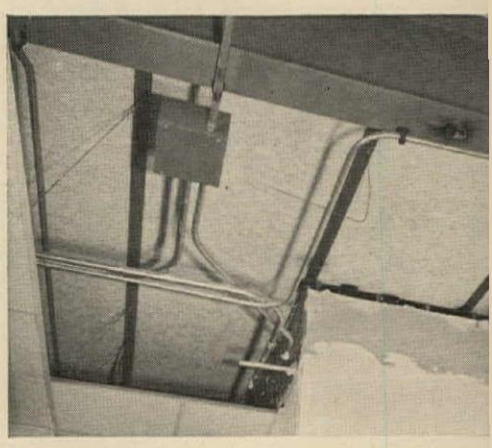
Tectum

We think new about roof deck







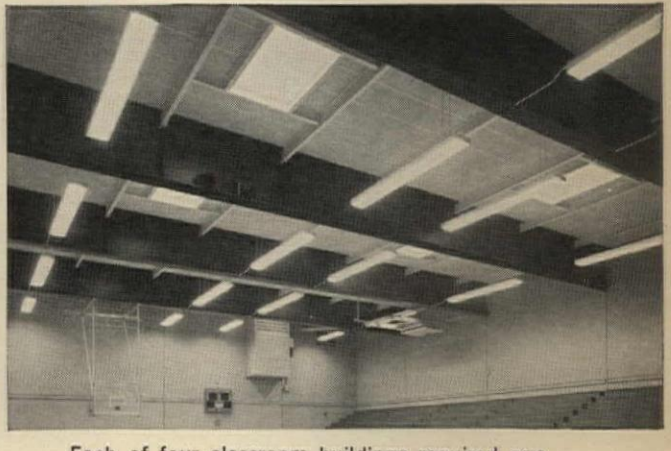
Bulb tee subpurlins support the lightweight Tectum roof deck, cut cost of structural steel.

Tectum insulates, saves structural steel, quiets noise

in U.S.'s biggest electrically heated school. Burlington High School, Burlington, Vermont, cost less than $15.30 per sq. ft. Its 3"-thick Gold Bond Tectum roof deck in 10'x 2'8" tiles have an insulation value of U-.15. Only 1½" of insulation was needed between the deck and the built-up roof to

Burlington High School is a 216,000 sq. ft., five-building complex. Architect & Engineer: Freeman-French-Freeman. General Contractor: McNamara Vermont, Inc., both of Burlington, Vt.

ctum eliminated need for additional acoustical treatment in most classroom areas. rop ceilings were needed only in corridors and on lower floors under concrete slab.



Each of four-classroom buildings required one day to lay 10,000 sq. ft. of Tectum roof deck.

insulate for electrical heating against even Vermont winters. Noise-reduction coefficient up to .90. So lightweight, yet so strong, that only minimum structural steel was needed. 60,000 sq. ft. of Tectum tile were laid for the four-story administration building in *4* days! Thinking new about getting better schools for less money? Think new with Gold Bond. Call your Gold Bond® Tectum representative, or write to National Gypsum Company, Dept. AR-45, Buffalo, New York 14225.

Gold Bond® TECTUM

One of many fine products that come from 40 years of thinking new

NGC NATIONAL GYPSUM COMPANY

For more data, circle 173 on Inquiry Card

Office Literature

continued from page 294

METAL WINDOWS BROCHURE

Aluminum, bronze and stainless steel standard windows available from Flour City are described in an illustrated brochure. Information given includes window selection guide, features of the various types of window, half-size details, dimensions and complete specifications. Types of window dealt with include double glazed, horizontally pivoted with integral venetial blind, reversible windows, and folding and casement windows. *Flour City Architectural Metals Division, 2637 27th Avenue S., Minneapolis, Minn.**

CIRCLE 414 ON INQUIRY CARD

LOAD INTERRUPTER SWITCHGEAR

Power-Zone load interrupter switchgear for the switching and protection of high voltage circuits is covered in a new bulletin, No. SD-2. The new bulletin gives detailed information on the construction of both indoor and weatherproof switchgear. Electrical safety features are illustrated and dimensional information is included. The bulletin also contains an explanation of the Square D system of "single assembly rating" for easier selection of equipment. *Square D Company, Dept SA, Lexington, Ky.*

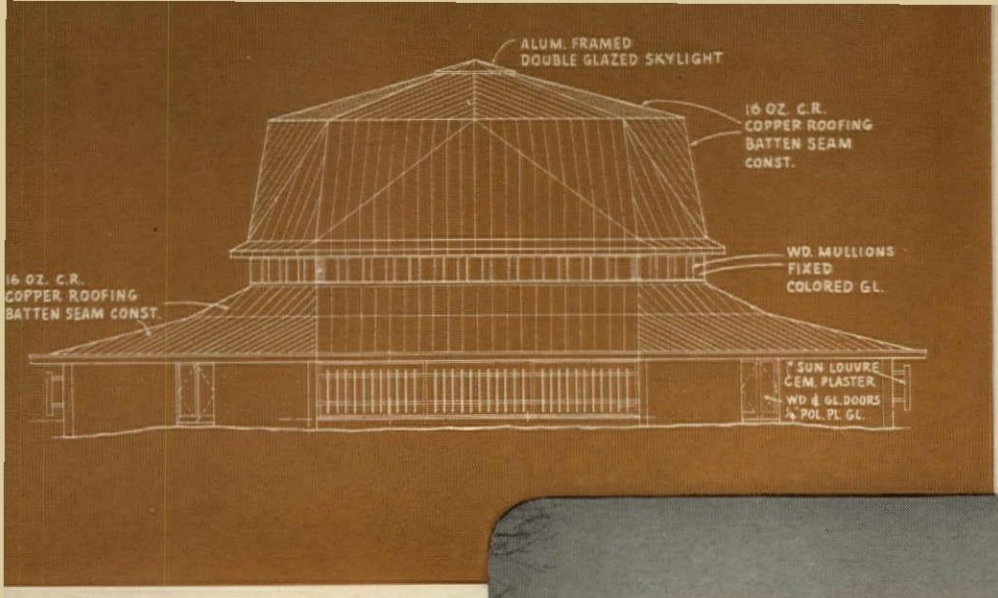
CIRCLE 415 ON INQUIRY CARD

WASHROOM ACCESSORIES

More than 150 recessed and surface mounted washroom accessories are illustrated and described in a new 16-page catalog. A variety of multipurpose units for office buildings, hotels and institutional use are featured. Some of these models combine as many as nine accessories in a single stainless steel recessed cabinet. A two-page section of the catalog is devoted to hospital accessories including grab bars, foot and hand operated dispensers for surgical soaps and detergents, and a multipurpose unit which combines six essential washroom accessories for intensive patient care. *Architectural Service Department, Bobrick Dispensers Inc., 503 Rogers Ave., Brooklyn, N.Y., 11225**

CIRCLE 416 ON INQUIRY CARD

**Additional product information in Sweet's Architectural File*



SYNAGOGUE OF THE CONGREGATION SONS OF ISRAEL, Lakewood, New Jersey. Note the imaginative use of battens to accentuate the numerous changes of roof planes of this novel octagon-on-octagon roof design. Batten seam dome and roof were constructed of 9 tons of Revere 16 oz. cold rolled copper by J. N. BEARMORE & COMPANY, INC., Sheet Metal Contractor, Asbury Park, New Jersey. Installation was made as recommended in Revere's "Copper and Common Sense." General Contractor: BRITTON CONSTRUCTION CO., Asbury Park, New Jersey. Revere Distributor: FABLE & COMPANY, INC., Philadelphia, Pa.

octagonal synagogue wears lasting

CROWN of COPPER

Synagogue of The Congregation Sons of Israel, Lakewood, New Jersey, designed by DAVIS, BRODY & ASSOCIATES AND C. J. WISNIEWSKI, Architects, New York

Here is yet another example of how the architects, by "designing with copper in mind," created the unusual without sacrificing the practical.

Copper does exactly what they wanted it to do, esthetically as well as structurally. Because of its richness, color, texture, and its maintenance-free characteristics, copper, in terms of the form of the building, was the most appropriate material to select. And, in order to emphasize the various changes of planes of the roof, the batten seam form of construction was used.

Yes, you can do so many more of the things you want to do when you "Design with versatile copper in mind."

FIRST AND FINEST IN COPPER AND BRASS—FULLY INTEGRATED IN ALUMINUM

SEND TODAY for free copy of "Copper and Common Sense," Revere's 140-Page Manual illustrating the design principles and techniques of sheet copper construction. Also free companion piece, "The Revere System of Copper Flashing," for the complete weatherproofing of masonry buildings. Address Dept. "L-2" at address below.

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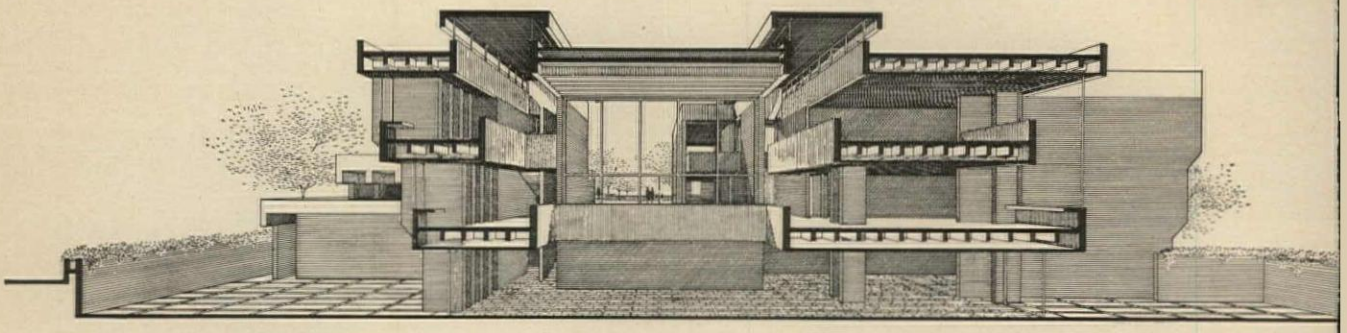
Zonolite prototype building #9: A college library



Marvin Hatami designs a college library.

Utilizing Zonolite® Masonry Fill Insulation in walls reduces initial equipment costs, saves $700 per year on fuel, substantially raises indoor wall surface temperature.

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For this investment, the client saves $700 per year on fuel. That's a direct 250% return on his yearly investment in Zonolite Masonry Fill Insulation.

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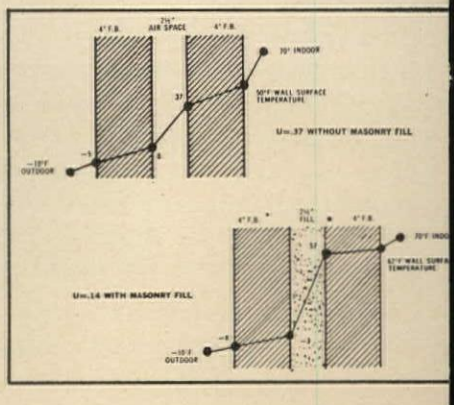

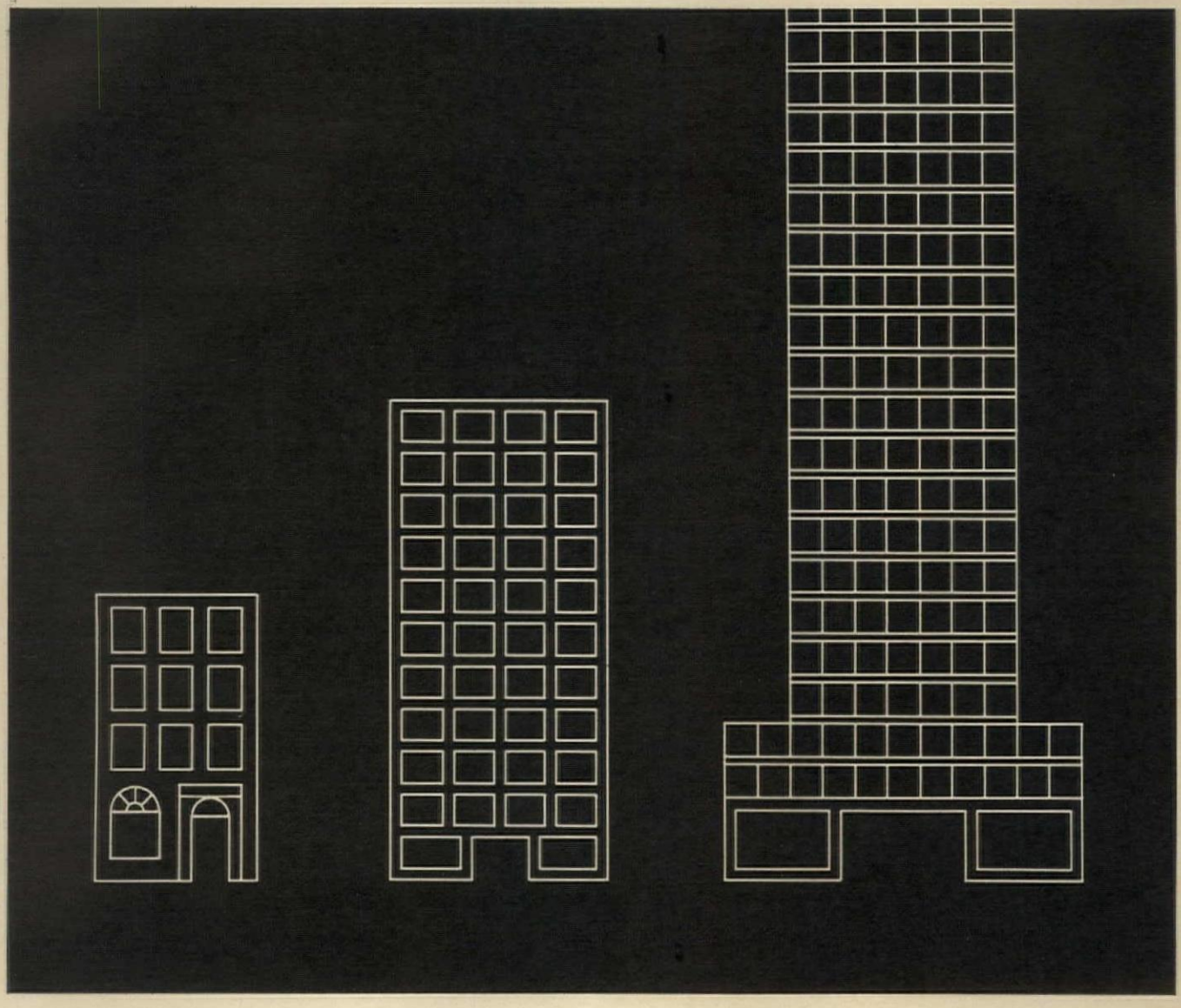

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Office Notes

continued from page 322

Kansas City, Mo. 64105.

New Addresses

John H. Alschuler Inc. Architects, Palmolive Building, 919 N. Michigan Ave., Chicago.

Abraham Waronoff, A.I.A., 10205 W. McNichols Rd., Detroit.

ARCHITECTURAL LEAGUE SETS DATE FOR EXHIBITION OF BUILDING ARTS

The Architectural League of New York has announced the 63rd National Gold Medal Exhibition of the Building Arts to be held from October 18 through November 5 in New York City.

Theme of the exhibition will be the progress made during the last three years in the interrelated arts of architecture and interior design, engineering, murals, sculpture, landscape architecture, craftsmanship and industrial design.

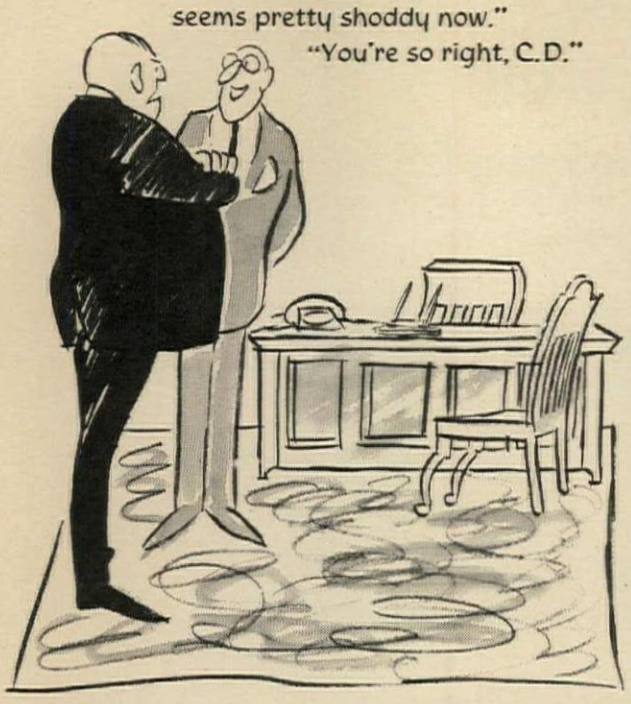
The exhibition will consist of invited exhibits and open submissions. The Committee of Selection will review open submissions and select projects for the comprehensive exhibition. Selection and exhibition of all entries will be under direction of the National Gold Medal Committee, the Committees of Selection for each classification and the Juries of Award.

The Juries of Award will award, at their discretion, Gold and Silver Medals and Honorable Mentions in the various categories. A Collaborative Medal of Honor will be given, also at the jury's discretion, to the project which best exemplifies the collaboration between architecture and the allied arts.

Awards will be announced at a reception and dinner at the Architectural League, 115 East 40th Street, New York City, on October 21.

The exhibit will be circulated throughout the country by the American Federation of Arts from November, 1965, through September, 1967.

"The time has come to redecorate our office.
All the furniture you bought
seems pretty shoddy now."
"You're so right, C.D."



"And this rug you bought has seen better days."
"You've sure had a lot of people
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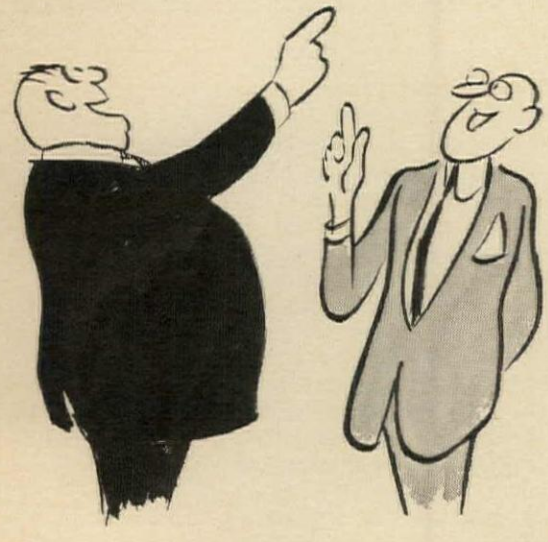

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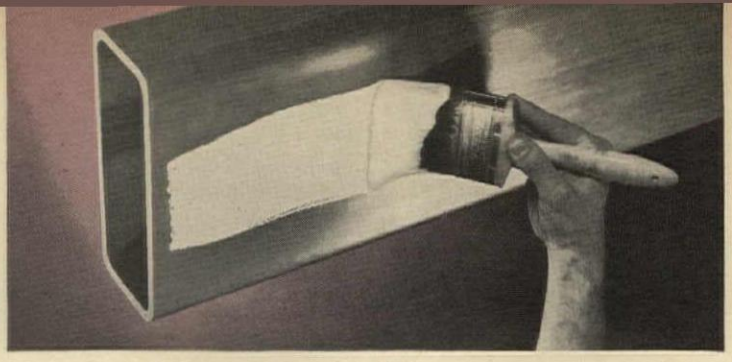

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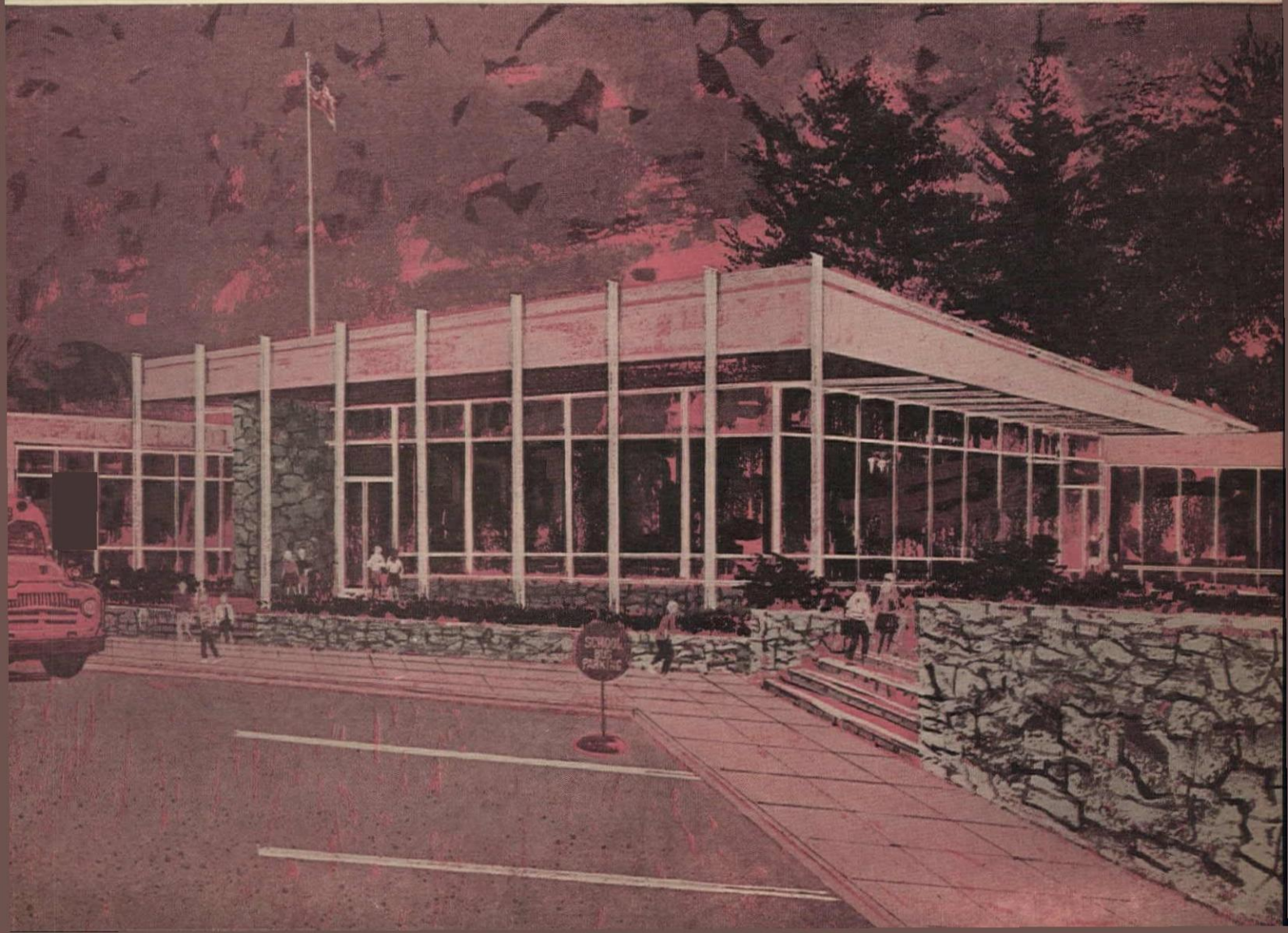


Massey Medals

continued from page 12

stages. The jury examined 424 entries and from these selected 94 finalists. From these finalists were selected the 18 medalists. The member of the original entries marked a 25 per cent increase over the 1961 competition.

The 94 finalists have been organized into a traveling exhibition which is expected to tour Canada through the end of 1966.

Members of the jury were Lawrence B. Anderson, A.I.A., chairman of the Department of Architecture at the Massachusetts Institute of Technology, chairman; Gordon S. Adamson, F.R.A.I.C., Toronto; and Douglas Shadbolt, M.R.A.I.C., director of the School of Architecture at Nova Scotia Technical College, Halifax. John A. Russell, F.R.A.I.C., dean of the Faculty of Architecture at the University of Manitoba, was chairman of the R.A.I.C. Massey Medals Committee.

The complete text of the jury report follows:

"The 18 Massey Medal Awards for 1964 are all works of very high quality, and taken as a group they show that Canadian architecture has an enormous range, not only in scale and importance, but also much diversity due to climatic and cultural differences, plus variety in formal expression as is the case with recent work in Europe and the United States.

"There are works that restate in a most expert manner a classicism of Miesian origin, such as John B. Parkin and Associates' Headquarters Building for Imperial Oil; a house in Rockcliffe by Hart Massey and LeMoyne, Edwards, Shine; and Charles Elliott Trudeau's Laboratories and Dormitories for McGill University. At the other extreme, stylistically speaking, are designs in which the architect has sought a freer and less abstracted solution to program, where at its best the interplay of form, volume, and light is intimately based on function.

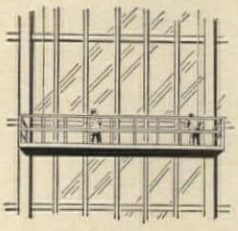
"As examples of the latter we have especially The Group Health Center of Jerome Markson, and The Central Technical School Art Center of Fairfield and DuBois. We might also include in this category two of John B. Parkin and Associates' medal winners: the Airport Control Tower at Toronto, and the Administrative Wing of the Thomas J. Lipton Plant and Offices at Bramalea.

"In still another idiom, Ian Davidson in his house on Bowen Island, and McCarter Nairne and Partners in the C. G. Brown Memorial Pool, adopt static square or rectangular forms, compose them elegantly with ancillary spaces, to produce serene and dignified environments. Both of these projects are object lessons in the expert use of ordinary materials.

"A number of churches had been earmarked for inclusion in the exhibition, some of them exemplifying considerable refinement, others more notable for their daring and flamboyance. The jury selected the Church of St. Gerard Majella by Affleck, Desbarats, Dimakopoulos, Lebensold, Sise to be a medal winner by virtue of both strength of idea and completeness in execution; it successfully exploits the nature and technology of materials

continued on page 338

HOW THEY CLEAN 8⅓ ACRES OF GLASS IN DALLAS



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monolithic reinforce
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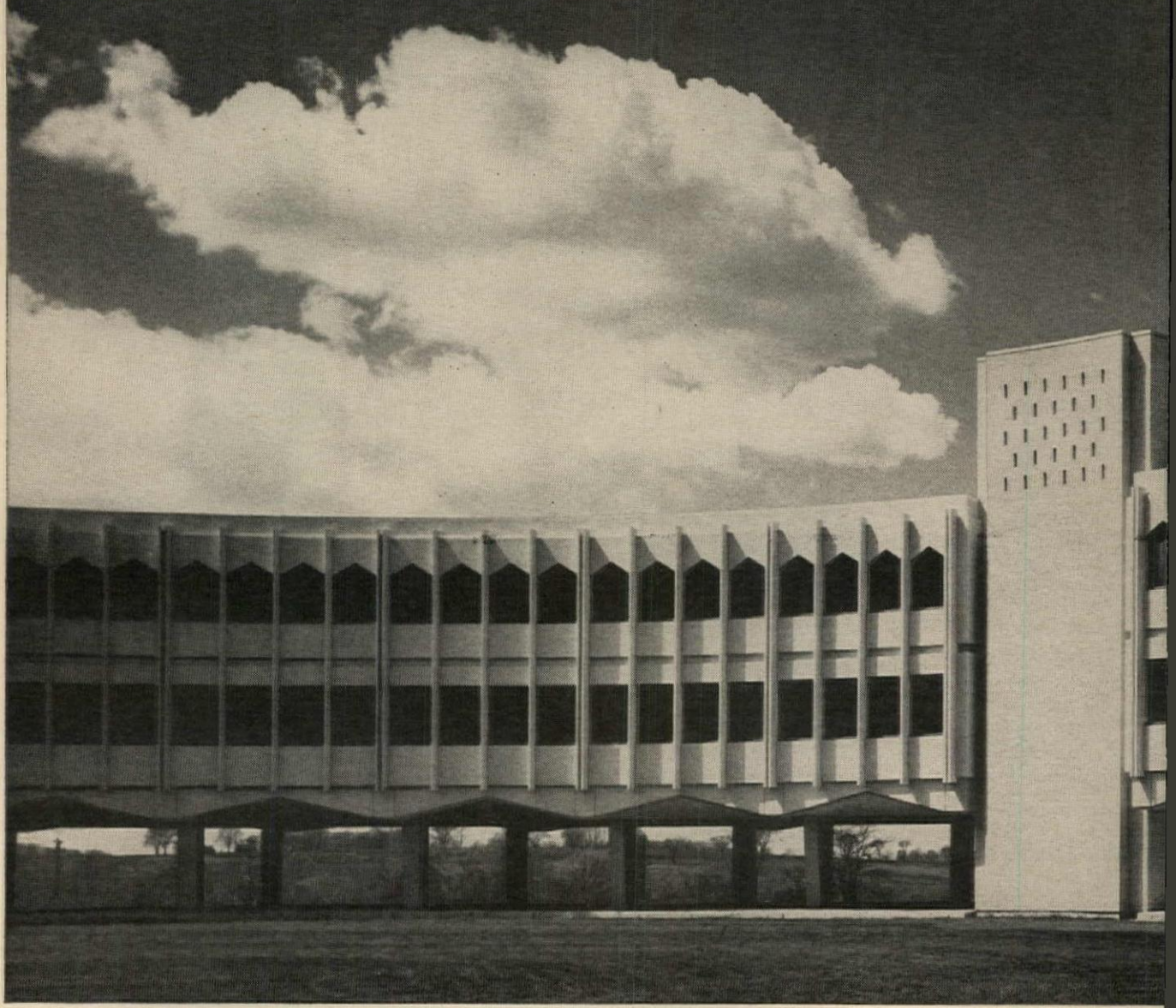

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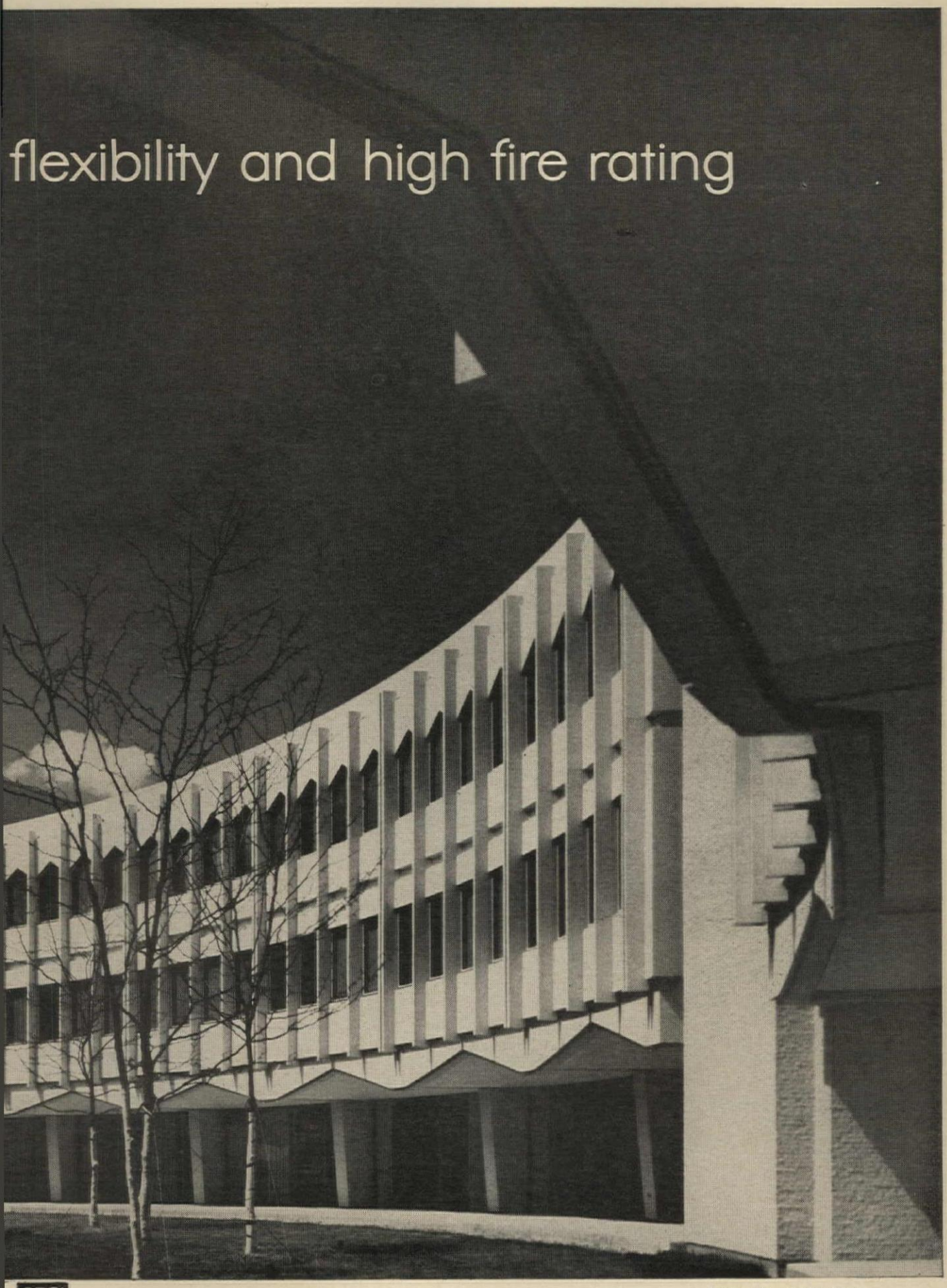


CRSI

National Offices, American Baptist Convention, Valley Forge, Pennsylvania

Architect: Vincent G. Kling, FAIA
Structural Engineers: McCormick-Taylor Associates
General Contractor: Turner Construction Company

Massey Medals

continued from page 330

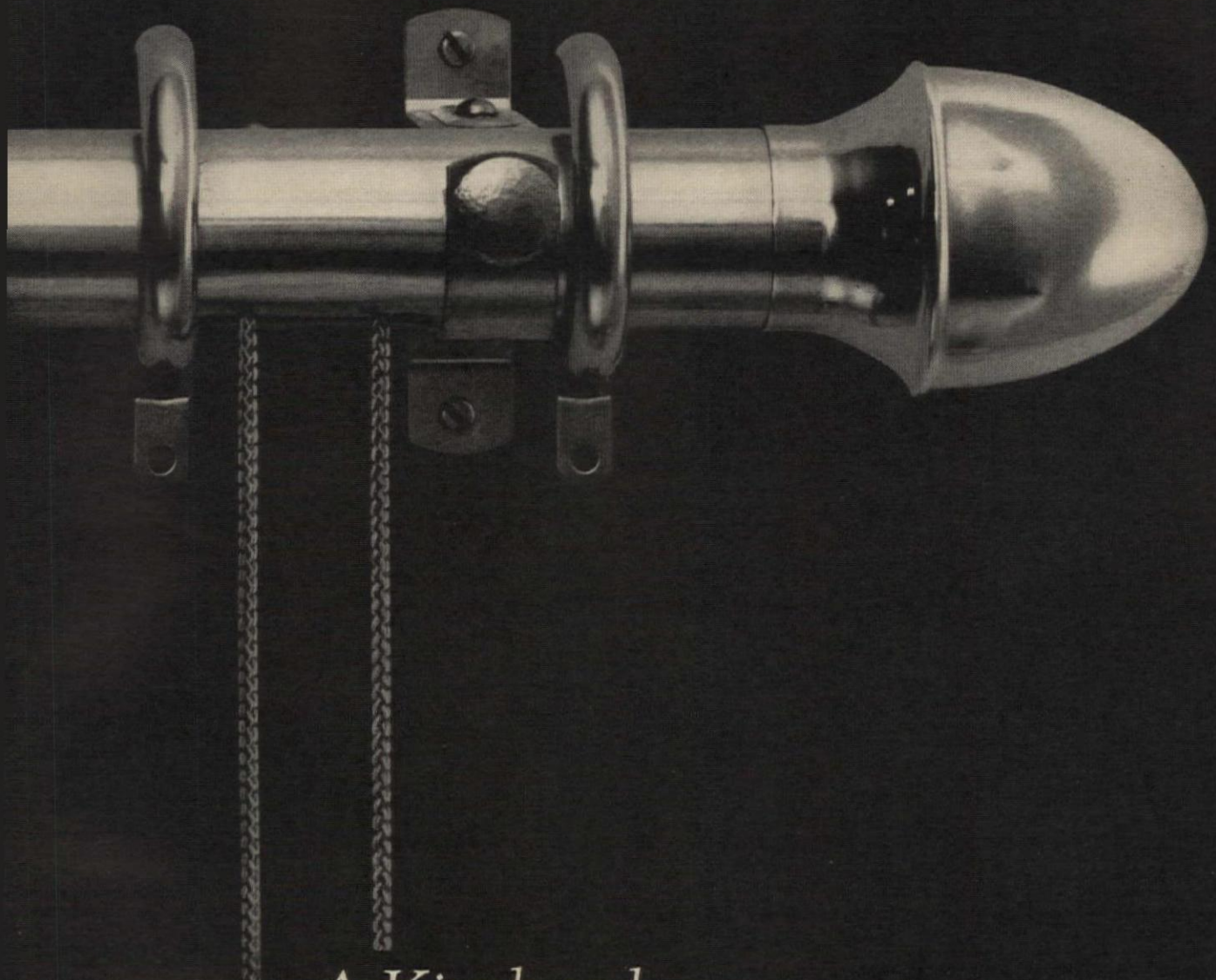
to control form and light.

"Among all of the high elementary schools that had been presented for consideration St. Paul's High School in Winnipeg, Canada, by Libling Michener and Associates, stood out as most satisfying consistent and competently treated. This represents a superior statement of what has now become a familiar prototype. On the other hand, the footbridge in Bowring Park, designed by Blanche van Ginkel in collaboration with the structural engineer, Ove Arup, is a completely unique thing. It demonstrates how a relatively minor work of civil engineering can by sensitive handling become an object as perfect and satisfying as a jewel or a hand tool. The load balances elegantly at one point; the deck between the ribs is arranged not only for the convenience of the pedestrian but so as to follow the bending moments, and its alignment is echoed by the handrail.

"Generally speaking, we were not surprised to find the outstanding institutional buildings to be in or near the large cities of the industrialized East; but the overwhelming pre-eminence of the Vancouver architects in free-standing house design is an even more conspicuous fact. The Forrest and Grinnell houses of Thompson, Berwick, Pratt and Partners, and the Maltby and Rayer houses by Fred Thornton Hollingsworth and Barry Vance Downs, illustrate this style at its best. Obviously, terrain, climate, and vegetation play a very large part in facilitating the success of these houses; yet the mastery shown in their design and construction still seems astonishing. A perfect and rare relationship seems to exist between the creative imagination of the architect and the technical skills for effective execution. To a large degree a vernacular architecture, the outstanding examples are also very original and personal.

"Two of the medal winning projects are of particular importance as milestones in the development of prototype solutions to the pressing contemporary social and economic problems of urban development. Lothian Mews by Webb Zerafa Menkes, besides being very expertly handled architecturally, has proved its high appropriateness as an intimate specialty shopping center. Jack Klein and Henry Sears' Don Valley Woods Phase 1 is the latest of a number of projects in suburban Toronto that confront the problem of high-density town house development, making of the continuous basement garage the means toward creation of a significant pedestrian street uniting the houses above ground. In this low-cost architecture, great refinement of detail may be impossible, and consequently the ability to think through a clear general concept becomes all the more essential.

"The jury has found that all of the entries were of a quality that made studying them a rewarding experience and feel they have been able to premiate a group of projects each of which shows a high level of professional, artistic and technical competence, and the ability to follow through a consistent development of good basic ideas to competent realization in detail."



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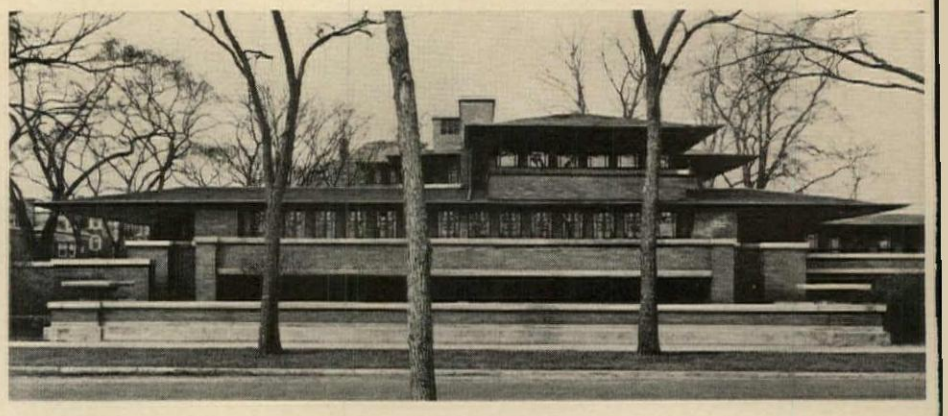
ROBIE HOUSE STILL THREATENED BY LACK OF CONTRIBUTIONS

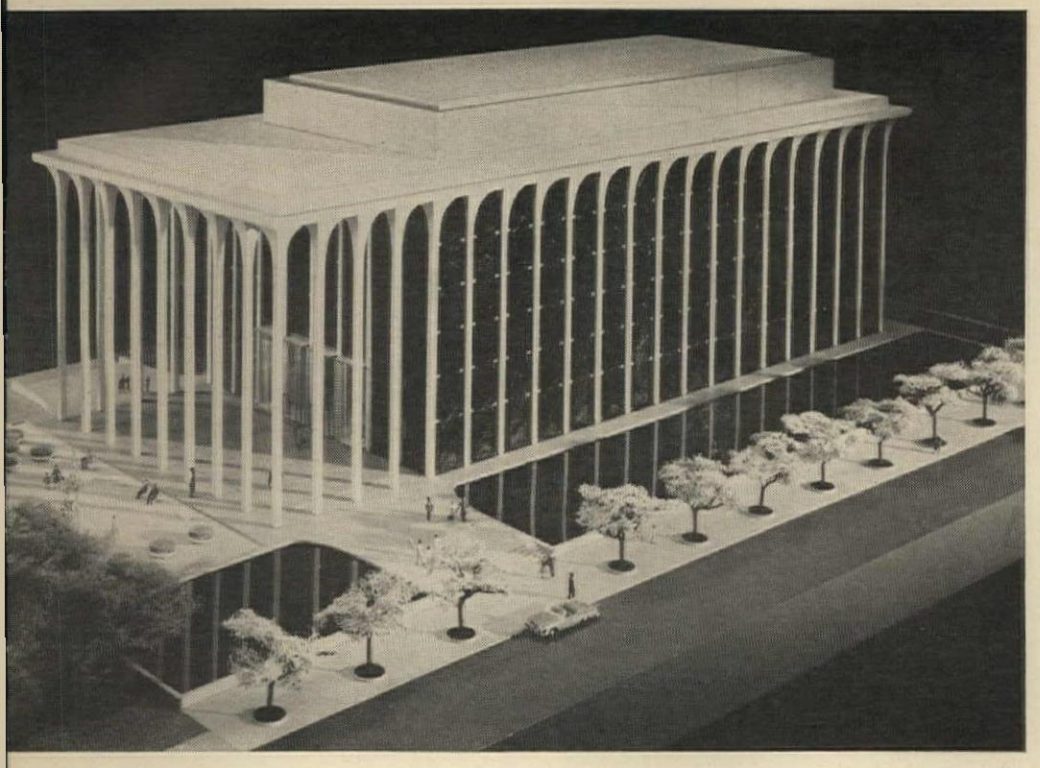


"Like all precious treasures, the Robie House is mortal," said Ira J. Bach, chairman of the Committee for Preservation of the Robie House, in a recent speech before the Rochester, New York, Society of Architects. For two years an international committee of more than 100 architects, historians, critics and educators has been trying to raise the $250,000 estimated as necessary to restore Frank Lloyd Wright's all-too-mortal monument. At present, only $55,000 has been received, just a little more than one fifth of what is needed.

Mr. Bach felt an intensive effort must be made to raise the balance. He registered a plea: "I know most of the architects in the United States believe in the Robie House and want to help in its restoration. There are about 27,000 registered architects in the United States. I am quite sure that most of them believe in what we are doing. I suspect however, that most of them do not know the straits we are in. If 25,000 registered architects donated five dollars each, that would amount to $125,000—and we would be well near the end of our goal.

"I do not want to leave you with the thought that the profession has been remiss. Our largest single group of supporters has been the architects. I do think the impression may be abroad that the restoration of the Robie House is no longer at stake: the cause has been in the public eye for a long time."

Mr. Bach hopes that those interested citizens wishing to help will send contributions to the committee in care of Commissioner Ira J. Bach, room 1006 City Hall, Chicago, Illinois 60602. Checks should be made payable to "Robie House Restoration Fund, University of Chicago". Donations are deductible for federal income tax purposes.



THE 63-FOOT SPAN REQUIRED BY A DEEP COLUMN-FREE PORTICO was achieved here without affecting the striking appearance of structural lightness by the use of post-tensioned concrete. Six interior beams spanning the portico at roof level each contain four 30-wire Ryerson BBRV tendons. Stressing of exterior beams is accomplished with two 40-wire units.

Office Building for Northwestern National Life Insurance Co., Minneapolis, Minnesota; Architects and Engineers: Minoru Yamasaki and Associates; **Structural Engineers:** Worthington, Skilling, Helle & Jackson; **Contractor:** George A. Fuller Company.

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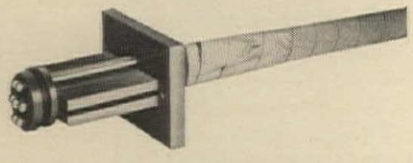
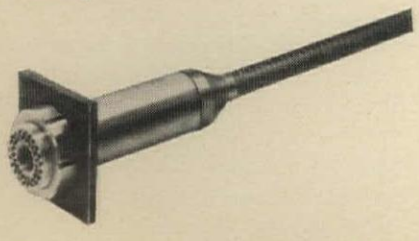
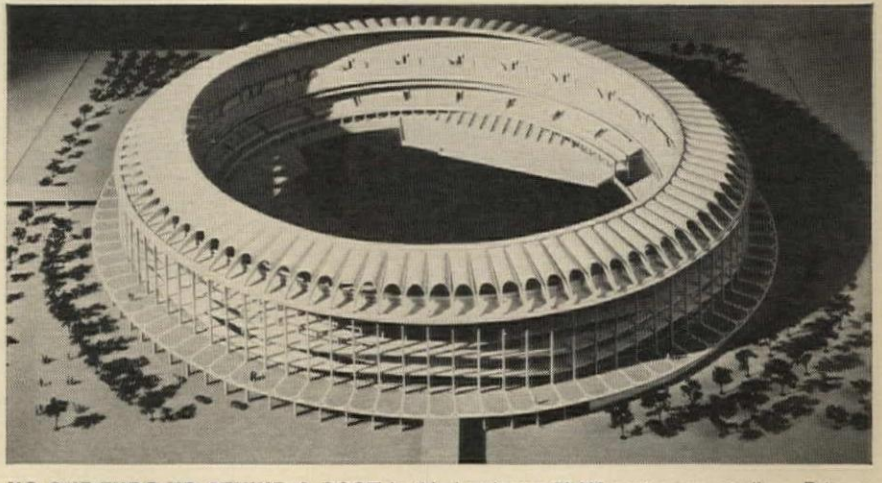


Typical movable end anchor of Ryerson BBRV *unbonded* (greased and wrapped) tendon after stressing.



Typical movable end anchor of Ryerson BBRV *bonded* (grout type) tendon after stressing.



NO ONE ENDS UP BEHIND A POST in this handsome 50,000-seat sports stadium. Extreme cantilevers, made possible by Ryerson BBRV post-tensioning of the concrete girders, will keep columns back out of sight lines. The outer edge of the oval roof canopy extends 50′ over the upper seating deck. And the upper deck, in turn, cantilevers 40′ over the lower deck. Roof and deck each have 96 beam lines and the girders, 75′ and 67′ long respectively, are each post-tensioned by 6 tendons of 42 or 43 wires.

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"President Johnson"

continued from page 20

squares, malls and playgrounds. Also President Johnson recommended special grants to cities for landscaping, the improvement of city parks and other measures to bring beauty and nature to the city dweller.

"But beauty is not simply a matter of trees and parks," said the President. "The attractiveness of our cities depends upon the design and architecture of buildings and blocks and entire neighborhoods. I intend to take further steps to ensure that federal construction does not contribute to drab and ugly architecture. . . ."

National Foundation on the Arts

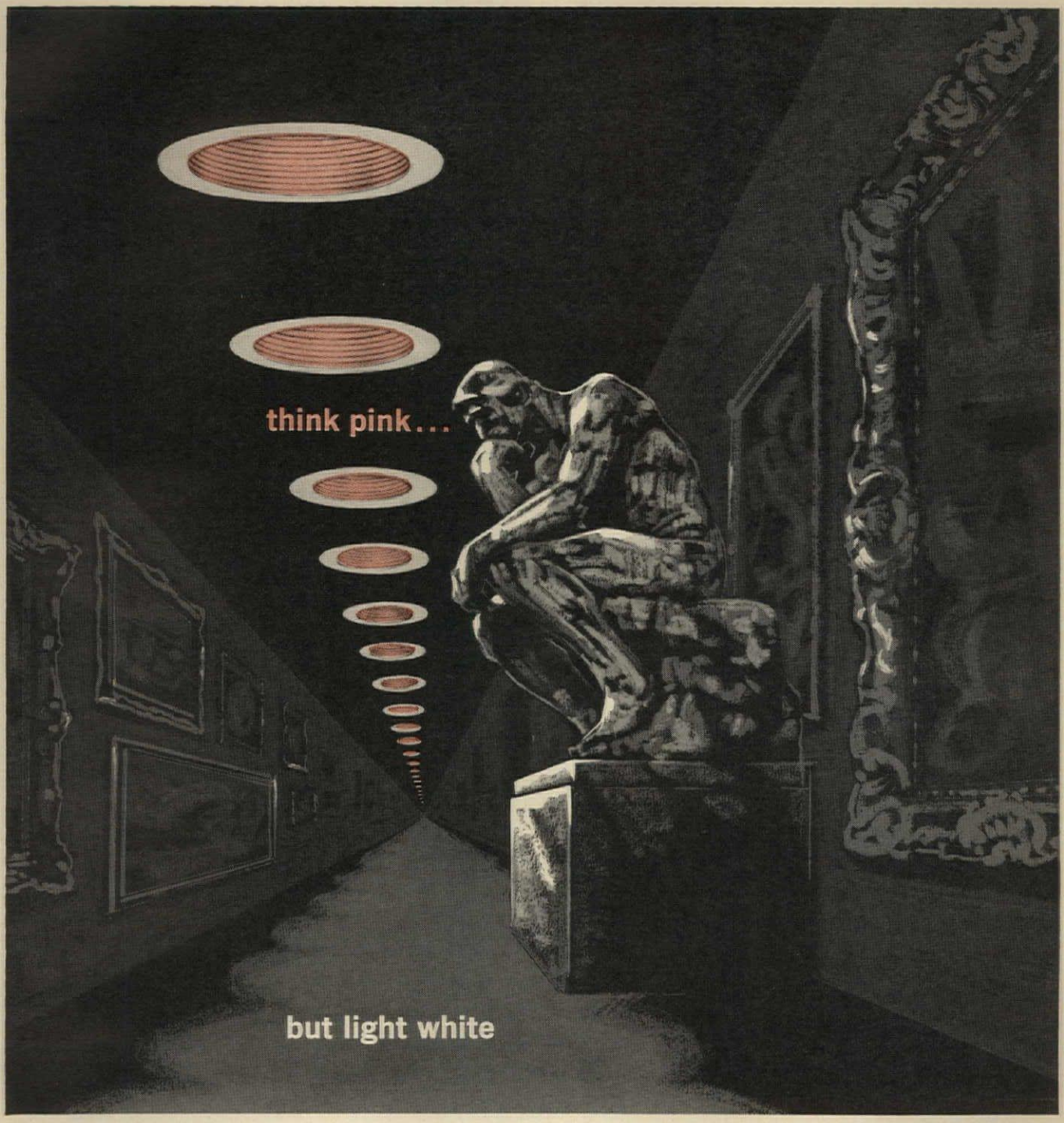
On March 10, President Johnson submitted to Congress a bill which would establish a National Foundation on the Arts and the Humanities. The foundation would be composed of three branches: a National Endowment for the Arts; a National Endowment for the Humanities; and a Federal Council on the Arts and the Humanities. The foundation would have an appropriation of $10 million for the 1966 fiscal year, and necessary funds for succeeding years, to be divided equally between the National Endowment for the Arts and the National Endowment for the Humanities. Also, each of the National Endowments would receive up to five million dollars in each fiscal year to match private contributions.

Primarily of interest to architects is the National Endowment for the Arts, under whose jurisdiction would come architecture and allied fields. Incorporated into this Endowment would be the National Council on the Arts, named by President Johnson on February 23. The chairman of the Endowment, who would be named by the President with the advice and consent of the Senate, would assume the duties of the chairman of the National Council on the Arts.

The National Endowment for the Arts would be authorized to give grants-in-aid to those engaged or concerned with the creative and performing arts. The types of projects eligible for this aid would be: "(1) productions which have substantial artistic and cultural significance, giving emphasis to American creativity; (2) productions irrespective of origin which are of significant merit and which, without such assistance, would otherwise be unavailable to our citizens in many areas of the country; (3) projects that will encourage and assist artists; (4) projects that will encourage and develop the appreciation and enjoyment of the arts by our citizens; and (5) other relevant projects, including surveys and planning in the arts."

The Federal Council on the Arts and the Humanities would serve to coordinate and advise the two Endowments and coordinate the activities of the Foundation with other agencies. The Federal Council would have seven members: the chairmen of the two Endowments, the United States Commissioner of Education; the secretary of the Smithsonian Institution; the director of the National Science Foundation; the Librarian of Congress; and a member designated by the Secretary of State.

continued on page 350



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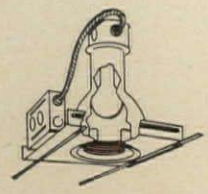

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"President Johnson"

continued from page 346

In presenting the bill President Johnson stated that "pursuit of artistic achievement, and making the fruits of that achievement available to all its people, is . . . among the hallmarks of a Great Society."

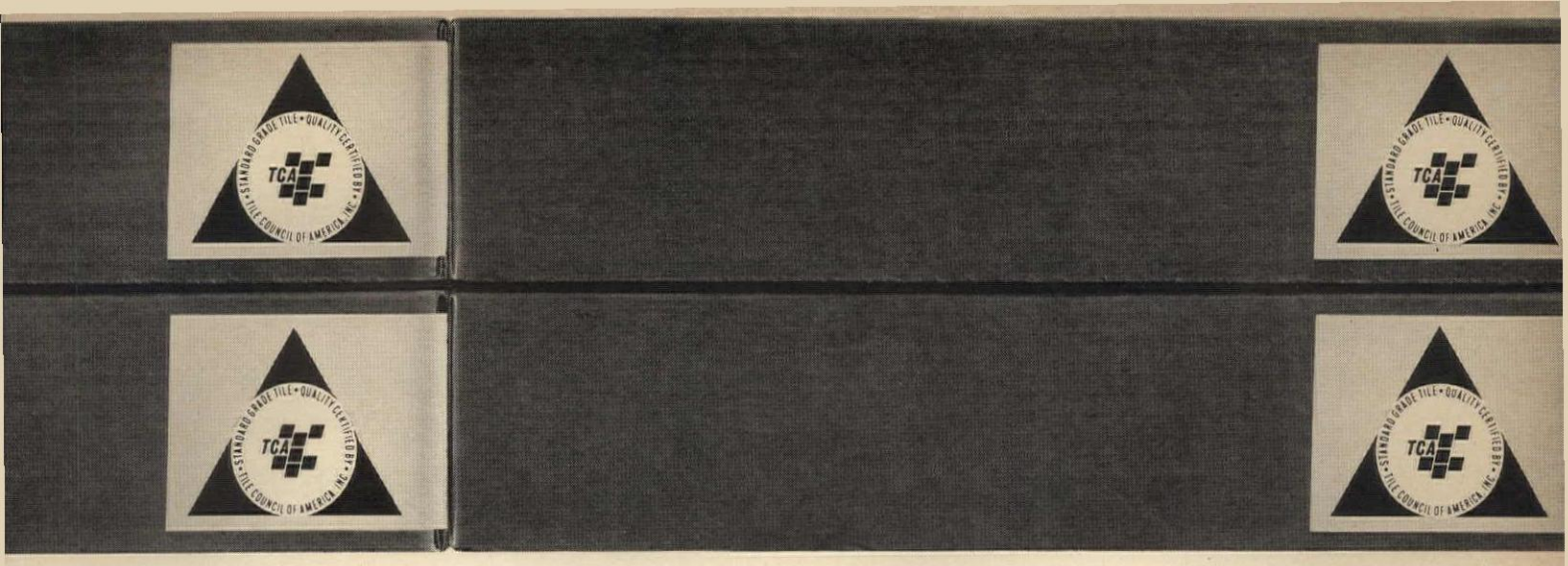
National Council on the Arts

On February 23, President Johnson named 24 members and a chairman to serve on the National Council on the Arts. Chairman of the council is Roger L. Stevens, special assistant to the President on the arts. Members are designated for terms ending in the indicated years.

1970—Albert Bush-Brown, head, Rhode Island School of Design, Providence, Rhode Island; Paul H. Engle, poet, writer, teacher, Cedar Rapids, Iowa; Ralph Philip Hanes, president, Community Arts Council, Winston Salem, North Carolina. Also Rene d'Harnoncourt, director, Museum of Modern Art, New York City; Oliver Smith, scenic designer, producer, painter, New York City; Isaac Stern, musician, New York City; George Stevens Sr., film director, Los Angeles, California; and Minoru Yamasaki, architect, Birmingham, Mich.

1968—Leonard Bernstein, composer, conductor, teacher, New York City; Anthony A. Bliss, president, Metropolitan Opera, New York City; David Brinkley, NBC News, Washington, D.C.; Warner Lawson, musician, educator, Washington, D.C. Also, William Pereira, architect, teacher, Los Angeles, California; Richard Rodgers, composer, producer, writer, Southport, Connecticut; David Smith, sculptor, Bolton Landing, New York; and James Johnson Sweeney, writer, museum director; Houston, Texas.

1966—Elizabeth Ashley, actress, Los Angeles, California; Agnes de-Mille, choreographer, New York City; Ralph Waldo Ellison, writer, lecturer, teacher, New York City; Father Gilbert Hartke, clergyman, theatrical educator, director, District of Columbia. Also, Eleanor Lambert, fashion designer, head: Council Fashion Designers, New York City; Gregory Peck, actor, Los Angeles, California; Otto Wittman, museum director, Toledo, Ohio; and Stanley Young, author, publisher, Executive Director ANTA, New York City.



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BRIGHT OUTLOOK FOR BUSINESS IN LBJ'S FIRST TERM

A recent analysis by the McGraw-Hill Department of Economics predicts a bright business outlook for the first term of President Johnson's administration "even if the administration achieves only a modicum of success."

The President has set a goal of a higher average standard of living for the entire nation under the Great Society, and by 1968 more people will be able to spend more money for goods and services, says the report.

Among the factors that the report lists as contributing to economic growth are: tax reduction, population growth and family formation, distribution of income, and larger expenditures for research and development. All of these factors, the report points out, will result in larger capital investment.

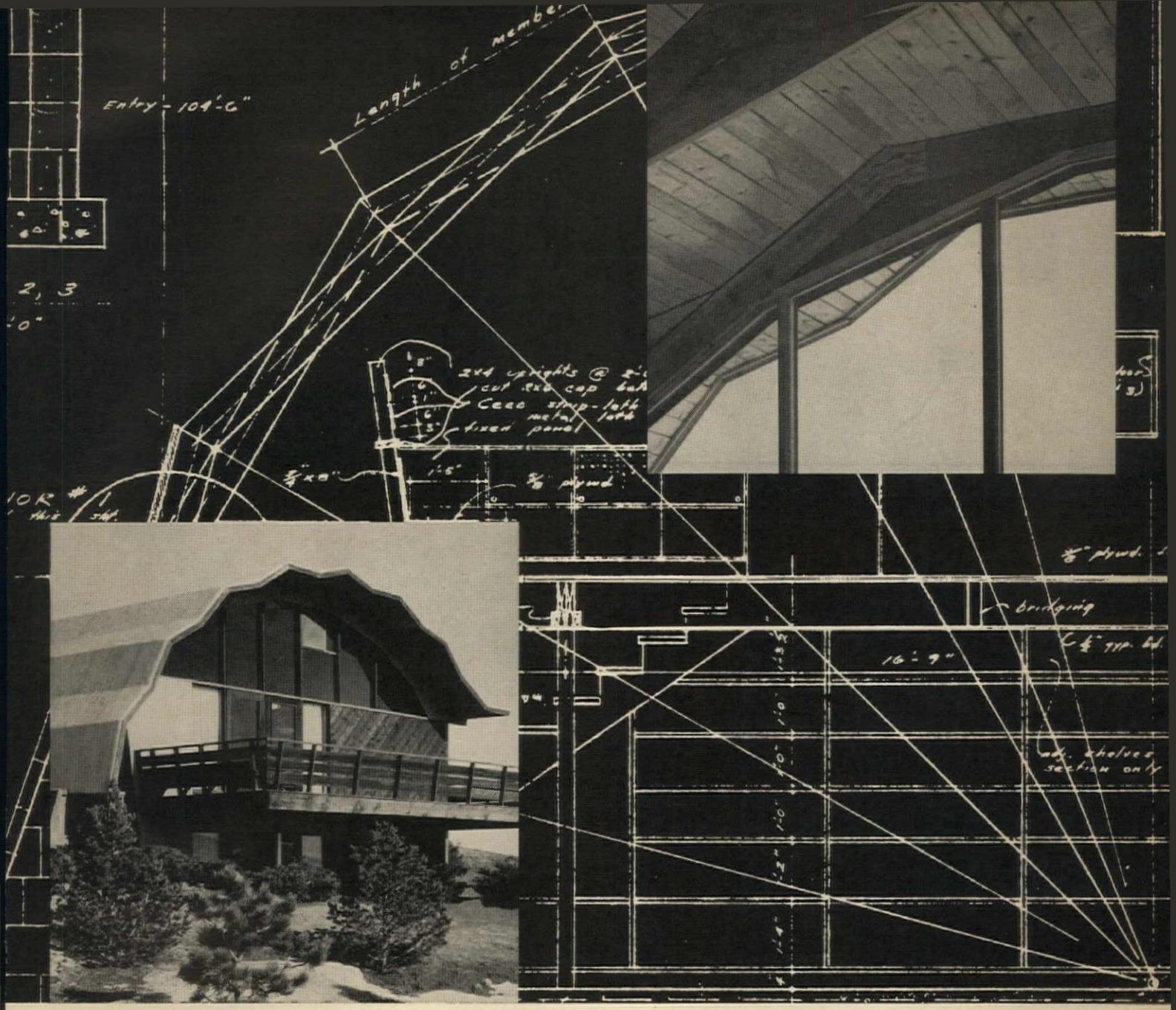
By 1968, the six per cent gain in population since 1964 will be most evident in the age groups under 25 years old, according to the report, and schools and colleges will therefore have to expand greatly in the next four years to accommodate it.

The report predicts an increase in the rate of family formation as well as a 20 per cent increase in the amount of money the average family will have to spend. The trend toward income equality will continue in the next four years, it states, as will the trend toward more leisure time.

Altogether, "the basic forecasts of population and family increases along with rising and re-distributed incomes point to an expanding consumer market and a steady upgrading of purchases within the market. Thus, consumer expenditures for goods, services and new housing are expected to rise at a faster pace than the U.S. economy as a whole."

Expenditures for research and development are also expected to be greater in the next four years, as American companies, pressured by foreign competition, modernize their facilities.

Finally, the report anticipates that the government will increase its spending on the state and local level, and "will be exerting a greater influence for national economic growth in the four years ahead."



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Structural Engineer: Perry C. Tyree

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WORLD SOCIETY FOR THE STUDY OF HUMAN SETTLEMENTS

The World Society for Ekistics, a new association, whose object is to plan a better society for people all over the world, was formally established in London on February 5, when a group of founder members agreed on a constitution and formulated in general terms the main aims and objects of the new Society.

Broadly, these are to promote the interdisciplinary and international study of human settlements throughout the world, in an attempt to mobilize the vast resources and immense technological powers now available, towards the creation of a better life for man in an urban environment.

The formation of this society is a direct result of two symposiums held in Delos in the summers of 1963 and 1964, when a number of men and women from many disciplines and many parts of the world gathered to discuss the problems of man in the context of human settlements, amid today's bewildering technological and social revolution.

Realizing that the present population explosion indicates an increase in the urban population at the rate of 4 per cent per year, and believing that inadequate and mistaken projections of urban development were leading to chaos and inexcusable waste, the symposium felt that the need for "rational and dynamic planning of human settlements both now and in the forseeable future" was of the utmost urgency. It was further felt that studies must be begun immediately, at a level and intensity never before envisaged, that they must recognize the extent to which technological changes affect man's social behavior, and in planning cities of the future, "must allow for the active participation of the individual in framing his own environment, so that he can use creatively the vast potential of advancing technology," which is threatening to engulf him.

At this first symposium, the members signed "the Declaration of Delos" in which they pledged themselves to a wholehearted effort to

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World Society

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tackle the problem on a world wide scale: "We believe that the problem of human settlements is a general and fundamental problem in our new, dynamic world and that it must be viewed and studied in such a way that it will, in common with all great scientific disciplines, transcend our local differences. We agree that the practical implementation of policy in such vital fields as land use, the location of investment or the planning of cities over time will be determined by domestic policies and needs; and as citizens, we pledge ourselves to attempt to bring these issues into the active political dialogues of our local societies. But we are not divided in what we wish most strongly to affirm —that we are citizens of a worldwide city threatened by its own torrential expansion and that at this level our concern and commitment is for man himself."

The second Delos conference was devoted to a discussion of practical ways of putting these aims into effect. Among the recommendations made were: the establishment of centers of study of ekistics in appropriate universities and institutions around the world; the recognition of human settlements as a separate sector of activity within the framework of the United Nations and the allocation of special funds to this field; the formation of a world association of individuals concerned with the problem of human settlements to promote interest in the field.

The instigation of the Delos symposiums, which are now to become an annual event, and the subsequent formation of the World Society for Ekistics, were mainly due to the inspiration of Dr. Konstantin Doxiadis, the Greek architect and planner, whose dedication to ekistics has long been apparent. Other founder members of the new Association are: P. Psomopoulos of Greece—architect; A.B.K. Brohi, Pakistan—lawyer; Professor Jean Gottman, France—geographer; Professor Sir Robert Matthew and Lord Llewelyn-Davies, Britain—architects; Dr. Waldemar Nielsen, U.S.A.—economist; Professor Richard Buckminster Fuller, U.S.A.—designer and engineer; Professor Jose-Ramon Lasuen Sancho, Spain—economist.

Memorial Library, University of Notre Dame, Notre Dame, Indiana. Architects: Ellerbe Architects, St. Paul, Minnesota

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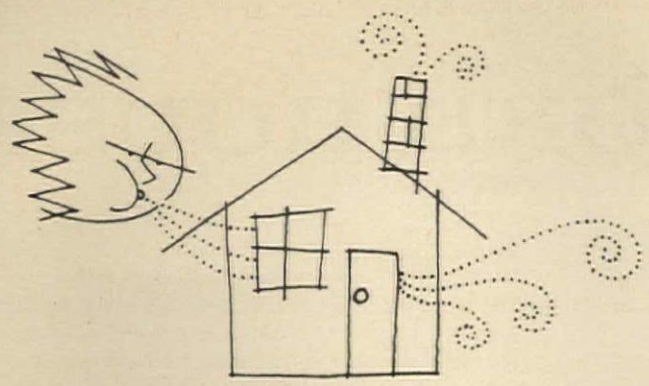

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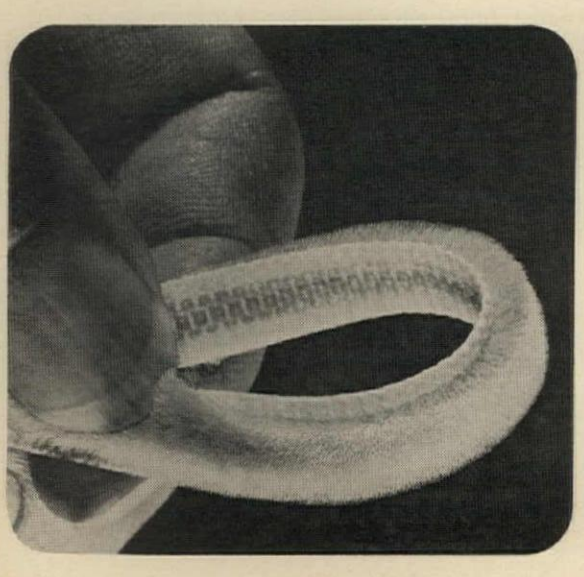

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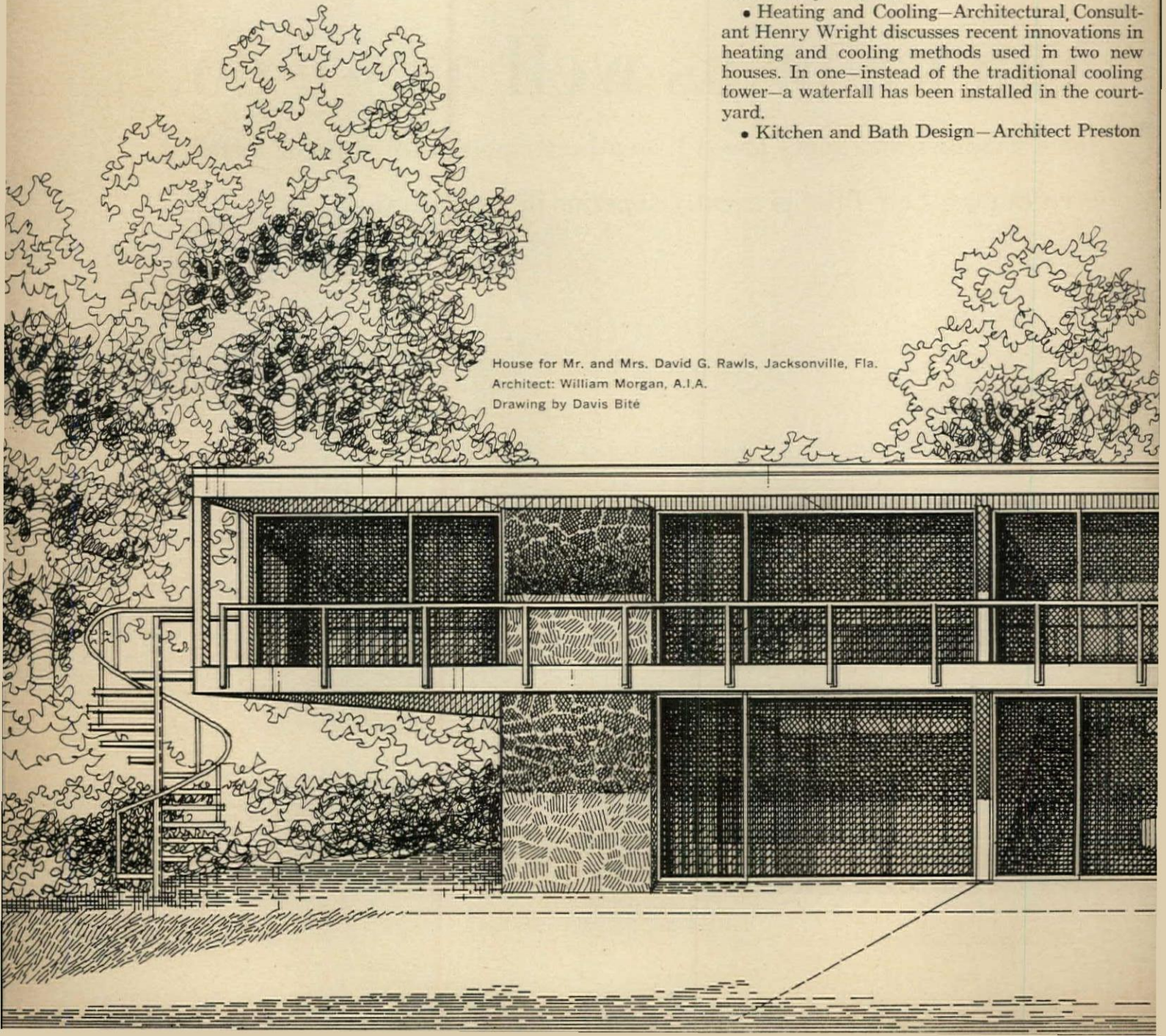
In addition, Record Houses of 1965 will present these timely features:

- Heating and Cooling—Architectural Consultant Henry Wright discusses recent innovations in heating and cooling methods used in two new houses. In one—instead of the traditional cooling tower—a waterfall has been installed in the courtyard.
- Kitchen and Bath Design—Architect Preston



House for Mr. and Mrs. David G. Rawls, Jacksonville, Fla.
Architect: William Morgan, A.I.A.
Drawing by Davis Bité

OF 1965

Bolton writes about new architectural approaches to kitchen design.

• Comparative Cost Calculator—Handy guide to estimating the cost of building Record houses in other key localities.

• Progress in Products — Editorial roundup of quality residential products.

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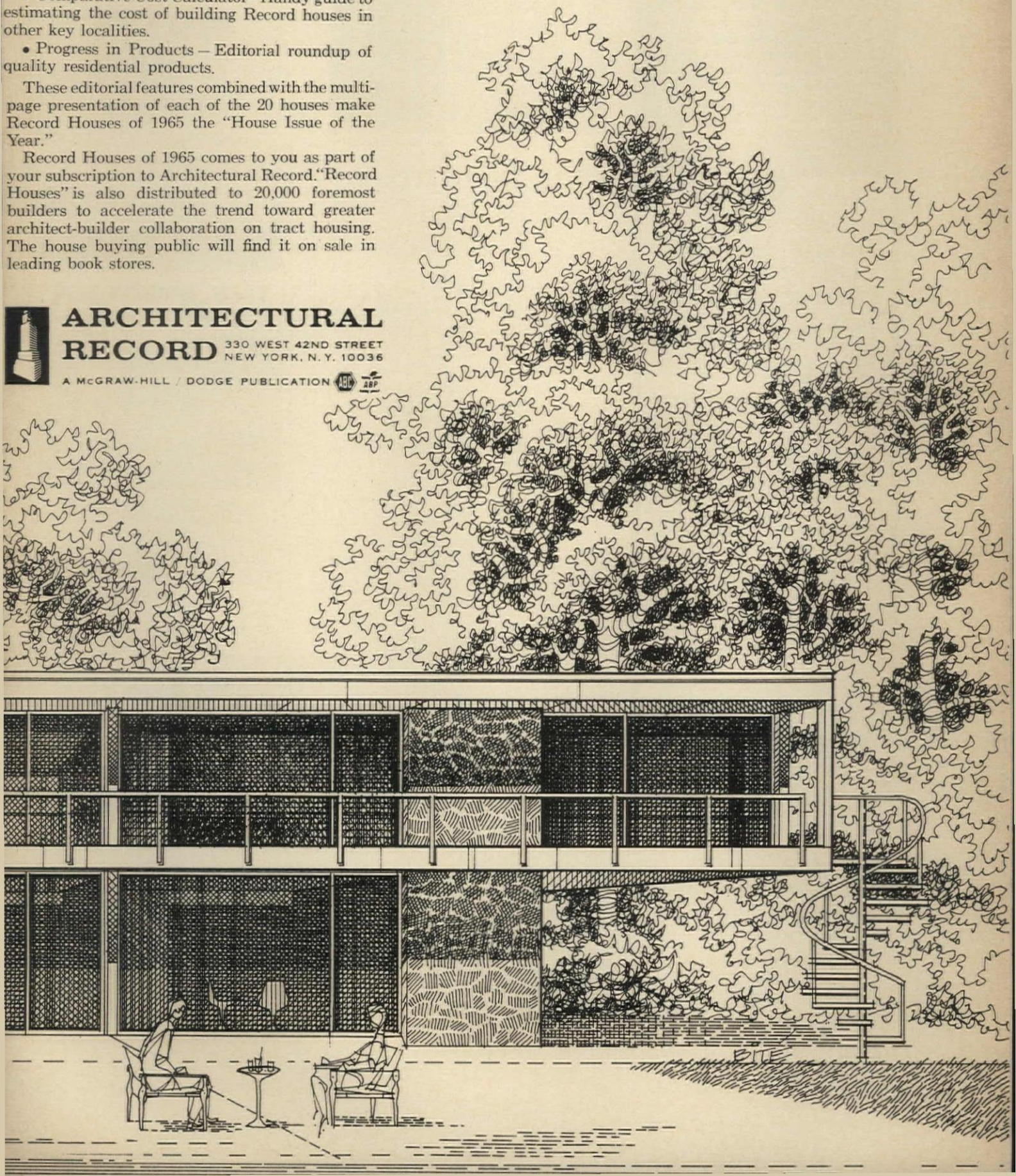

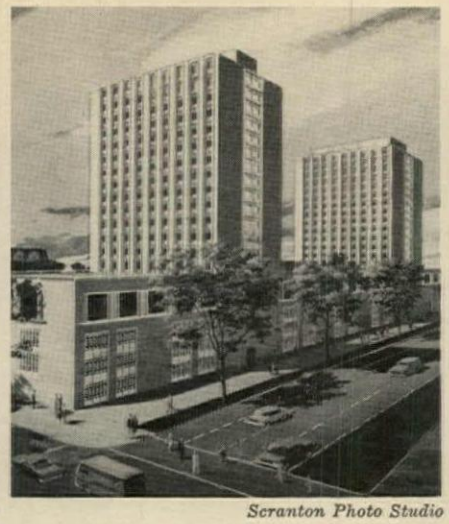

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TWIN DORMITORY TOWERS WILL RISE IN BOSTON

Construction has started on twin 19-story dormitory accommodations for 1,098 students at Boston University. The $8 million building was designed by the architectural firm of Von Storch and Burkavage. General contractor is the Paul Tishman Company, Inc.

The building has a structural steel skeleton with an exterior of brick, precast masonry and aluminum window frames.

Twin 14-story residence halls will rise above a broad base which will house four floors of garage area and an intermediate floor that will contain dining, lounge and recreation facilities.

The residence halls will contain 110 single bedroom units and 494 double bedrooms. Completion of the project is scheduled for June, 1966.

ISRAELI NAMED TO CINCINNATI STAFF

Werner Y. Wolff, Israeli architect, has been appointed assistant professor of architecture in the University of Cincinnati's College of Design, Architecture, and Art.

Professor Wolff worked as an architect-planner in 1960 for the London County Council, England. In 1961-62 he was chief urban designer and planner in the planning consultant's office of Jack Meltzer & Associates, Chicago.