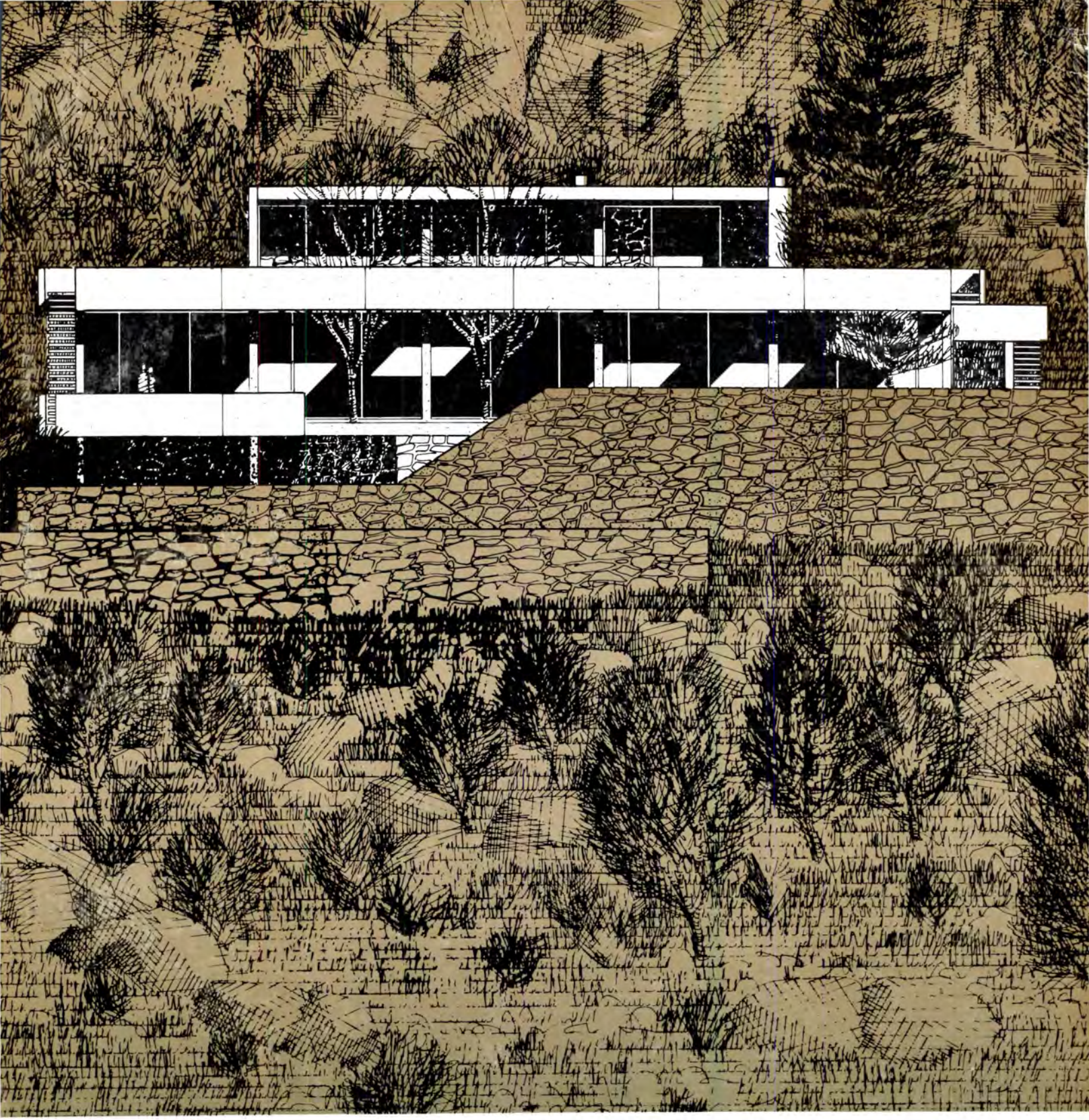

HOUSES BY BREUER: LABORATORY FOR DESIGN

MEATHE, KESSLER: THE PROPER USE OF PROPER MATERIALS

BUILDING TYPES STUDY: THE CHANGING ROLE OF THE OFFICE BUILDING

F. W. DODGE CONSTRUCTION OUTLOOK FOR 1967

FULL CONTENTS ON PAGES 4 AND 5

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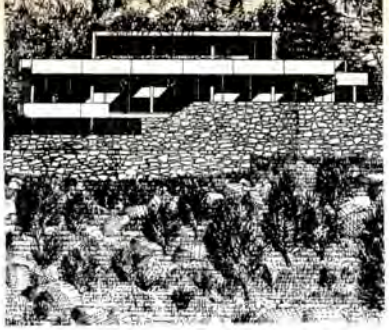

Cover: Koerfer house
Moscia, Tessin, Switzerland
Architects: Marcel Breuer and Herbert Beckhard

FEATURES

David G. Harris

BUILDING TYPES STUDY 364

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ARCHITECTURAL RECORD

CONTENTS: NOVEMBER 1966

ARCHITECTURAL ENGINEERING

THE RECORD REPORTS

COMING IN THE RECORD

RECREATION: FRESH OPPORTUNITIES FOR INVENTIVE DESIGN

The growing demand for recreation facilities of all kinds—public and private, for urban areas or countryside—offers the opportunity for architectural solutions to some new kinds of problems. Next month's Building Types Study takes a look at some of the fresh new ideas for providing useful spaces in the canyons of public housing projects, for making schoolyards something more than asphalt ball fields, and for recreation buildings ranging in scale from a tiny tennis club to a college stadium.

DEVELOPING AN ARCHITECTURE FOR UNDERDEVELOPED COUNTRIES

The significant role architecture—not just construction—could play in the social and economic development of "underdeveloped" countries has been little explored so far. In American Samoa, an energetic young governor is making it a major tool of development. The early results will be evaluated in a major feature.

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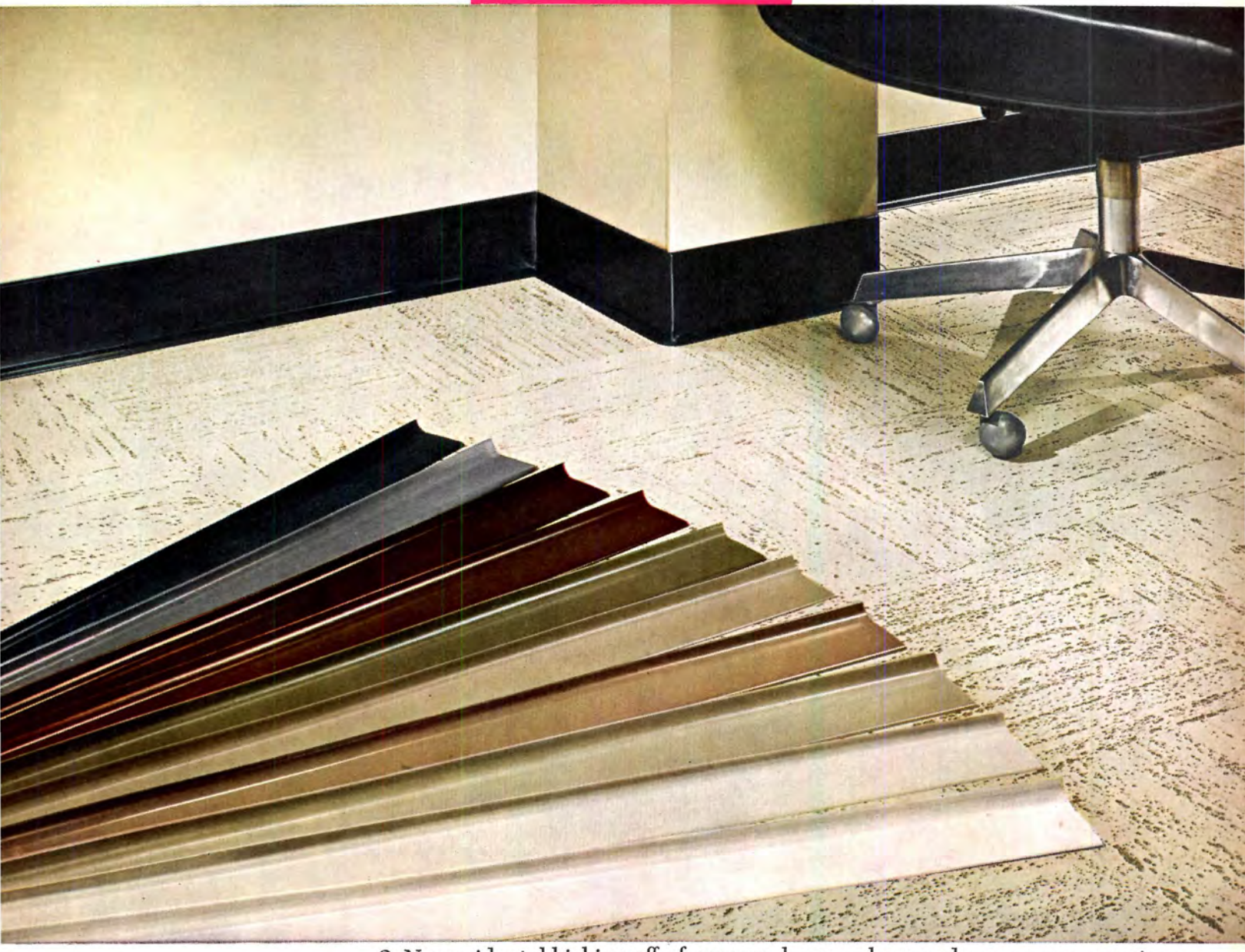

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The 720 exterior panels at Wesley Woods have an exposed quartz and quartzite aggregate that give color and texture. The panels were cast ahead of schedule and were available when the frame was ready for them. Most panels take a compound curved shape—curved horizontally to the curve of the round towers, and curved vertically through the spandrel area. The curved panels are 5′ x 8′; the flat panels for the connecting structure between the round towers are 4′ x 5′. All are anchored with welded clip angles. All fit perfectly without on-the-site cutting.

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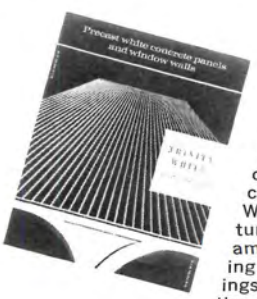

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NEW YORK'S ATTACK ON DESIGN MEDIOCRITY

This observer, wearing his badge as harsh and cynical critic, finds a promising note in a recent talk by Jason R. Nathan, New York City's Renewal Commissioner. I have frequently sounded off about mediocrity in virtually all governmental building operations; now we have a renewal commissioner offering what he calls a "five-point attack on monotony and mediocrity." Let us report his points, and wish him well with his efforts.

The five points are red tape, fees, design as a major criterion in land sales, attention to amenities, and landmarks preservation. Mr. Nathan said (to the New York Chapter of the A.I.A.): "They are a beginning, and they do represent our commitment in tangible terms."

Some improvement in the red tape habits of any governmental unit ought to be a sizeable contribution, and Mr. Nathan puts it positively:

"Let me say here and now that I have no toleration for red tape and bureaucratic second-guessing. Endless review of minutiae and lack of firm decisions will not insure good design; they *do* insure that our best designers and architects will refuse to work for HRB (Housing & Redevelopment Board)—and some of them have. I want the 'architectural drop-outs' back! We need you, and the city needs you."

Well, I hate to remind you, Mr. Nathan, that there's an old saying about governmental efforts to cut red tape, to the effect that public servants in government are experts at cutting red tape, but they always seem to cut it lengthwise. I couldn't resist that one, Mr. N., but I'll take off that cynic's badge now, and offer a cheer for your determination.

He makes the very sensible point that architects should be free from the constant looking over their shoulders. The effort here works two ways: not to forget the obligation to assure that available funds be spent sensibly, but also not to allow any project, economic or not, to proceed beyond a preliminary stage until the design concept has been approved. In other words, there is to be no approval without approval of architectural sketches and so on to establish the quality of the design. "This means that we are going to be much more interested in the selection of architects and, even in the case of large firms, in the assignment of top staff with the firm. . . ." And: "We are not going to second-guess the architects—the burden of responsibility for a creative solution within acceptable costs will be up to them."

Fees, Mr. Nathan said, were far too low to start with, but had been increased by 46 to 60 per cent. "I am re-opening the entire question of fees . . . but I will tell you now that, as a demanding client, I will expect you to demonstrate that higher fees will get the city better housing."

The point about land sales means simply the exercise of some design control when land is sold under Federal regulations. "HRB generally receives a tremendous response to any advertisement for sponsorship. With this embarrassment of riches, we are not going to settle for paucity of design. We are going to expect architectural quality from architects, and we are going to expect it from sponsors."

Point Four, "attention to amenities," deals with the treatment of open spaces, street furniture, pavements, signs, street lights, landscaping and the use of water in pools and fountains. Mr. Nathan assures that his board can have these amenities designed, that they need not be left to a dozen city bureaus. HRB is looking for imaginative design, and will see that other city departments cooperate.

That old favorite, Number Five, "landmarks preservation," also gets some kind words from the commissioner. Landmarks "are terribly important in the over-all feeling and soul of the city, which, after all, is what makes each city unique." He announces a joint program with the Landmarks Preservation Commission "to assure a new level of concern and sensitivity for landmarks buildings and historic districts."

Well, Mr. Commissioner, I hope you can make New York City a shining example of victory over governmental "monotony and mediocrity." I shall be glad to put away that cynic's badge if you do. At least I'll keep it out of sight when I'm in New York.

—Emerson Goble

Drawn for the RECORD *by Alan Dunn*

"You know how it is—
Money keeps getting tighter—"

Note from brave new world: sod, not seed, for lawns

During the drought a couple of years ago I thought I was pretending to belong to the affluent society when I had a nursery re-seed my lawn. Just a part of it. Cost me $400. Note: drought continued the next year, and my $400 worth of new lawn was lost.

The other day a friend showed me his burned out front lawn, smaller than mine, which he is having done over. For $1,500. With sod. No seeding, watering, weeding routine. Just new lawn—$1,500. Instant lawn.

He explained it all to this poverty-stricken fuddy duddy out of horse and buggy days. About quality control, wearing capabilities, and so on and so on. I hope for his sake that that sod is drought-resistant too.

The Wall Street Journal brings me more up to date with a story about sod as the modern lawn product, says that there are from 150 to 200 big sod growers, "tilling thousands of acres of turf for eventual sale to others."

My colleague who handed me the clipping said, "What a boon to architects! And what a boon especially to architectural magazine editors, who are always waiting for the lawns to show up well in the photographs."

"Must resign in protest," but then what happens?

After what I take it was a good hard scrap —at least he worked at it over three years—Architect Donn Emmons has resigned in protest from his post as architectural consultant to BART, San Francisco's rapid transit authority. And Lawrence Halprin, landscape consultant, announced that he would join Emmons on the outside.

Emmons said: "As an architect with obligations to the community and the profession I represent, I can no longer continue to endorse the program or lend it my name or that of my firm, Wurster, Bernardi & Emmons. . . . Nothing short of this drastic action can be effective.

"Engineers are making decisions that should be made by people with knowledge and interest in urban design. This is not a question of spending more, but of using what is available to best advantage. As ways to economize are diligently sought, a proper balance between planning, station design, amenities for rider convenience, and sophisticated engineering must be found. Each must be evaluated in terms of effect on the quality of the over-all system. . . . The truth is simply that there is not now a proper balance between engineering functions and planning. We have done our utmost to foster this balance, but to no avail. . . . We approach the point of no return. I feel that remedial steps must be taken immediately."

Can't go into it all now, but Emmons went on to protest decisions which violated architectural recommendations or considerations. It would not be hard to believe he had plenty to gripe about.

But it also sounds like an old and familiar story—architect can't stomach some governmental project, expresses his protest in the strongest possible terms: he resigns. His action is good for a fuss in the press, but the fuss is soon forgotten, and the architecturally misguided project rolls on its way, freed from the nuisance of those architects who were always protesting everything.

I don't know what Donn Emmons should have done, other than what he did do. But I keep thinking that in these cases there is something missing. If he resigns "out of obligation to the profession I represent," maybe that profession should organize some effort to protect him, or itself, or its community. There must be something more effective than simply letting the other side win.

Parking over the airfield, but not to save time

Because Toronto has tried the idea Paul Rudolph more or less facetiously suggested—that we cover airports with parking space—a reader comments thus on the chances of success:

"I was interested to read of Paul Rudolph's suggestion of a multi-story parking garage over the Kennedy airport in New York. I would suggest he fly to Toronto to examine a working example of this theory. There are, however, inherent weaknesses in this solution, for which many frustrated passengers can vouch. These problems, no doubt, can be overcome. Firstly, there is the problem of vertical movement, elevators which are too slow, too small and too few. Secondly there is the flow of cars through the parking levels, which is slow, especially at entrances (collecting tickets) and exits (paying) causing another problem. These conditions are naturally related to the number of people using the airport, either as passengers or as people depositing or *meeting* passengers. This situation is further aggravated at week ends by spectators, who use the airport as a Sunday treat for the children. People and traffic jams are quite common at these times, for the week end has the busiest flying schedules. While one is not likely (if you are not driving yourself) to miss the plane, it sometimes takes a very long time to extricate your car from the parking levels." —*E.G.*

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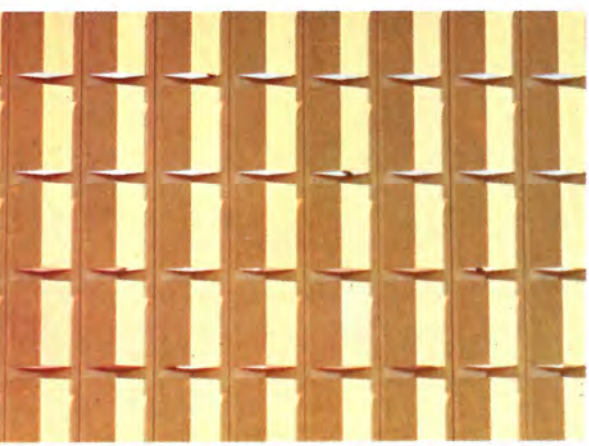

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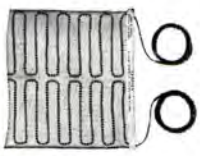

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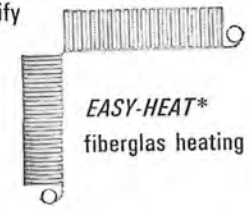

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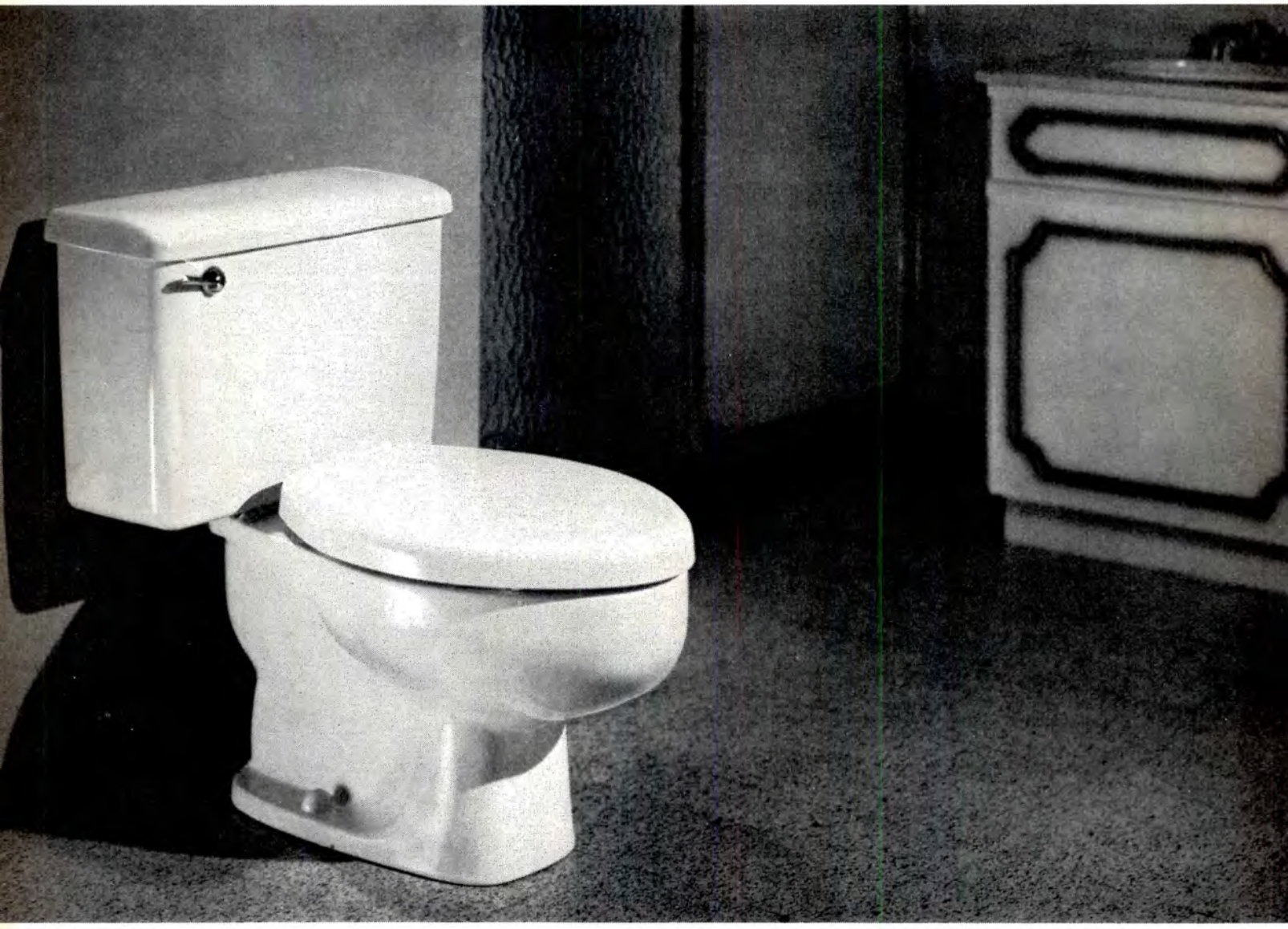

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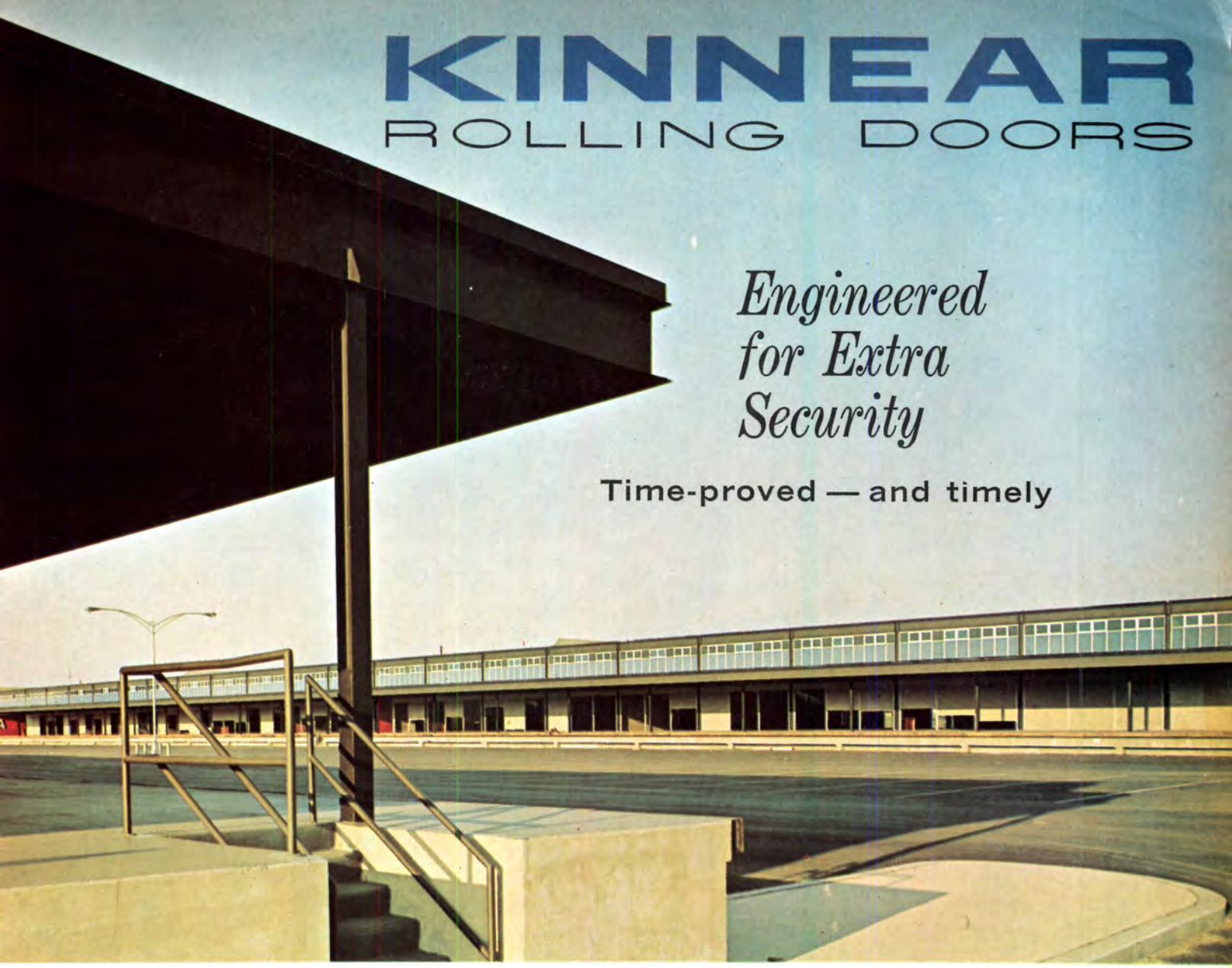

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F n S am n u liz c mic in campus rejuvenation at Newark College of Engineering.

Two new buildings on this New Jersey campus make extensive use of ceramic tile for its functional and decorative characteristics. Shown here are areas in the new "Student Center" and the "Franklin Newlin Entwisle Physical Education Building." The latter has an interior finished almost entirely in ceramic tile. A focal point is the abstract ceramic mosaic mural which covers one entire wall of the natatorium. A smaller mural decorates the opposite, entrance wall.

In the student center glazed wall tile is used throughout the kitchen, cafeteria and rest rooms. It complements the quarry tile and ceramic mosaic tile floors in these areas.

Located on land adjacent to the existing campus, the buildings erected by Walter Kidde Constructors are of precast concrete construction. The night photo above presents a dramatic view of an unusual post-tensioned barrel vault roof on the physical education building. Mosaic tile murals in the building were designed by Epple and Seaman and installed by Del Turco Bros. of Newark.

If you're looking for a material with limitless possibilities in combined decorative and functional use, look for ceramic tile made in the U.S.A. and Quality Certified by the Tile Council of America. The triangular seal at right is your assurance of glazed wall tile, ceramic mosaic tile and quarry tile that is tested to meet the most rigid government specifications. For more information about Certified Quality tile, a material that can be used with confidence indoors and out, write: Tile Council of America, Inc., 800 Second Avenue, New York, N.Y. 10017. Or, see the current Sweets Architectural File.

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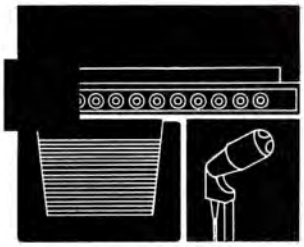
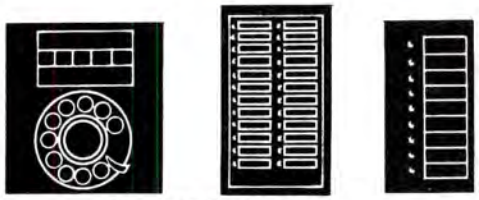
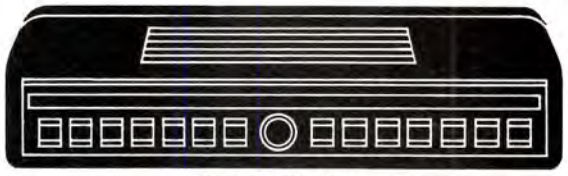
For more data, circle 9 on inquiry card



Sound Systems

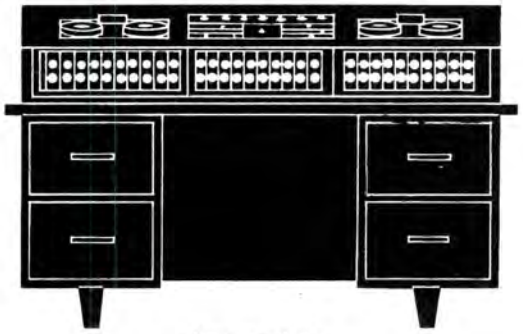


Personnel Registry Systems

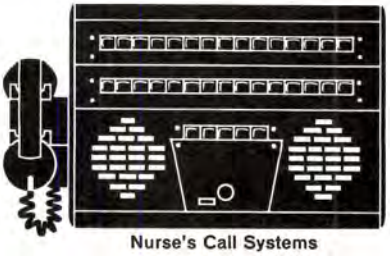


Intercom Systems

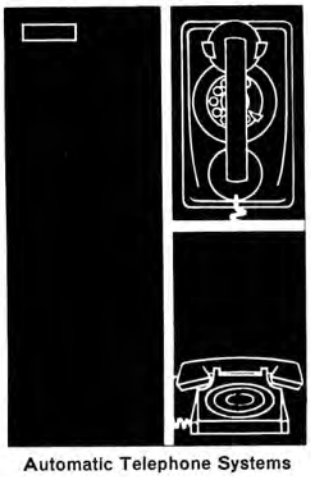
Central Call Systems



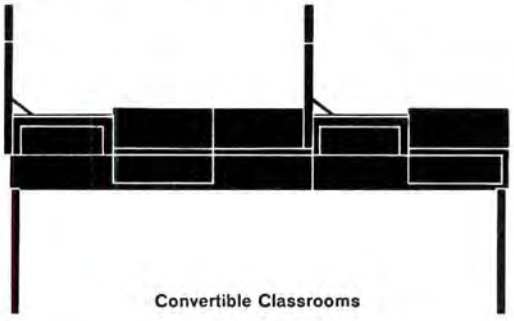
Language Labs



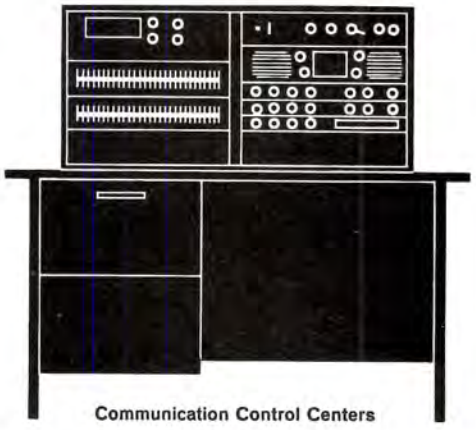
Nurse's Call Systems



Automatic Telephone Systems



Convertible Classrooms



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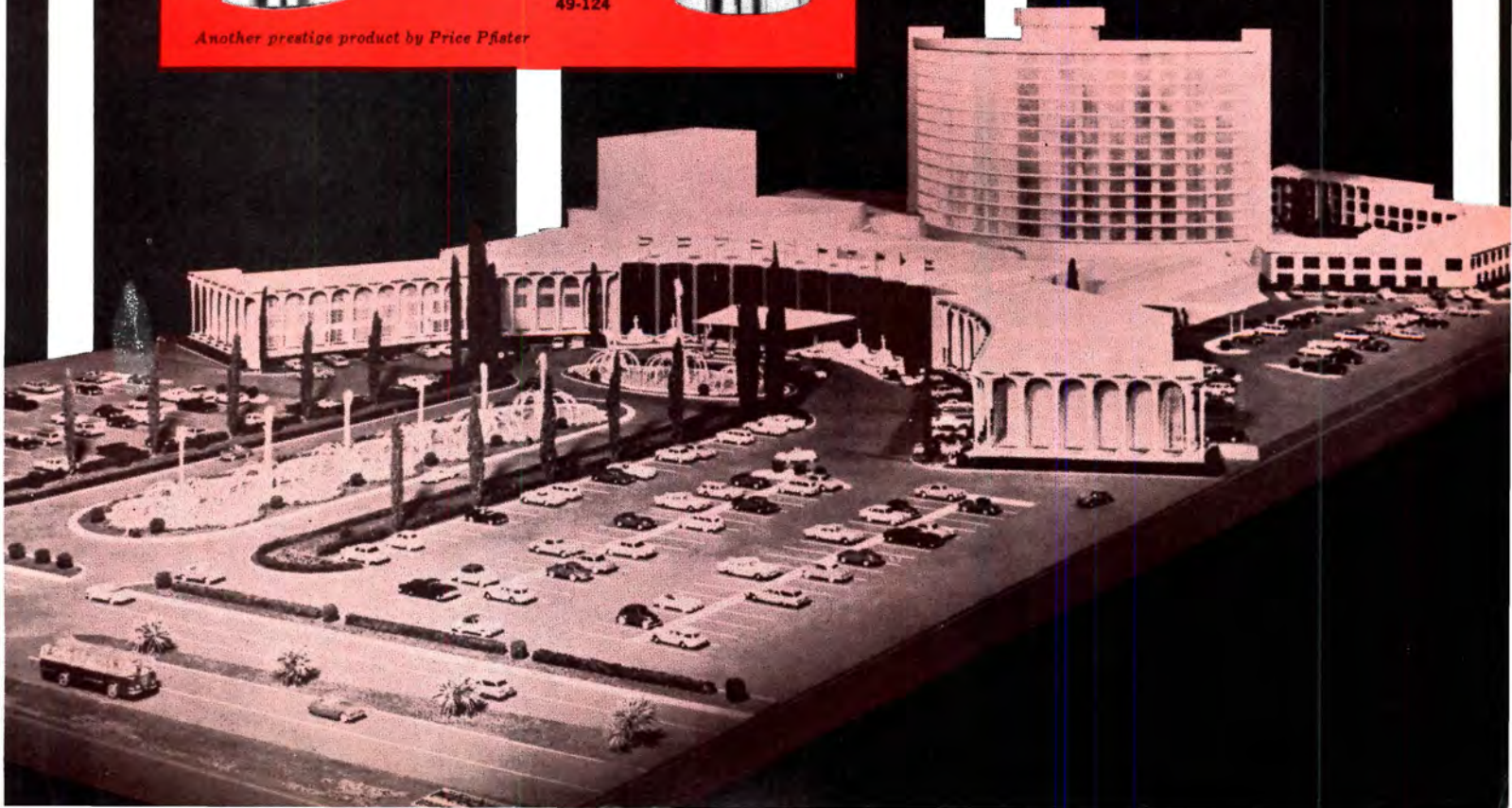

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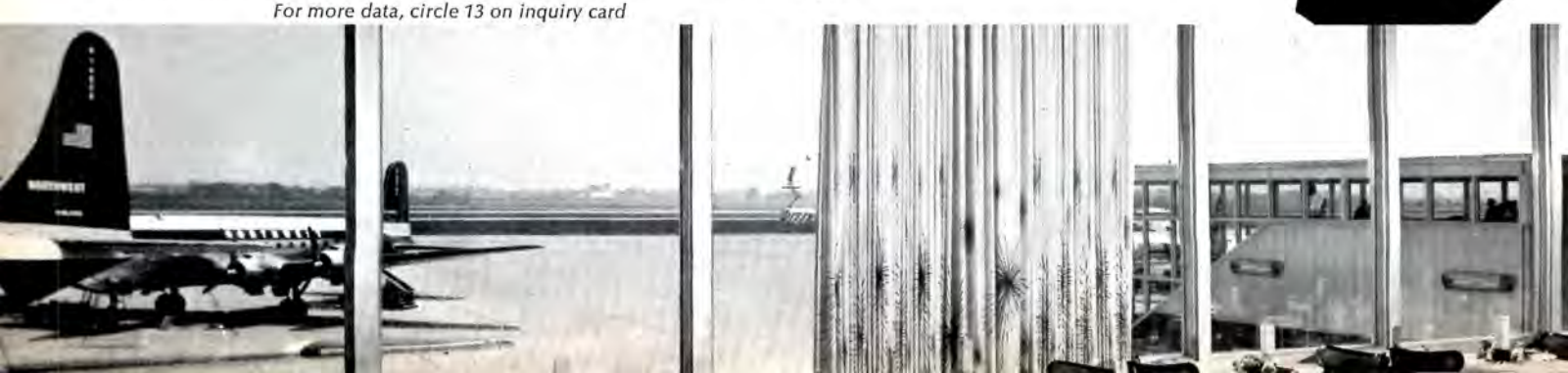
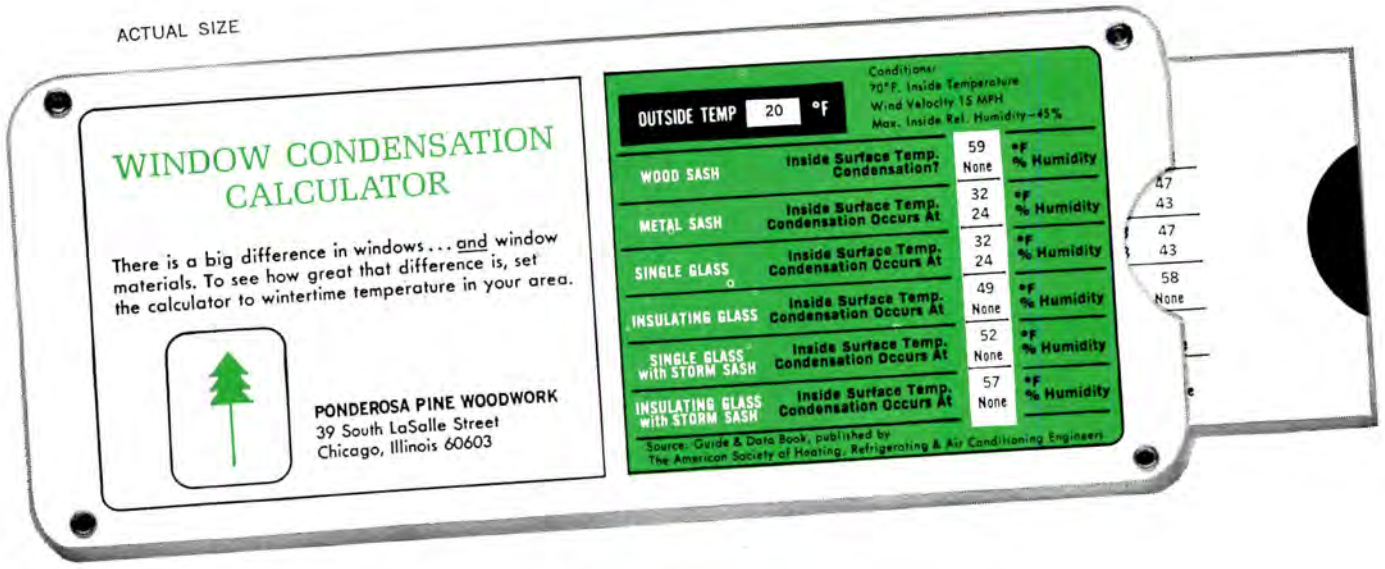


Wood windows vs. metal windows:

This calculator will give you the facts about condensation in your area.



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From coast to coast and border to border, wherever cold winds blow, condensation on windows can be a problem for home owners. It drip, drip, drips down the wall and ruins wallpaper and plaster. All this can be avoided with the right kind of window.

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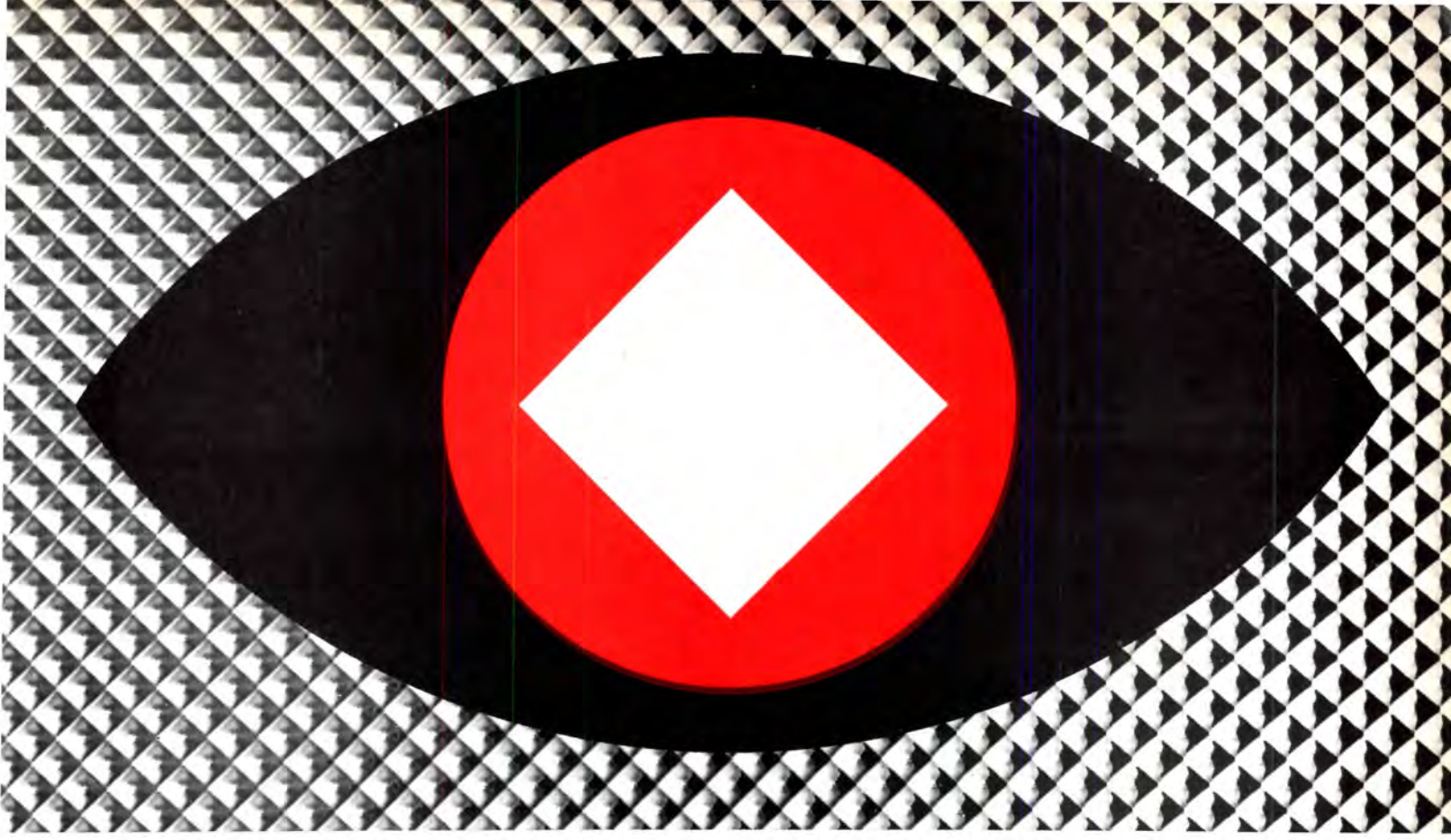

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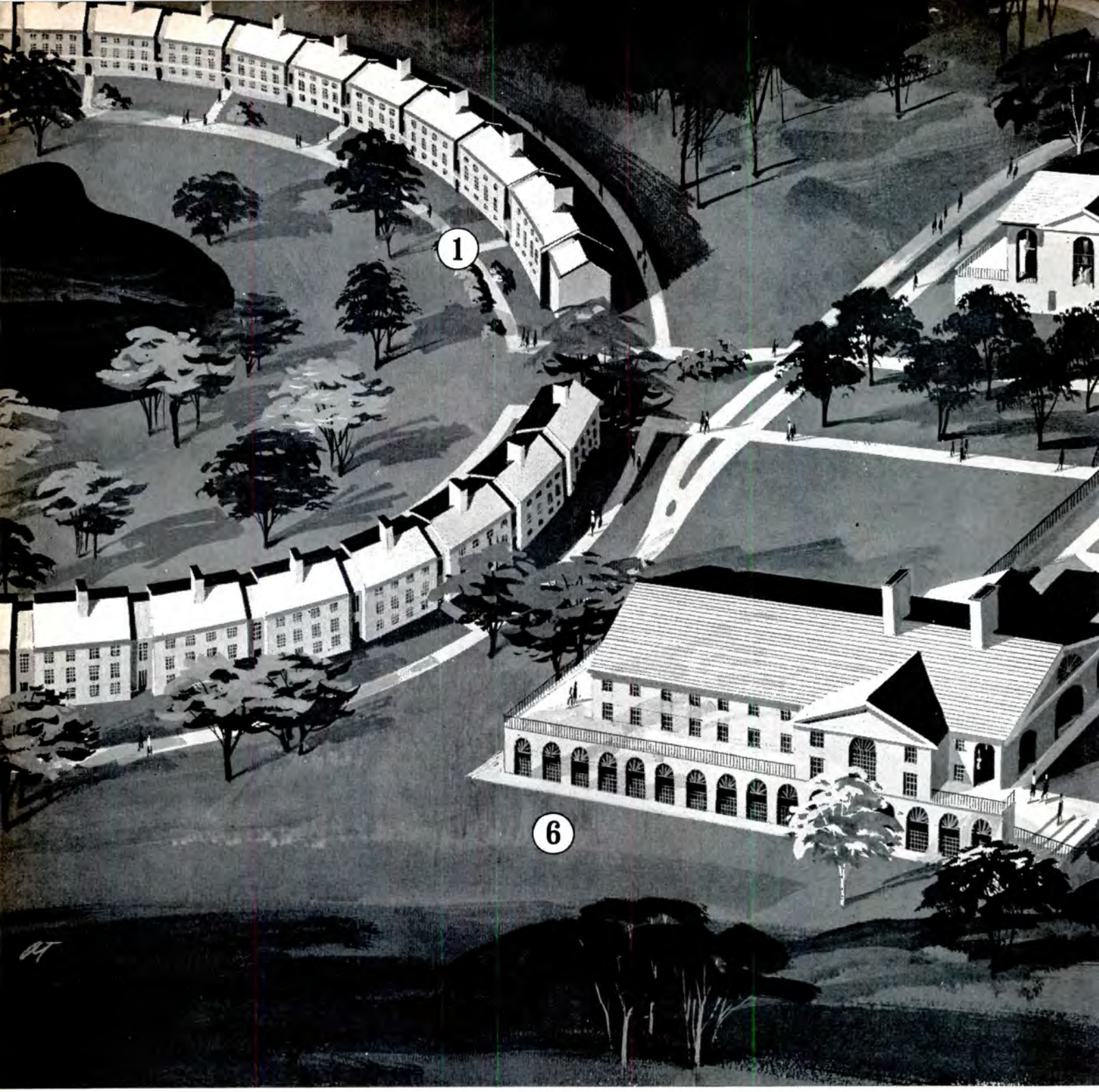


Bentley College of Boston selects all-electric design for new Waltham campus...finds costs competitive, operating advantages conclusive

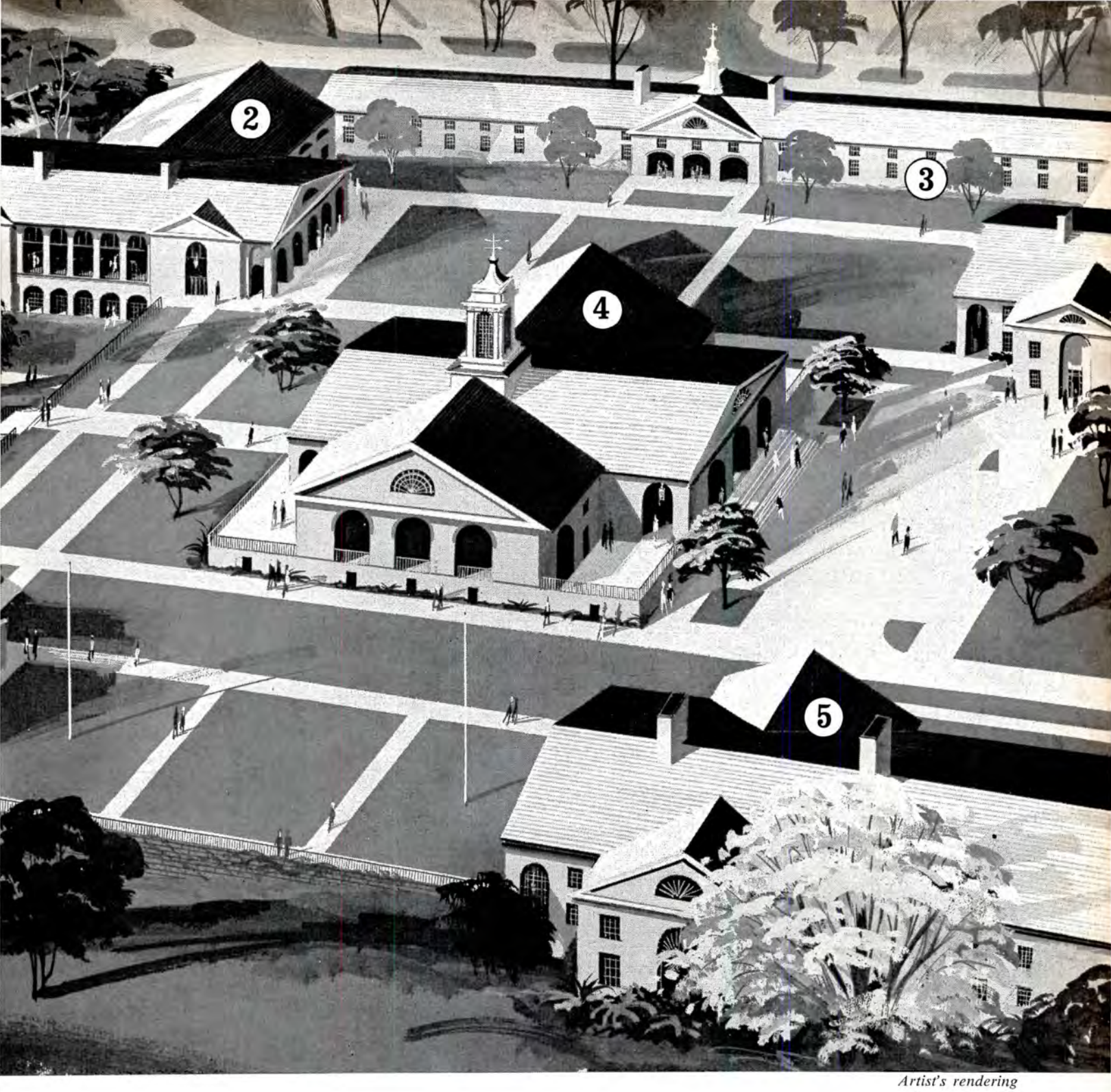
When the Board of Trustees of Bentley College, a professional college of accounting and finance, started planning their new $25-million, 102-acre campus in Waltham, Massachusetts, this was their goal:

> to create an environment which was completely conducive to serious academic pursuits, beautiful to the eye, *and thoroughly* functional.

Comparison studies with other methods convinced them that an all-electric campus, employing flameless electric heating and cooling, would best meet their requirements.

Quiet operation and individual room temperature controls would provide a better atmosphere for study. The cleanliness of an electric system would mean reduced housekeeping and maintenance costs. Elimination of boiler rooms and bulky equipment would allow building space to be utilized more efficiently.

As to cost, two independent feasibility studies showed that—compared with a fossil-fuel system—annual owning and operating costs for the electric heating and cooling system would be equal, or possibly even less.



Artist's rendering

And with capital funds at a premium, an initial capital outlay of almost $600,000 would not be necessary by eliminating a central heating plant and underground piping system.

As in the case of Bentley College, modern all-electric design offers environmental and economic benefits for any type of construction. For more facts about applying these proved advantages in your institutional, commercial or industrial buildings, contact your electric utility company. They will welcome the opportunity to work with you.

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Plan for new Bentley College Campus

WALTHAM, MASSACHUSETTS

Architect: Perry, Shaw, Hepburn and Dean, Boston.
Engineer: Syska & Hennessey, New York.

1. Dormitory Complex: Seven residence houses for 510 students to be built initially. 95,000 sq. ft.

2. Student Center: Dining for 440, snack bar seating 550, college store, lounge, exercise facilities. 45,000 sq. ft.

3. Faculty-Administration Building: 125 offices, facilities for ancillary services. 50,000 sq. ft.

4. Baker-Vanguard Library: Stacks for 150,000 volumes, expansion provision for an additional 100,000 volumes. Seating for 750. 45,000 sq. ft.

5. Lecture Hall: Ten 108-man lecture halls, two 216-man lecture halls, computer laboratory. 45,000 sq. ft.

6. Classroom Building: 40 small classrooms, four science laboratories. 60,000 sq. ft.

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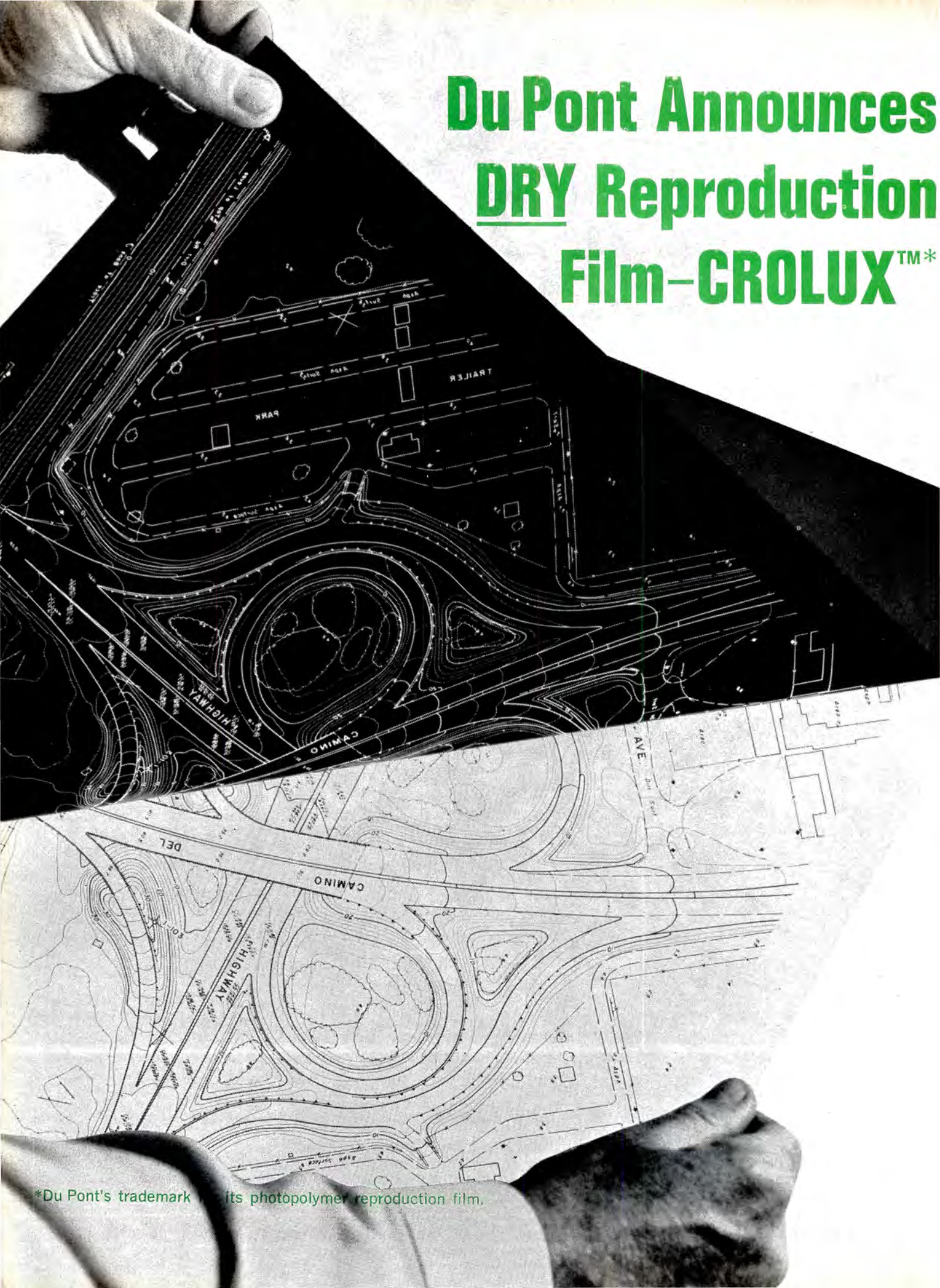
Du Pont Announces DRY Reproduction Film–CROLUX™*



*Du Pont's trademark for its photopolymer reproduction film.

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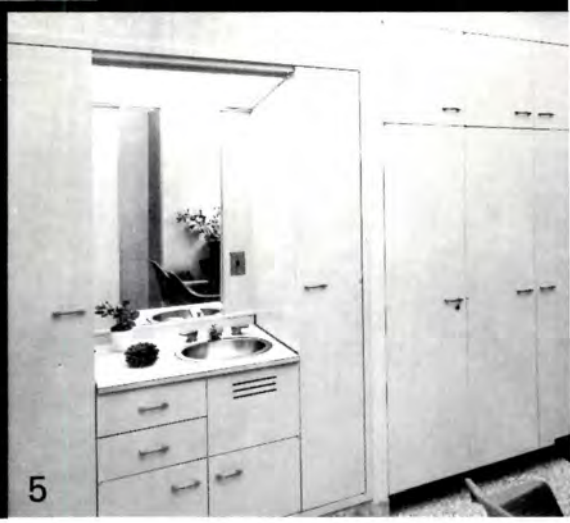
2. Employee Convenience Center
3. Executive Washroom
4. Executive Dining Room
5. Wardrobe and Storage Wall
6. Laboratory Test Kitchen



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Congress passes $1.2-billion Demonstration Cities Bill

In a tremendous victory for President Lyndon Johnson towards implementing his "Great Society" program, both houses of Congress have passed the Demonstration Cities Bill. It will funnel $1.2 billion in the next three years into comprehensively rebuilding slum areas in cities on a large neighborhood scale. The bill will merge social and welfare programs with the actual physical rehabilitation of slum areas. The bill authorizes $900 million to be distributed among selected cities in this way. The bill also provides $24 million to help the chosen cities to plan their projects, $75 million to encourage metropolitan planning, and funds to aid developers of new towns.

Although there is no direct mention of design objectives in the bill, a colloquy between Representative Henry Reuss (D., Wisconsin) and Representative James Scheuer (D., New York) on the House floor, established a "verbal directive" on the subject. "All housing built with Federal assistance," said Mr. Scheuer, "should provide not only good shelter for the people living there, but should also provide a positive environmental influence upon the surrounding neighborhood. The kind of influence stemming from fine architecture and design, exciting in form and color, will fortify and support the local tax values as well as local neighborhood attractiveness and stability. So this would represent good economics as well as good environmental planning and design."

As we go to press, the bill is in a Senate-House conference to reconcile differences between the Senate and House versions of the bill. It is soon expected to go to President Johnson for his approval and signature.

Schmidt named commissioner Of Public Buildings Service

William A. Schmidt, a civil engineer who has been with the General Services Administration, Washington, D.C., since 1941, has been named Commissioner of GSA's Public Buildings Service, succeeding Casper F. Hegner, the first architect to hold the job, who left his post in August to return to the Veterans Administration. Mr. Schmidt had been Acting Commissioner since Mr. Hegner's departure. The new commissioner is a member of the Federal Construction Council of The Building Research Advisory Board, and is on Mrs. Lyndon Johnson's Committee for Beautifying Washington. Mr. Schmidt's new deputy is Robert B. Foster, formerly of the Army Corps of Engineers, who recently has helped to direct The Public Land Law Review.

Federal education bills include fine arts provisions

In a series of amendments to Federal education legislation by Representative James Scheuer (D., New York), provisions have been made to encourage excellence of architecture, and design, and inclusion of fine arts in Federally financed school projects. In all, amendments were added to three bills which have passed both houses and which are now in Senate-House conferences prior to being sent to the President. The three bills affected by the amendments are: The Elementary and Secondary Education Act of 1965; The Higher Education Act of 1963; and The Model Secondary School for the Deaf Act of 1966.

In a series of three amendments to the elementary education act, the Commissioner of Education would require that "due consideration be given to excellence of architecture and design," and to this end, 1 per cent of project cost will be devoted to fine art "amenities." In the higher education act, an amendment stipulates that "not more than 1 per cent of project cost" be devoted to fine arts. In the Model Secondary School for the Deaf Act, an act that establishes a prototype facility in the Washington, D.C. area to be operated by Gallaudet College, the amendment provides that "In the design and construction of any facilities, maximum attention will be given to excellence of architecture and design, works of art, and innovative auditory and visual devices appropriate for the educational functions of such facilities."

International competition open for Finland town center design

The Township of Espoo, Finland, outside of Helsinki, is holding an open "international competition of ideas" for design of its town center. The sponsors of the competition do not seek a final solution of the town plan, but rather seek to have illustrations of various possible solutions. The competition is approved by the Union Internationale des Architectes and The Association of Finnish Architects (SAFA). The jury, which includes three architects—Giovanni Astengo of Turin, Georges Candilis of Paris, and Aarno Ruusuvuori of Helsinki—will proportionately allocate $30,000 in prizes for winning designs. Registration date is November 10, and forms can be obtained from professional advisor Mr. Martti I. Jaatinen, architect SAFA, Mannerheimintie 45 A 15, Helsinki 25, Finland.

Architects retained to design Seattle rapid transit system

At almost the same time as an architect of BART resigned (see page 10), it has been announced that the Seattle firm of Naramore, Bain, Brady & Johanson, associated with the San Francisco firm of Okamoto & Liskamm, has been retained to prepare designs for Seattle's proposed rapid transit system. The architectural firms will work under the direction of DeLeuw, Cather & Company, over-all engineering consultants for the design.

Congress approves new Department of Transportation

Congress has approved a new Cabinet-level Department of Transportation which will bring 34 Federal agencies under one administrator. Purpose of the new department is to achieve a coordination in planning transportation facilities, particularly Federally aided highways. Included in the new department will be the Federal Aviation Agency, the Coast Guard, the Civil Aeronautics Board, the Bureau of Public Roads, and parts of the Interstate Commerce Commission.

Computer-aided design: will architects be left out?

A national conference on computer-aided design was held at M.I.T. on September 30 and October 1. Underwritten by the Institute of Applied Technology of the National Bureau of Standards, the conference brought together research workers in a wide variety of areas bearing on the use of computers as an aid in designing buildings. The work discussed by participants ranged from the kind of design analysis first proposed by Christopher Alexander to computerized specification writing and cost estimating. In addition, participants from M.I.T. explained some of the latest developments in their research projects on computer graphics, time sharing, and master programing languages for varying kinds of problems.

The programers who are designing the computer-aided design procedures and the "user" groups, the architects and engineers, seemed to have considerable trouble in communicating with each other. The problems of developing a standardized computer language are all but incomprehensible to the "users", while the programers find many of the application problems trivial and illogical. The architectural profession, which could conceivably provide the missing link between concept and execution, was not really heard from, and the basic conceptual problems of building design were hardly discussed at all.

In general, the applications of the computer to building design could be divided into those that could be realized in some form right now, such as computerized specification, and such developments as a graphic display system for all elements of the design process, which might be five or more years away. The real problem for the architect is how to participate in the development of these important new methods, without premature investment in equipment and procedures that could soon prove obsolete.

If the state of affairs reflected in this conference continues, there is every likelihood that the architectural profession will be all but left out of the development of design systems that may be of central importance to architecture in a few years' time.

Alonzo J. Harriman is dead at age 68

Alonzo J. Harriman, treasurer of the architectural firm of Alonzo J. Harriman Associates, Inc., Auburn, Maine, died September 9 at the age of 68. Mr. Harriman was elected to fellowship in the American Institute of Architects for service to the Institute in 1961. Mr. Harriman was New England regional director of the A.I.A. from 1959 to 1961. He was a past president and secretary of the Maine chapter of the A.I.A. and was a member of the National Council of Architectural Registration Boards and the State of Maine Architectural Registration Board. From 1964 until the time of his death Mr. Harriman was a director of the Building Research Institute.

New York report calls for single planning agency to operate on decentralized basis

"Let There Be Commitment—a Housing, Planning and Development Program for New York City," the formal name for a year-long study prepared for Mayor Lindsay and the Institute of Public Administration by Edward J. Logue, administrator of the Boston Redevelopment Agency, is a frank, succinct document which offers far-reaching policy and organizational proposals to deal with "the massive breakdown in the functioning of both local government and the private enterprise system" in cities. Most of urban America shares these problems, says Mr. Logue, but "the very size of both New York and its slums makes a solution to New York's problem more urgent than for any other city."

In preparing the report Mr. Logue enlisted the aid of a group of practitioners in the fields of housing, city planning and urban renewal. Included in this study group were: William L. Rafsky, executive vice president, Old Philadelphia Development Corp.; architect David A. Crane, Chairman of Civic Design, Department of City Planning, Graduate School of Fine Arts, University of Pennsylvania; M. Justin Herman, executive director, San Francisco Redevelopment Agency; Robert B. Pease, executive director, Pittsburgh Redevelopment Authority; William L. C. Wheaton, director, Institute of Urban & Regional Development, University of California, Berkeley; Anthony G. Adinolfi, Manager of Planning, State University Construction Fund, New York; Harold Grabino, former executive director and general counsel, New Haven Redevelopment Agency; and Hugh Mields, associate director, United States Conference of Mayors. Executive director for the study group was Robert G. Hazen, director of downtown renewal, Boston Redevelopment Authority.

The major recommendation set forth in the study (which is commonly called the Logue Report) is to group all the municipal functions relating to planning, housing and development in one agency, operating on a decentralized basis, headed by an administrator who is responsible to the Mayor. The report points out that New York City has scattered the various functions relating to urban renewal more widely than any city in the nation. The agency would be decentralized into 10 areas, with each area administrator operating a staff organization similar to the central body, and having broad authority for decision making. The purpose of this decentralization, stated over and over again in the report, is "to bring government back to the people . . . to make it responsive to the needs of the people."

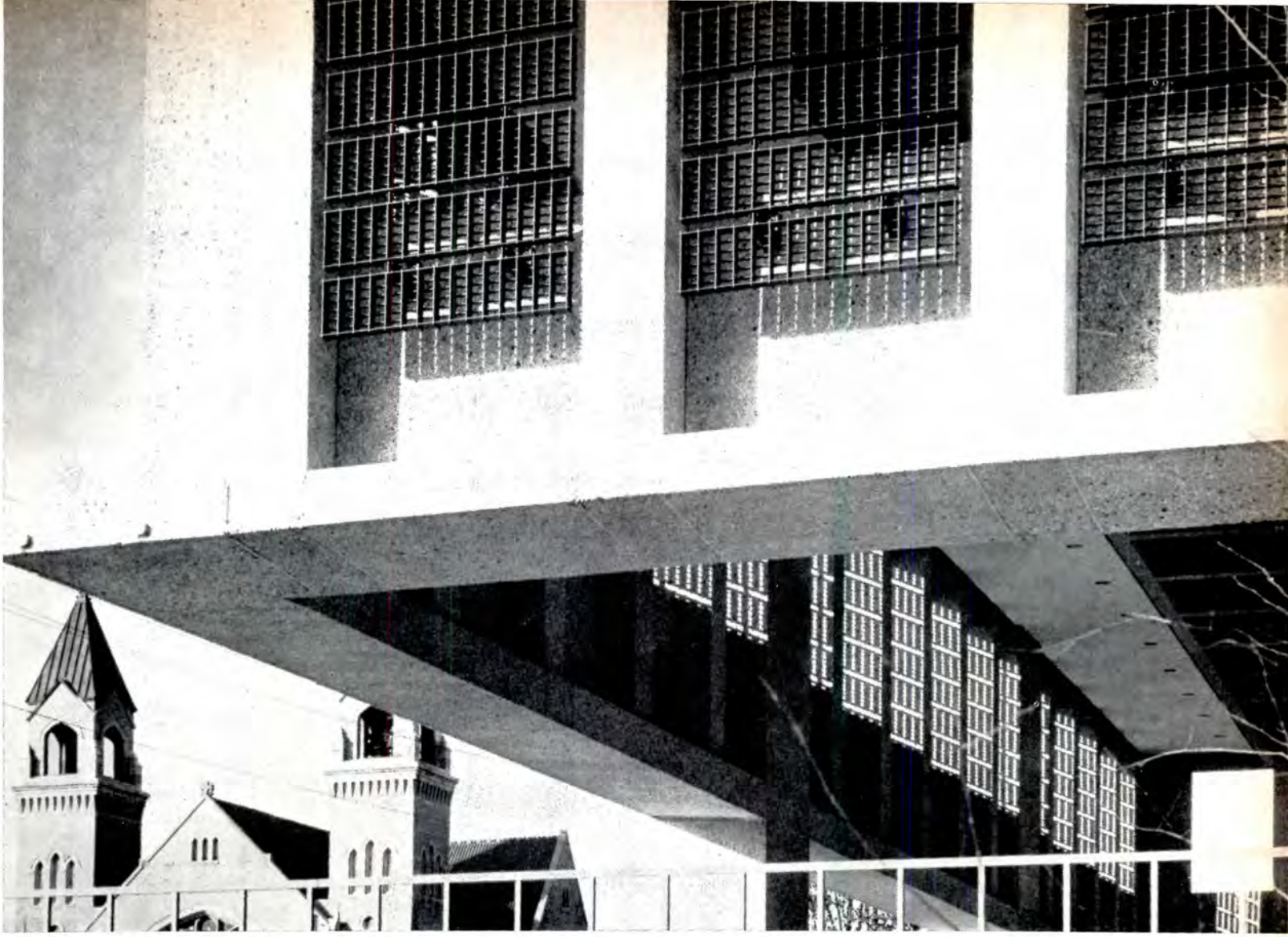
The authority to select architects for all public buildings except schools would be transferred to the new agency "which will have the necessary staff, concern and sensitivity." The city "must place increased emphasis and importance on the design of structures and the urban environment."

The single exception to this policy of decentralization is the New York City Planning Commission, referred to in the report as presently being in the "ambivalent position of Delphic Oracle, Court of Last Resort, Spot Planner and Decision Maker. . . . The planning staff must be an integral part of a development team dedicated to carrying out plans as well as preparing them. An artificial separation between plans and action is not maintained in any other area of government or business."

The Logue Report goes on to make specific program suggestions to solve New York's many problems by assigning priorities to various areas of the city. Of first priority are the city's three major slum ghettos. The report calls for each of these large areas to be treated as a single urban renewal area instead of the past approach of "delineating relatively small areas which could not have a community-wide impact."

For blighted areas outside the ghettos and of lower priority, the report recommends a combination of urban renewal and intensive code enforcement to help stabilize them. "Such a program will protect these areas from the ripple effect of large-scale programs in the ghettos."

For the still predominantly sound and stable areas which lie in the apparent path of not too distant blight, the report calls for effective conservation and rehabilitation programs and a stepping-up of the quality of city services. It is essential that these programs be put underway in presently sound areas, says Mr. Logue. "Otherwise, the certain consequence of exclusive concentration on today's slum-ghettos will be the creation of other slum-ghettos elsewhere."



BORDEN DECOR PANEL: Custom Design Screening

The North Carolina Mutual Life Insurance Co. building in Durham, North Carolina, is shown here. Designed by Welton Becket, F.A.I.A., Architect, of New York City, this multi-story structure utilizes custom designed screening of Borden Decor Panel in rich Kalcolor Bronze finish.

Created to complement and enhance the character of the building, the Decor Panel screens were custom designed and specified, individually fabricated, and tailored for special erection methods—all within a fixed budget. The savings effected by Borden's fabrication and erection techniques made it possible for the architect to use the handsome bronze finish as well—still within the initial budget.

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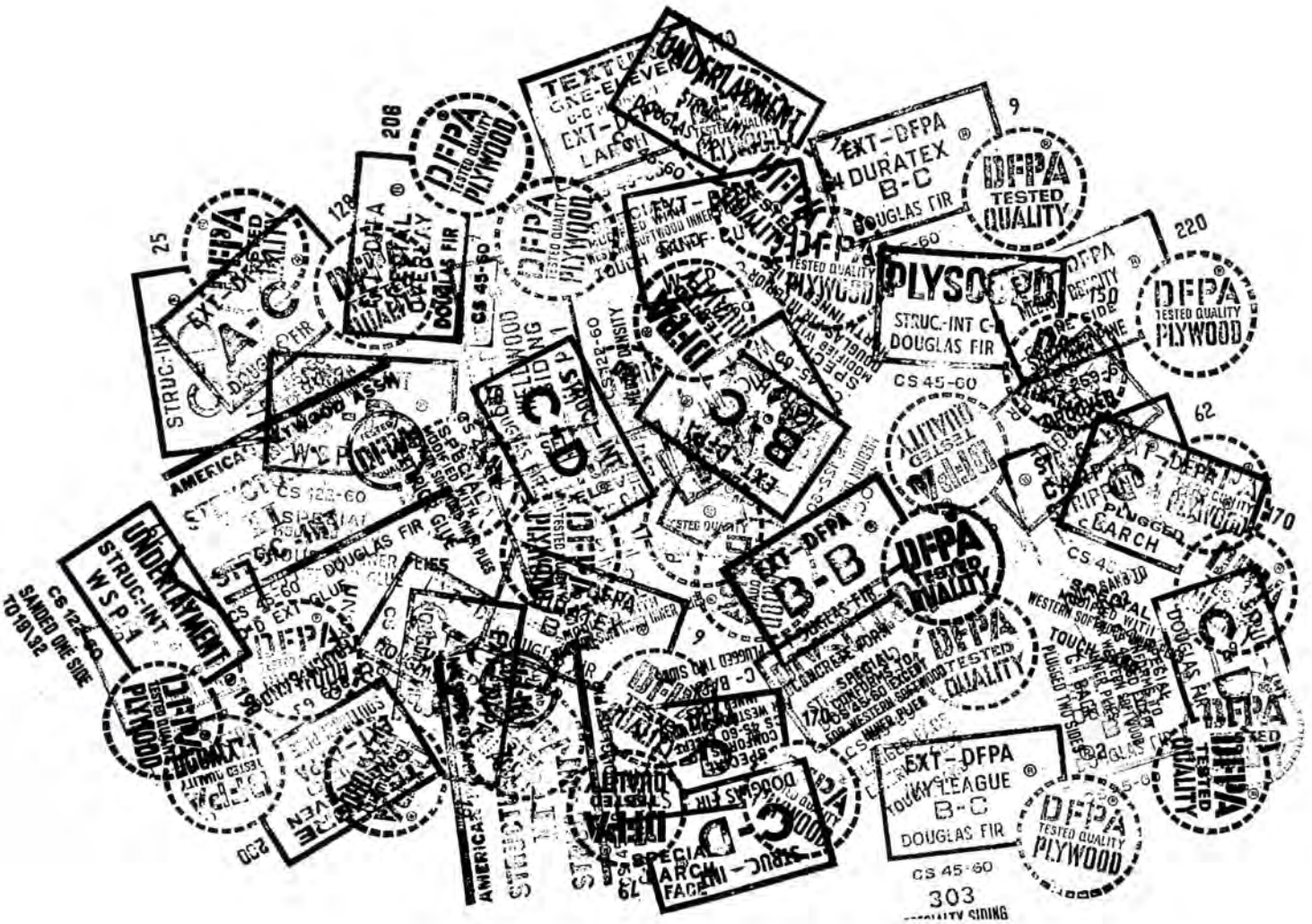

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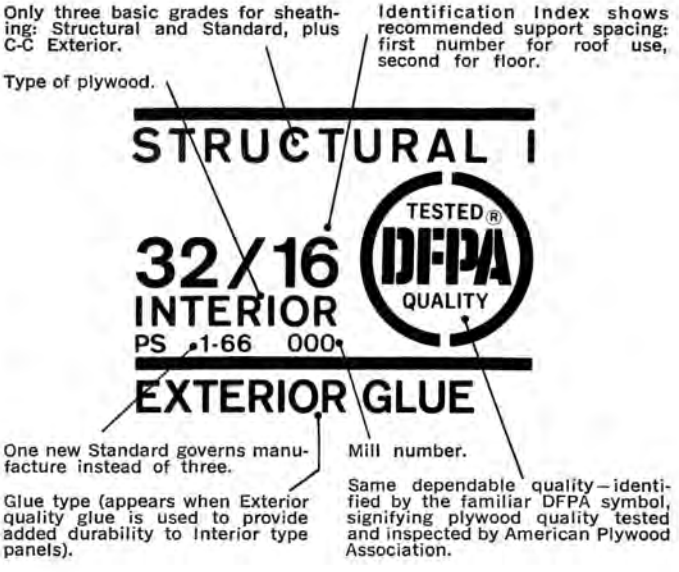

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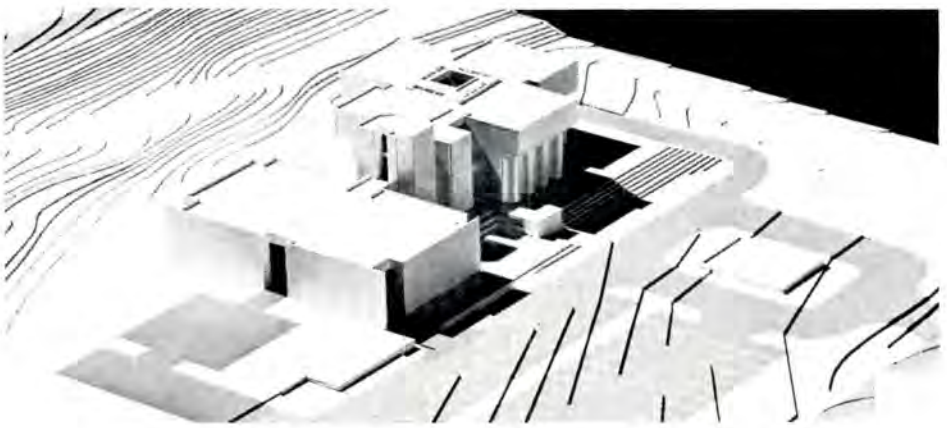
The West Seneca Children's Psychiatric Hospital, West Seneca, New York, designed by Charles Kawecki, State Architect, Department of Public Works with James Stewart Polshek, design consultant and associate architect, is intended to represent a middle ground between the typical school-home atmosphere and the typical hospital atmosphere. The structure, organized around a courtyard, houses classrooms, recreation areas, diagnostic section, residential areas for 125, a 16-bed infirmary, and outpatient facilities for 75. The structure will be built under the auspices of the State of New York Mental Hygiene Facilities Improvement Fund.



Headquarters building for Structural Clay Products Institute, located in Fairfax County, Virginia, on the outskirts of Washington, D.C., and designed by Charles M. Goodman, will consist of a three-story building composed of four pavilions surrounding a courtyard joined by two service towers to a rectangular building which will house research facilities and staff. The all-brick structure, of bearing wall construction, will provide 35,000 square feet of floor space and will cost $700,000. General contractor is Westgate Corporation.

Lawrence S. Williams, Inc.

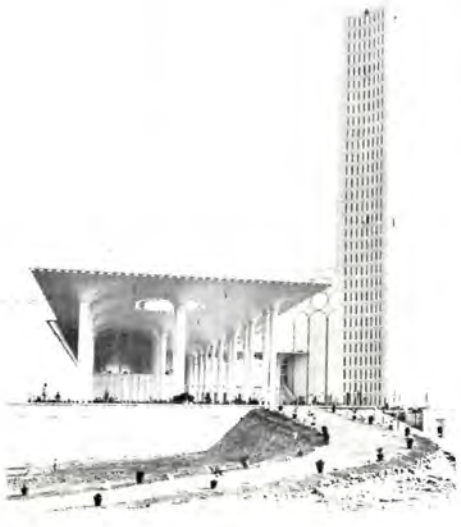
A science building and student center for Barnard College, New York City, designed by Vincent G. Kling & Associates, organizes both buildings around a plaza which serves as a focal point for activity related to adjacent campus spaces. The 12-story science building will house laboratories, offices, classroom and a 240-seat plaza-level lecture hall. The tower has a 60-foot clear span structural system to achieve maximum flexibility. The single-story student center also utilizes the first level below the plaza. Cost of the complex will be $8.5 million. The science building was given an award of merit in the HEW awards program (see page 42).

Julius Shulman photos

The National Cowboy Hall of Fame and Western Heritage Center, Oklahoma City, designed by Begrow & Brown Architects, winners of a 1957 competition for design of the structure (December, 1957, pages 10 and 11), is finally complete in its first stage. It consists of three elements around a pool: the 12,800-square-foot Hall of Fame under two units of concrete aggregate roofs, each unit consisting of four paraboloids; a 44,800-square-foot, two-story wing for exhibitions and administration; and an entrance canopy. Associated architects for the $2.5-million structure were Sorey, Hill & Binnicker and general contractor was Lippert Brothers, Inc.

An electron synchrotron facility at Cornell University, Ithaca, New York, designed by Ian Mackinlay and Associates, has three above-ground elements which are support facilities for an $11.3-million accelerator located in a half-mile underground tunnel. The three above-ground elements include: a 25,000-square-foot, six-story structure which will contain mechanical equipment and a smaller accelerator; a 10,000-square-foot, 40-foot-high open hall which will contain synchrotron experimental apparatus; and a three-story unit containing 20,000 square feet of laboratory and office space. General contractor for the $3.7-million building is Irwin & Leighton, Inc.

Jeremiah O. Bragstad



The Pakistan Institute of Nuclear Science and Technology at Islamabad, left, designed by Edward Durrell Stone, has been completed in its first phase. The poured-in-place concrete structures for the self-contained scientific campus include: a nuclear reactor within a domed structure, a cooling tower for the reactor, and a three-level structure for administrative and support facilities.

A bank and office building, right, for the Bank of California, Portland, Oregon, designed by Anshen & Allen, consists of a street level banking hall topped by a 14-story office tower. Parking and drive-in banking facilities are located underground. Consulting architects for the $11-million, 400,000-square-foot structure are Barnes, Hilgers & Maslen. Construction will start in January, 1967.

William J. Rader

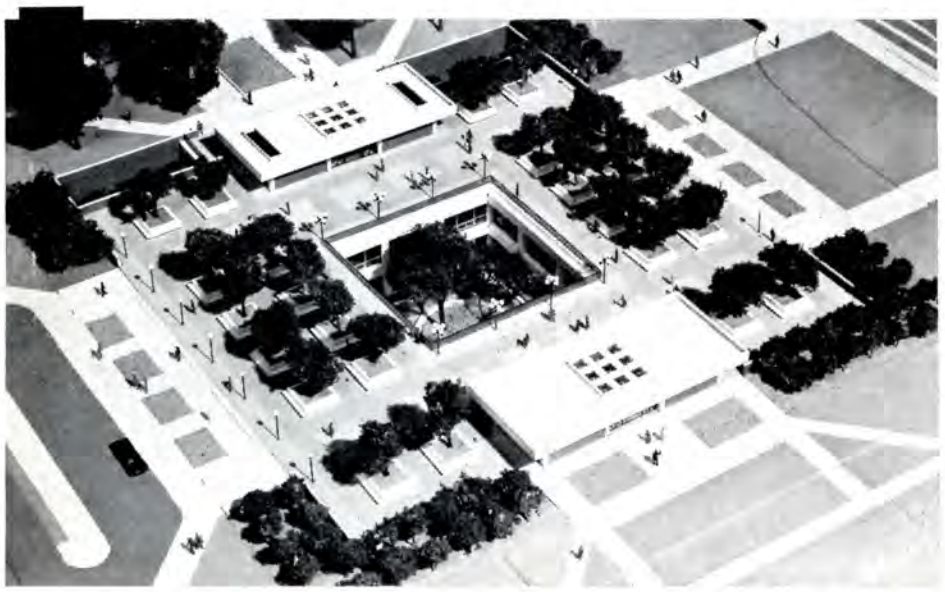
Bureau of Higher Education honors 29 projects in its new design awards program

Seven first honor awards (shown here), 20 awards of merit, and two special mentions have been presented in the first design award program of the Bureau of Higher Education of the Department of Health, Education and Welfare. The program was jointly sponsored by BHE, the American Institute of Architects, and Educational Facilities Laboratories, Inc. The purpose of the program: "to recognize superior quality in the design of college facilities . . . and to promote a greater understanding of the need for comprehensive campus development planning." Projects eligible were those for which applications for Federal grants or loans had been approved by the Office of Education under the Higher Education Facilities Act of 1963. The 258 entries were judged in five categories: general classroom buildings, science and laboratory buildings, libraries, graduate schools, and long-range campus development plans—both completed buildings and projects. Serving on the jury were architects James M. Hunter (as chairman), Norman C. Fletcher, and Colden Florance; Richard P. Dober, campus planner and author; and Herbert E. Longenecker, president, Tulane University, New Orleans.

Phokion Karas

Nils Yngve Wessell Library, Tufts University, Medford, Massachusetts. Architects: Campbell, Aldrich and Nulty; structural engineers: William J. Le Messurier Associates, Inc.; mechanical engineers: Jackson & Moreland, Inc.; interior consultants: Bill Bagnall Associates; contractor: George A. Fuller Company.

Engineering Sciences Center (undergraduate portion), University of Colorado, Boulder. Architects: Architectural Associates of Colorado (Members: W. C. Muchow, Partner-in-charge; Fisher & Davis; Ketchum, Konkel, Ryan & Fleming; Hobart Wagener); architectural consultant: Pietro Belluschi; structural engineer: Ketchum, Konkel, Ryan & Fleming; mechanical engineer: McFall & Konkel; electrical engineer: Swanson-Rink & Associates; landscape architect-planning consultant: Sasaki, Dawson, DeMay Associates, Inc.



Undergraduate Library, University of Illinois, Urbana. Associated architects: Richardson, Severns, Scheeler & Associates, Inc. and Clark, Altay & Associates; campus architect: Paul E. Dixon; structural and drainage engineer: Clark, Dietz, Painter & Associates; mechanical and electrical engineer: Robert Burkhardt & Associates; landscape architect: Robert S. Chamberlin; landscape consultant: Sasaki, Dawson, DeMay Associates, Inc.; contractor: McCarthy-Hathman Construction Company.

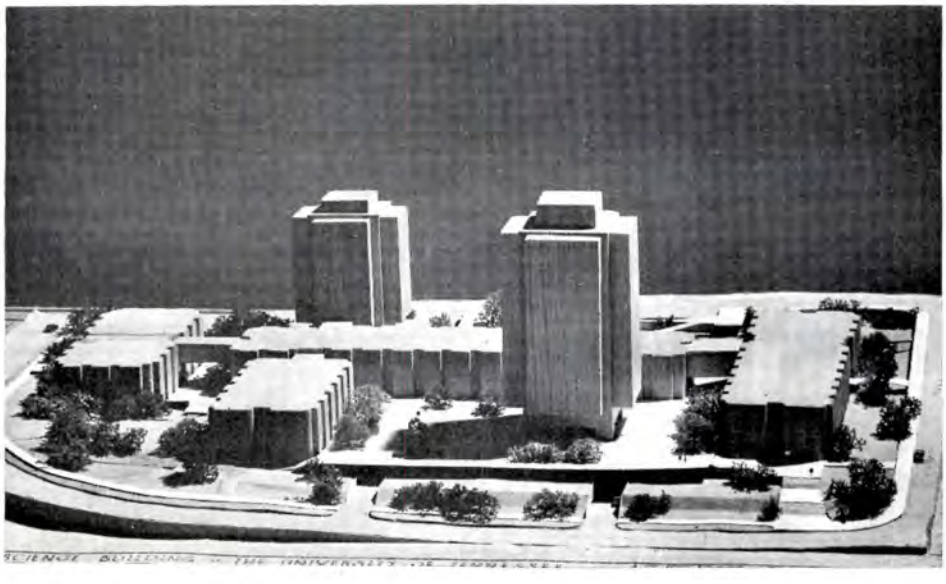
Fine Arts Center, Nazareth College, Rochester, New York. Architects and engineers: Giffels and Rossetti; contractor: John Luther & Sons.

Rondal Partridge

Natural Sciences Building, Unit 1, University of California, Santa Cruz. Architect: Anshen & Allen; structural engineer: T. Y. Lin, Kulka, Yang & Associate; mechanical and electrical engineer: Gayner Engineer; landscape architect: Douglas Baylls; general contractor: Nomellini Construction Company.

Karl H. Riek

Lucie Stern Hall, Mills College, Oakland, California. Architect: Ernest J. Kump Associates; structural engineer: Eric O. Moorehead; mechanical engineer: Yanow and Bauer; electrical engineer: Smith and Garthorne; landscape architect: Eckbo, Dean, Austin and Williams; general contractor; Nelson T. Lewis.



Humanities and Social Sciences Complex, University of Tennessee, Knoxville. Architects: Painter, Weeks & McCarty; structural engineer: Ross Bryan; mechanical engineer: Albert Bedinger; electrical engineer: Fred Breeland; landscape architect: William Oliphant; general contractor: Rentenback Engineering Company.

Tight money impact spreading

The housing market collapse of 1966 may now be spilling over into some nonresidential building areas as well.

During 1966, the nation's housing industry went from one problem to a worse one. Prior to this year, growth in new home building was inhibited by a mildly overbuilt market. Now the big problem is that housing is badly underfinanced, and in the process, housing starts—which had already been in something of a modest decline since as far back as 1963—suddenly dropped by one-third.

This recent housing collapse has been almost entirely a matter of the current scarcity of mortgage money. But while up until a few months ago this problem had been confined to the residential market, there are signs that it's now beginning to spread.

The year started off with a record first quarter as nonresidential building surged and housing was still holding fairly firm. The spring quarter was equally strong in total, but just the same, things were beginning to happen. Housing had already started its slide, but nonresidential building roared on, temporarily taking up the slack. By the third quarter though, the weakness of the housing market had turned into a full scale rout, and by this time a few of the nonresidential building types were also beginning to show signs of strain.

As this more general softening of building activity set in, two things were happening. One was a broadening of the impact of the money problem. It's no longer just the homebuyer's private problem. The money market has tightened up to a point where it's squeezing many types of nonresidential building, too. But there's another depressing force at work, also. Call it the "derived demand" effect.

Several kinds of nonresidential building are normally quite closely related to housing activity. Many of the institutional building types—schools, religious buildings, hospitals—sooner or later are stimulated by an expansion of residential construction. But the really sensitive derived demand relationship is the one that exists between retail stores and one-family housing.

As the table above shows, decline in retail building since the beginning of this year closely corresponds with the drop in housing over the same months.

SEASONALLY-ADJUSTED INDEXES OF BUILDING CONTRACT VALUE

1966 Quarters	(1st Quarter 1966 = 100)	
	One-Family Housing	Stores
1	100	100
2	88	84
3	69	77

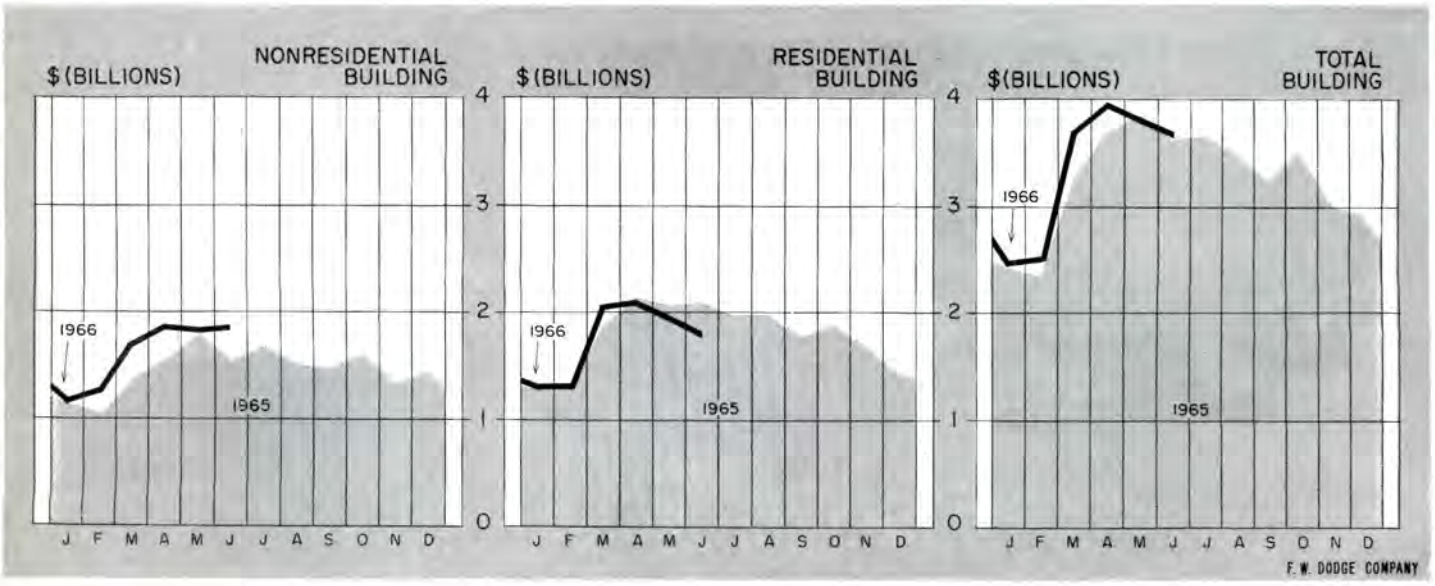
Source: F. W. Dodge Co.

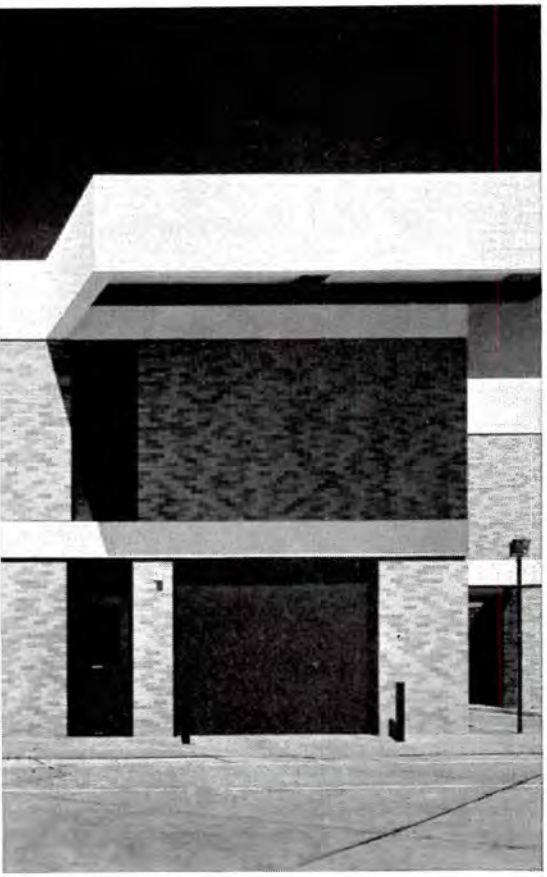
This table offers a current look at a relationship which has held up well over the years. And it's more than just a statistical coincidence. Urban housing—mostly rental—is largely replacement housing and rarely stimulates much new retail building. On the other hand, one of the first requirements of a new *suburban* community is a shopping center. The need for schools, churches, and other facilities normally follows.

Because of these ties, the housing recession could affect a lot of other building activity before it is reversed.

George A. Christie, *Chief Economist*
F. W. Dodge Company,
A Division of McGraw-Hill, Inc.

Building activity: monthly contract tabulations





ARCHITECTS: *Mann & Harrover*
MECHANICAL & ELECTRICAL ENGINEERS: *Allen & Hoshall*
STRUCTURAL ENGINEER: *S. S. Kenworthy & Associates*
INTERIOR DESIGN: *Mann & Harrover*
GENERAL CONTRACTOR: *J. A. Jones Construction Co.*
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BUILDING CONSTRUCTION COSTS

The information presented here indicates trends of building construction costs in 21 leading cities and their suburban areas (within a 25-mile radius). Information is included on past and present costs, and future costs can be projected by analysis of cost trends.

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

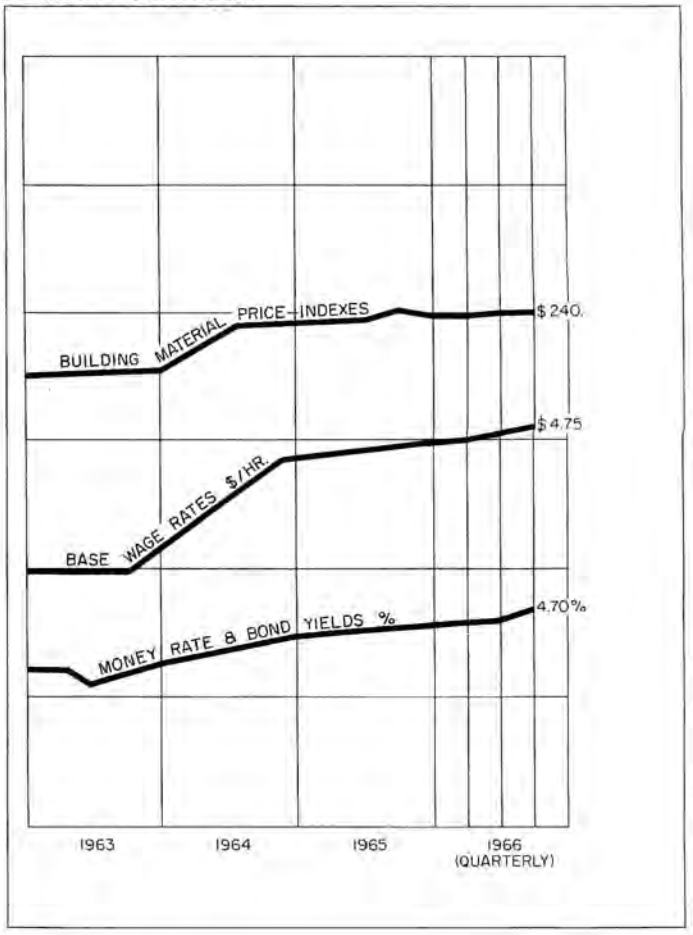
NOVEMBER 1966 BUILDING COST INDEXES

1941 averages for each city = 100.0

Metropolitan area	Cost differential	Current Dow Index residential	Current Dow Index non-res.	% change year ago res. & non-res.
U.S. Average	8.5	277.2	295.3	+2.29
Atlanta	7.2	314.1	333.2	+2.49
Baltimore	7.7	277.8	295.5	+1.89
Birmingham	7.5	254.6	273.8	+1.80
Boston	8.5	250.4	265.0	+1.75
Chicago	8.9	308.2	324.2	+2.80
Cincinnati	8.8	264.8	281.5	+1.57
Cleveland	9.2	286.3	304.3	+2.91
Dallas	7.7	260.2	268.7	+2.34
Denver	8.3	282.6	300.5	+1.29
Detroit	8.9	285.4	299.6	+4.29
Kansas City	8.3	249.5	264.0	+1.91
Los Angeles	8.3	282.3	308.8	+1.92
Miami	8.4	273.4	287.0	+2.34
Minneapolis	8.8	274.8	292.2	+1.54
New Orleans	7.8	247.9	262.7	+1.40
New York	10.0	288.6	310.5	+2.32
Philadelphia	8.7	275.5	289.3	+2.14
Pittsburgh	9.1	258.1	274.3	+1.84
St. Louis	9.1	275.0	291.4	+2.56
San Francisco	8.5	360.0	393.8	+4.61
Seattle	8.4	252.1	281.7	+2.31

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 the first city are 25% higher than costs in the second. Also, costs in the second city are 80% of those in the first (8.0÷10.00=80%) or they are 20% lower in the second city.

ECONOMIC INDICATORS



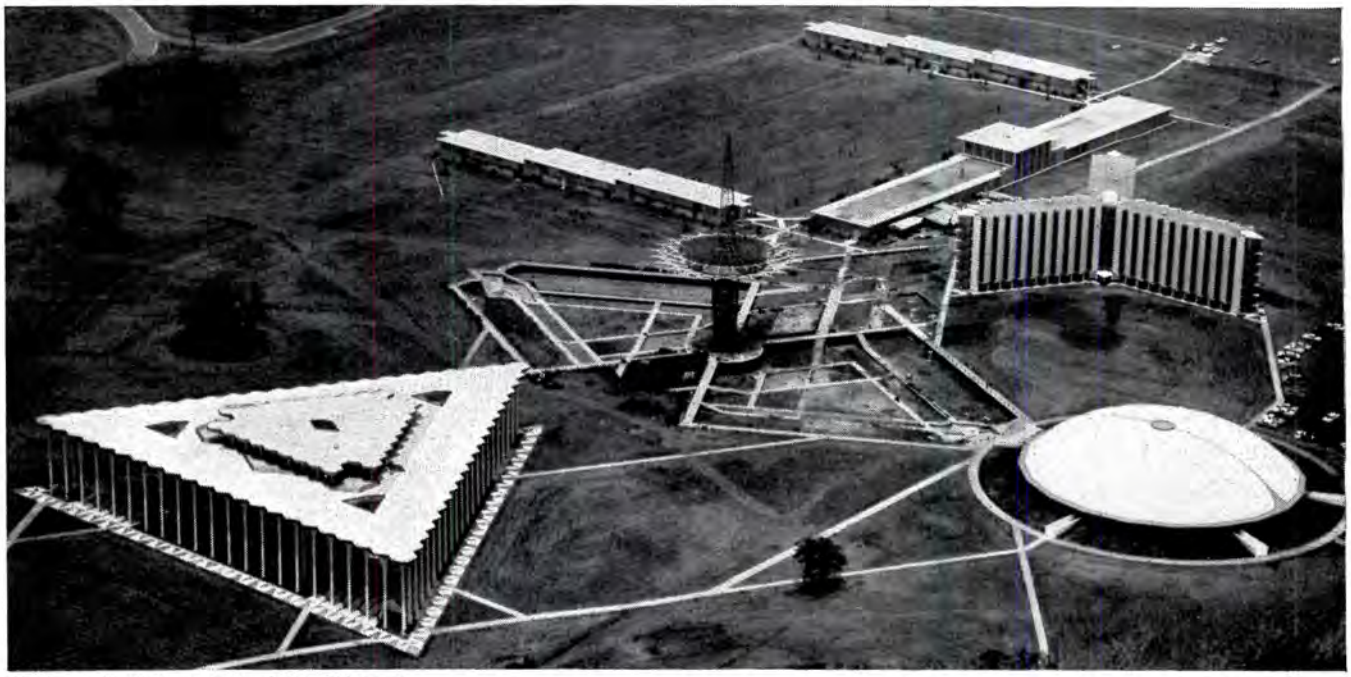
HISTORICAL BUILDING COST INDEXES—AVERAGE OF ALL BUILDING TYPES, 21 CITIES

1941 average for each city = 100.00

Metropolitan area	1952	1959	1960	1961	1962	1963	1964	1965 (Quarterly) 1st	2nd	3rd	4th	1966 (Quarterly) 1st	2nd	3rd	4th
U.S. Average	213.5	255.0	259.2	264.6	266.8	273.4	279.3	279.5	281.0	288.7	284.9	286.3	287.3	290.4	—
Atlanta	223.5	283.3	289.0	294.7	298.2	305.7	313.7	313.9	317.9	320.6	321.5	322.2	323.3	328.5	—
Baltimore	213.3	264.5	272.6	269.9	271.8	275.5	280.6	280.5	281.0	284.7	285.7	288.6	289.6	289.4	—
Birmingham	208.1	233.2	240.2	249.9	250.0	256.3	260.9	261.2	264.1	264.9	265.6	267.1	268.1	269.7	—
Boston	199.0	230.5	232.8	237.5	239.8	244.1	252.1	251.7	252.6	256.3	257.8	258.5	259.6	260.9	—
Chicago	231.2	278.6	284.2	289.9	292.0	301.0	306.6	306.5	307.3	310.2	311.7	312.6	313.7	318.9	—
Cincinnati	207.7	250.0	255.0	257.6	258.8	263.9	269.5	269.4	270.2	272.9	274.0	274.7	275.7	277.2	—
Cleveland	220.7	260.5	263.1	265.7	268.5	275.8	283.0	282.3	283.4	290.8	292.3	293.0	294.1	299.2	—
Dallas	221.9	237.5	239.9	244.7	246.9	253.0	256.4	256.9	257.9	259.5	260.8	261.7	262.6	265.8	—
Denver	211.8	257.9	257.9	270.9	274.9	282.5	287.3	287.3	288.2	292.7	294.0	294.6	295.5	296.6	—
Detroit	197.8	249.4	259.5	264.7	265.9	272.2	277.7	277.7	279.3	283.5	284.7	285.5	286.5	295.7	—
Kansas City	213.3	239.6	237.1	237.1	240.1	247.8	250.5	251.2	252.0	255.0	256.4	257.3	258.2	260.0	—
Los Angeles	210.3	263.5	263.6	274.3	276.3	282.5	288.2	288.9	289.7	295.8	297.1	298.0	298.6	301.6	—
Miami	199.4	249.0	256.5	259.1	260.3	269.3	274.4	274.4	275.4	276.6	277.5	278.4	279.2	282.9	—
Minneapolis	213.5	254.9	260.0	267.9	269.0	275.3	282.4	283.4	283.6	283.9	285.0	285.7	286.6	288.3	—
New Orleans	207.1	237.5	242.3	244.7	245.1	248.3	249.9	250.5	253.1	255.1	256.3	257.1	258.0	258.8	—
New York	207.4	260.2	265.4	270.8	276.0	282.3	289.4	290.2	294.0	296.0	297.1	297.8	298.7	302.8	—
Philadelphia	228.3	262.8	262.8	265.4	265.2	271.2	275.2	275.5	276.4	279.5	280.8	281.7	282.6	285.3	—
Pittsburgh	204.0	241.1	243.5	250.9	251.8	258.2	263.8	264.0	264.9	265.9	267.0	268.9	270.1	270.7	—
St. Louis	213.1	246.9	251.9	256.9	255.4	263.4	272.1	272.9	276.1	279.9	280.9	282.2	283.2	287.0	—
San Francisco	266.4	321.1	327.5	337.4	343.3	352.4	365.4	366.6	366.9	367.7	368.6	376.2	377.7	384.7	—
Seattle	191.8	232.7	237.4	247.0	252.5	260.6	266.6	265.1	266.3	267.8	268.9	271.1	272.1	273.9	—

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

Educational advance:



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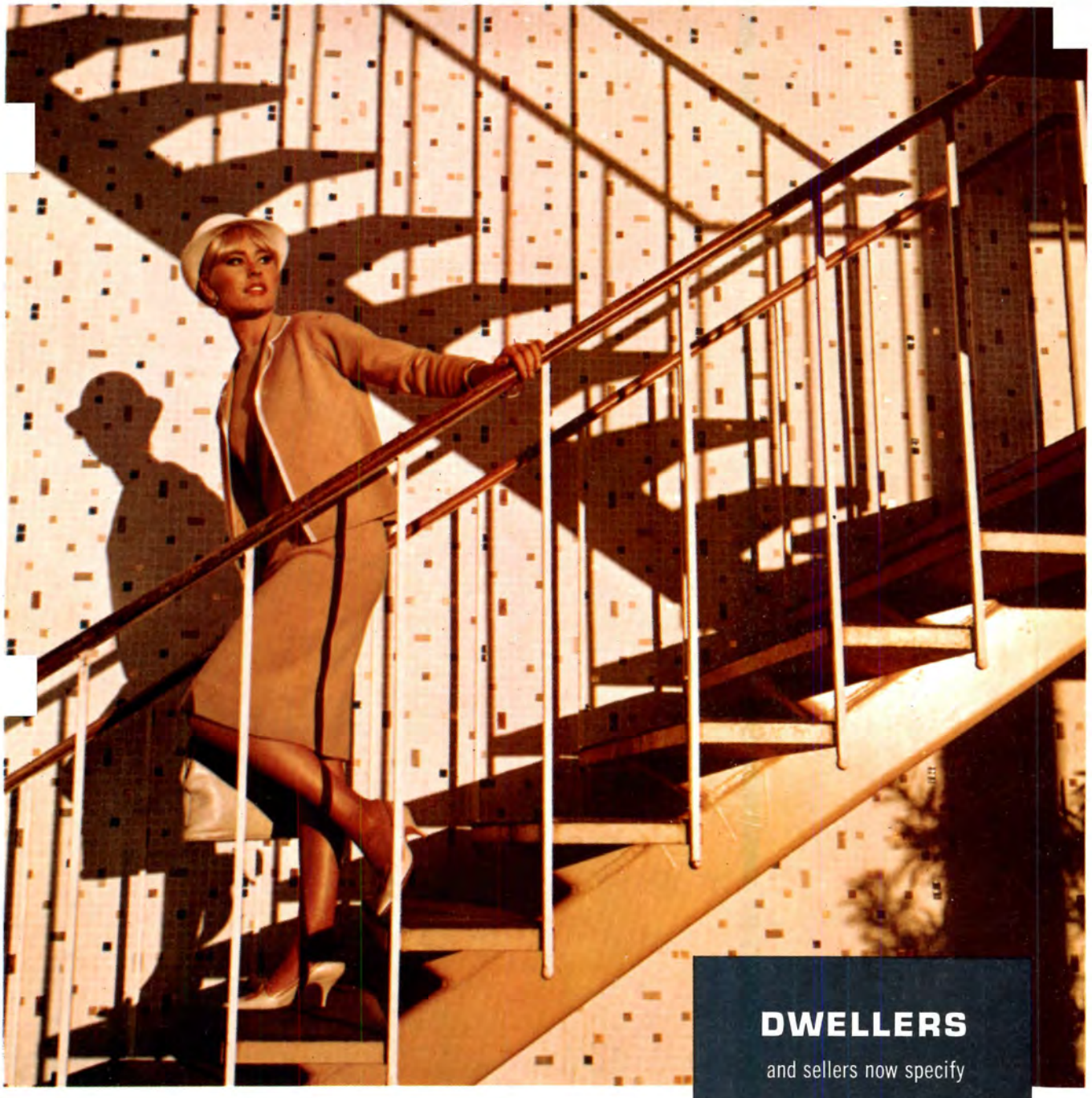

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In the visual tradition of city planning

CAMILLO SITTE AND THE BIRTH OF MODERN CITY PLANNING. *By George R. Collins and Christiane Crasemann Collins. Random House, Inc., 457 Madison Ave., New York, N.Y. 232 pp. illus. Paperbound, $2.95.* CITY PLANNING ACCORDING TO ARTISTIC PRINCIPLES. *By Camillo Sitte. Translated by George R. Collins and Christiane Crasemann Collins. Random House, Inc., 475 Madison Ave., New York, N.Y. 205 pp., illus. Paperbound, $2.95.*

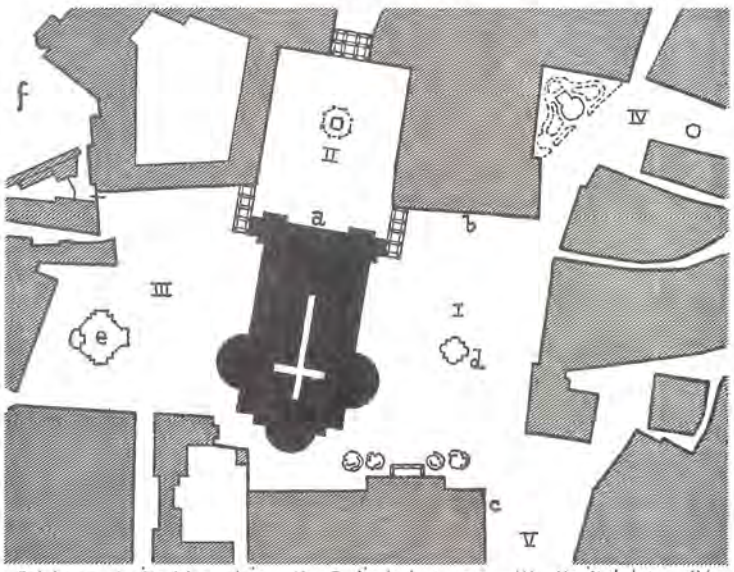
In a prefatory note to *Camillo Sitte and the Birth of Modern City Planning* the authors modestly state the purpose of their book as a companion volume to their new translation of Sitte's *Der Stadtebau* (1889) is to reopen a chapter in the development of modern city planning that has been for years neglected—that of the architectural, city-building tradition. This is indeed a welcomed undertaking and one is hopeful that it may somehow have far-reaching effects. At the present time even the term "city" has lost negotiable meaning in the sense it carried *circa* 1900 when Sitte's book achieved popularity. Architecture today is discussed by some serious people as a "throw-away-item" and cities themselves no longer enjoy the same kind of physical definition which once gave them their uniqueness. And what is particularly disquieting is the apparent lack of vision by architects of what role architecture should have in city-building as is made evident by the character of proposals for the city of the future—what we are urged to consider if we are to survive—schemes which in no way suggest a better way of life nor are expressive of cultural continuity through architecture in terms one can comprehend.

Sitte's book on city planning was published at a time when major European cities were undergoing accelerated expansion. Vienna was Sitte's point of contact with the many problems accompanying growth at that date. For example, the Collinses point out that it was a period of obsession with traffic and all obstacles to its flow were being removed. The invention of the steam engine in the early part of the century provided a means of rapid mass transportation at an entirely new scale and the city had to change to accommodate it. And a major planning concern of the century was whether or not to introduce a central railroad station into the nucleus of the city or whether to leave the terminals on the outskirts with the train yards.

Also it was a period of obsession with public health. Increased knowledge about the nature of contagious diseases and epidemics introduced a new awareness of the necessity for superior standards of sanitation in physical planning. The period also gave birth to the modern zoning law—"a necessary device to maintain some sense of order and to protect the general public in a period of uncontrolled growth and unbridled land speculation." However, we are told that in the midst of all these changes, some thoughtful architects and planners such as Sitte were very much concerned with the preservation of historic buildings and of the character of existing quarters. There arose protagonists of the "straight" or "crooked" street, of the "hygenic" or of the "picturesque" as coined visions of visual perfection in planning formulations. But the period also produced the fathers of modern city planning thought and in *Camillo Sitte and the Birth of Modern City Planning* we are given a synopsis of their work in Germany and Austria. The book also contains the critical and explanatory notes to the companion volume of Sitte's own writings.

In his introduction to *City Planning According to Artistic Principles* Sitte notes the purpose of his work: to analyze ancient and modern cities in a purely artistic and technical manner so as to discover their compositional elements which can lead on the one hand to harmony and enchantment or to disunity and dullness on the other. All this, he says, aims at finding if possible an escape from the modern apartment-house block system in order to save wherever practical the beautiful old parts of town from falling prey to continuing demolition, and in the end to

continued on page 72



Salzburg. I. Residenzplatz.—II. Cathedral square.—III. Kapitelplatz.—IV. Former market place.—V. Mozartplatz.—a. Cathedral.—b. Residence.—c. Government house.—d. Fountain.—e. Watering-place.—f. St. Peter's

"Typically Italian and, in fact, the work of Italian masters (Scamozzi, Solari, etc.) is the magnificent grouping of plazas around the Cathedral of Salzburg. Here, as rarely north of the Alps, the motif of the colonnade (in this case a double arcade to the right and left of the Cathedral facade), has been employed to make the intended effect possible. The purpose of the builders was unmistakably to create a complex of closed plazas. To accomplish this it was first necessary to enclose the Cathedral square (II) with the colonnades, actually covered passageways. These answer their purpose admirably. . . ."

From CITY PLANNING ACCORDING TO ARTISTIC PRINCIPLES

THIS MONTH'S BOOKS

REVIEWS

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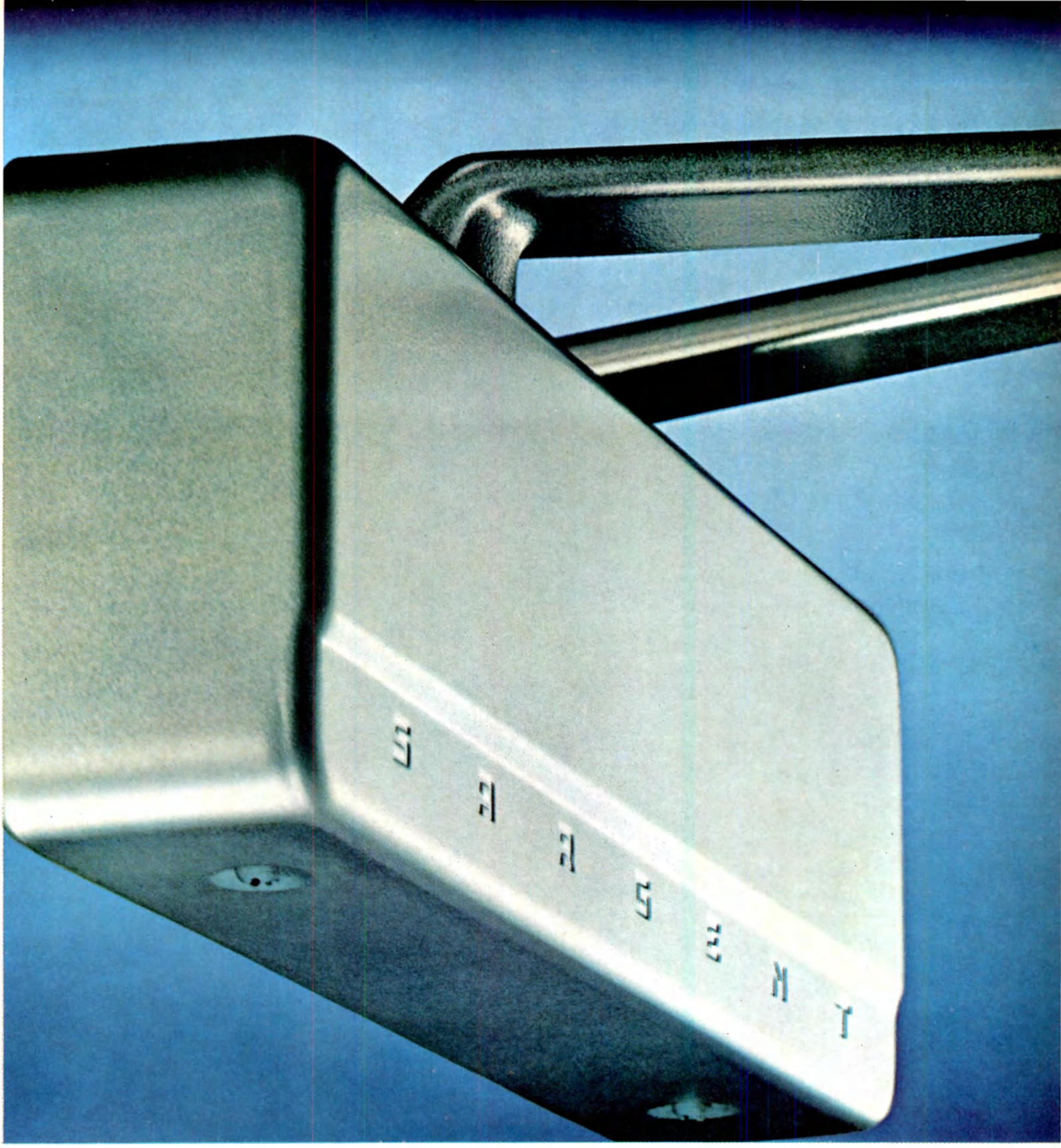

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continued from page 68

bring forth something in the spirit of the old masterpieces.

Then he divides his book into a number of chapters wherein illustrated discussions are given to such topics as "the relationship between buildings, monuments, and their plazas . . . the meager and unimaginative character of modern city plans . . . artistic limitations of modern city planning."

Although Sitte is probably best remembered for the kinds of information he compiled and illustrated in these discussions, it is not especially from this knowledge that he emerges as an interesting figure. But it is from his general insistence that the city was a work of architecture to be conceived of three-dimensionally that we find him sympathetic. As the translators of *Der Stadtebau* concluded, "had it not been demonstrated that the towns of old had grown by slow steps, without plans perhaps, but under the supervision of an uncanny spatial sense on the part of successive generations of builders? Sitte, singlehandedly, had given city planning back to the architects." This was *circa* 1900.

Raymond Lifchez

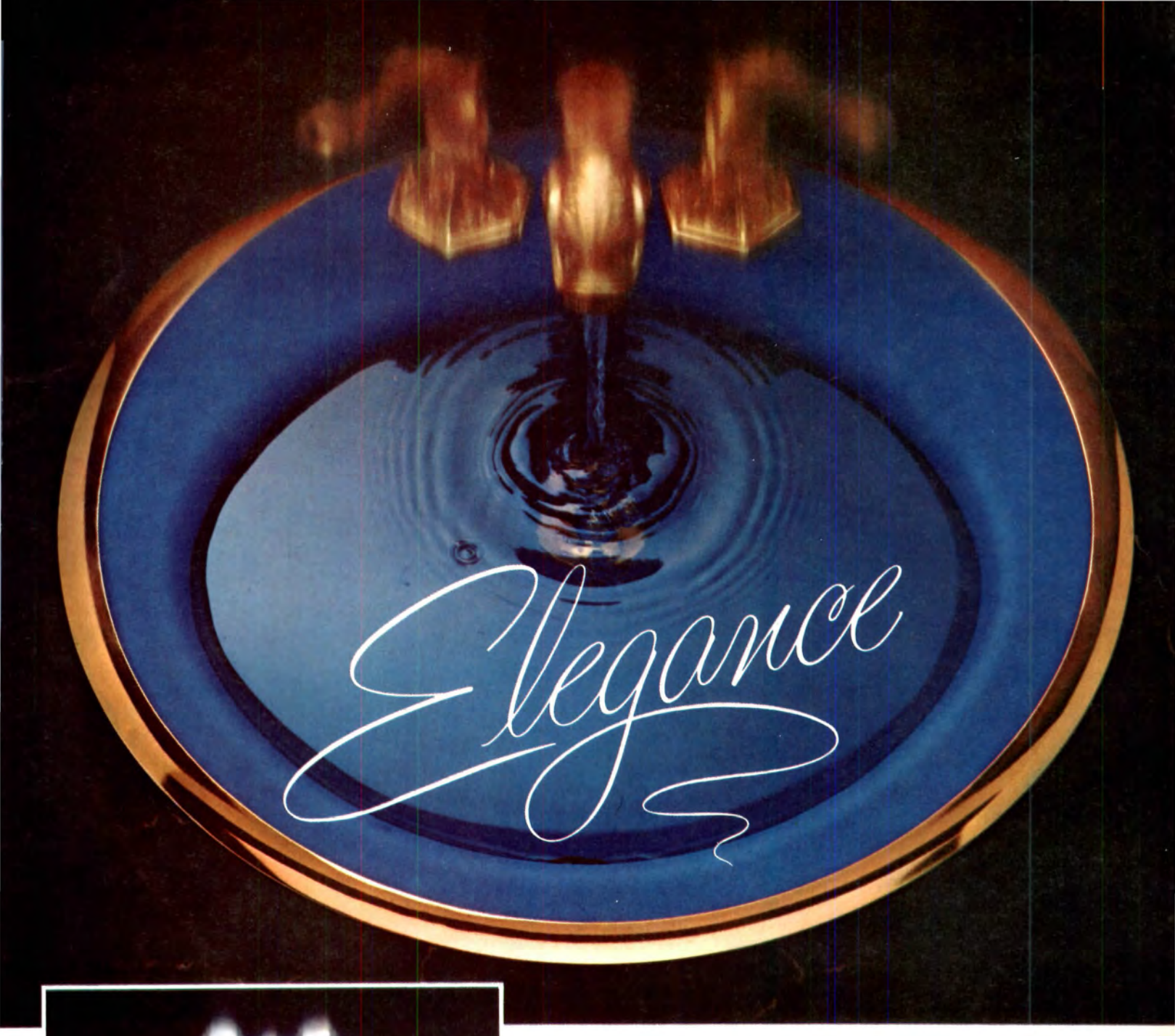
Gaudi

GAUDI'S PARK GUELL. *By C. Giedion-Welcker. Wittenborn and Company, American distributors, 1018 Madison Avenue, New York, N.Y. 10021. 64 pp., illus. $15.00.*

Gaudi is an extremely visual and sensual architect and it is very difficult to deal with his *oeuvres* in words or two-dimensional media. This book attempts through the means of a "visual essay" to convey the experience of walking through the Park Guell. The only text is a short 12-page essay appearing in four languages—Spanish, French, German and English. The author confines his comments primarily to the "exuberant artistic personality" and unusual techniques of Gaudi.

The photographs seem magnificent and the color unusually true, but when the diligent reader studies them more intently and tries to recreate for himself a visit to Park Guell, he becomes quite frustrated. The sequence of the photographs is confusing and the plan provided in the back inadequate. To add to the confusion, Roman numerals are used on the photographs and Arabic numbers on the plan which immediately puts the viewer in the awkward position of translating from one notation to the other, detracting from the good intentions of such a

continued on page 78



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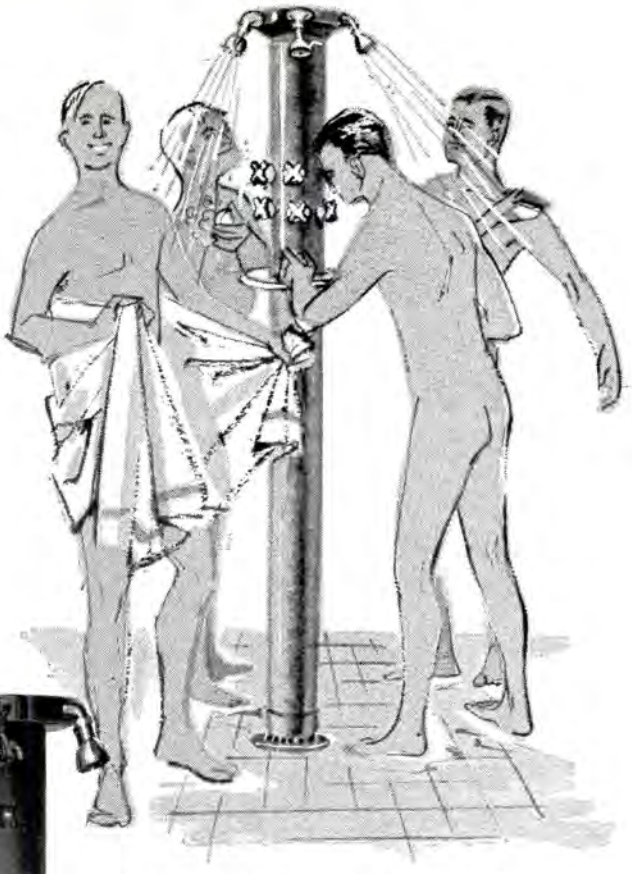

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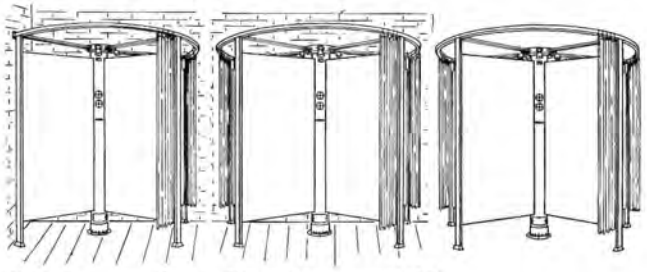

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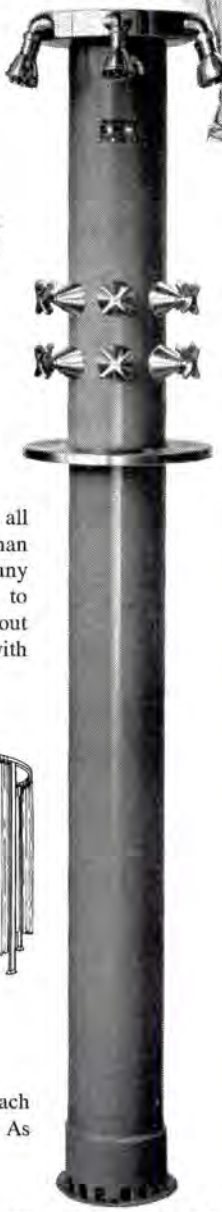

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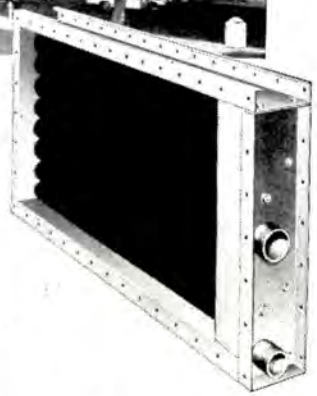

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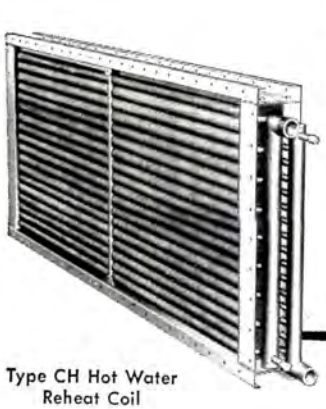

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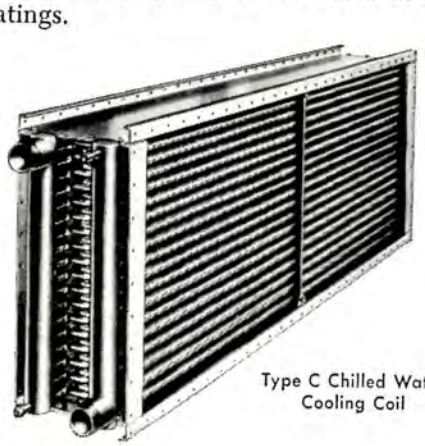
Reheat Coil



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The Terry Steam Turbine Co. plant at Windsor, Conn., showing the attractive effect of color in the Mahon 66 panels.

Architects: Buck and Buck, Hartford, Conn.

continued from page 72

labeling system. Unfortunately the plan simply is not large enough to be of value and one would assume that a person interested in Gaudi would also be interested in a more detailed explanation of the planning in the Park; for example, one cannot easily tell by looking at the plan where the famous curvilinear benches are located.

In our age of drastically improved printing processes there is a tendency toward infatuation with the possibilities of graphic format and the old traditional methods of communication tend to be forgotten. Not all photographs, no matter how good, compose well when cropped into a square. The format of the book is too rigid, and the lack of margins around the illustrations is confusing. The juxtaposition of photographs, meeting in the gutter, causes them to be read as two-page spreads rather than separate views. Margins would serve a dual function, providing a means of separation and also space for explanations and key-numbers, which had to be eliminated altogether on the color plates.

Despite deficiencies in format, this book gives Gaudi admirers a substantial collection of clear and sometimes dramatic photographs of the diverse colors and materials used in his work. The illustrations of the tile "collages" and robust stone work are exciting and unusual. The book is a valuable pictorial document of the Park and as such, worthy of recommendation to those who are fascinated by the works produced by the highly imaginative mind of Gaudi.

Linda Mullestein

BOOKS RECEIVED

THE AMERICAN COLORIST, *A Practical Guide to Color Harmony and Color Identification. By Faber Birren. Silvermine Publishers Inc., Comstock Hill, Norwalk, Conn. 06850. Chart form, $1.50.*

THE EVERYDAY PLEASURES OF SCULPTURE. *By Maria M. and Louis di Valentin. James H. Heineman, Inc., 60 East 42nd St., New York, N.Y. 10017. 128 pp., illus. $8.50.*

ZUGBEANSPRUCHTE KONSTRUKTIONEN. *By Otto Frei. Wittenborn and Company, American distributors, 1018 Madison Ave., New York, N.Y. 10021. 171 pp., illus. $25.00.*

A SOCIAL HISTORY OF FURNITURE DESIGN FROM B.C. 1300 TO A.D. 1960. *By John Gloag. Crown Publishers, Inc., 419 Park Avenue South, New York, N.Y. 10016. 202 pp., illus. $12.50.*

MANAGING OUR URBAN ENVIRONMENT: CASES, TEXT AND PROBLEMS. *By Daniel R. Mandelker. The Bobbs-Merrill Company, Inc., 3 West 57th St., New York, N.Y. 1003 pp. $15.00.*

COST ESTIMATING AND CONTRACT PRICING. *By Thomas F. McNeill and Donald S. Clark. American Elsevier Publishing Company, Inc., 52 Vanderbilt Avenue, New York, N.Y. 10017. 514 pp., illus. $15.00.*

associated practice:

ground rules and variations

The association of two or more architectural firms in a formal agreement for the execution of a commission offers many advantages in the complex, frequently long-distance operations required of today's expanding architectural profession. But it can also introduce complications and frictions. The ground rules listed below were developed in an interview with Richard Roth Sr., a partner in Emery Roth & Sons, a firm with long experience and notable successes in associated practice.

The most important condition: complete mutual respect

Although one firm or the other may have primary responsibility in, say, design or production phases of the job, each firm must feel that the other is qualified to criticize or make suggestions on any phase of the work. Actually, association between two firms is not very different from the kind of association that occurs internally in any large architectural office staff, and the criteria for success are much the same. If one office is assigned only the design work, it must nonetheless be vitally concerned with the execution, if the finished building is to be attractive and also within the client's budget. It is important, too, that the association between two firms should be voluntary—where the client insists upon a particular association, there is always the possibility of resultant friction or misunderstanding.

Different kinds of association: effective teamwork vs. shotgun marriage

Mr. Roth describes nine variations of the associated arrangement, some of which reflect differences in motivation, while others describe differences in the actual working relationship itself:

- Where a large job introduces building types which are unfamiliar to a firm—for example, a large shopping center with one or more theaters—a firm may suggest to the client that an association with a firm specializing in theater design might be an advantage.
- A public agency may insist upon association for various policy reasons, and a kind of shotgun marriage may result.
- A firm of moderate capacity may have a client who suggests association with a larger firm.
- The prime architect may elect to associate for reasons of his own.
- The type and size of job may warrant association for reasons of work load and diversification of talent to be applied.
- On out-of-town jobs, the client may want a local man associated with his project, even though the local architect may not be equipped to handle the whole job.
- The major tenant of a proposed commercial building may insist upon involving its own architect in the project. This makes for a loosely defined relationship with the owner's architect.
- Where an associated architect merely supervises construction, the association may also be a loose one in which the associated architect has a separate contract with the client.
- An association may be formed to demonstrate combined capability to a client at the presentation stage of the project.

The mechanics of association: fees and arrangements

Fees for associated work must be slightly higher than for non-associated jobs, since there is an inevitable loss of time when two firms are involved. The client must understand this and be willing to accept the premium fee in exchange for the inherent advantages of the associated firms' resources.

Every association should have a formal agreement, which spells out in detail the scope of each firm's work and responsibilities and the division of the fee. If one of the firms is responsible for engineering consultation, the fee is adjusted accordingly. In the case of the association for the building of the World Trade Center, for example, the basic agreements are with the Port of New York Authority (the client) but associated architects and consultants have all signed an agreement to work together.

An associated architect may have engineering or local talent available to deal with specific problems, but in every case communication—particularly between architect and engineer—is of vital importance to the work.

Experience in the Roth office

About one in every five jobs currently going through the Roth office is done in association with other firms. The circumstances of each new association have proved to some extent unique, and have added something to the experience of the office as a whole, Roth reports.

A notable association in which the Roth organization was deeply involved was the Pan Am building in New York. There was reason to believe that any building of such a size and in such a location would inevitably be controversial in character, and further, Roth felt that many minds should be brought to bear on so prominent a building. The Roths decided to invite the participation of the best minds in the country. Pietro Belluschi and Walter Gropius both accepted the challenge of this controversial commission, and their work with the Roth organization is now history.

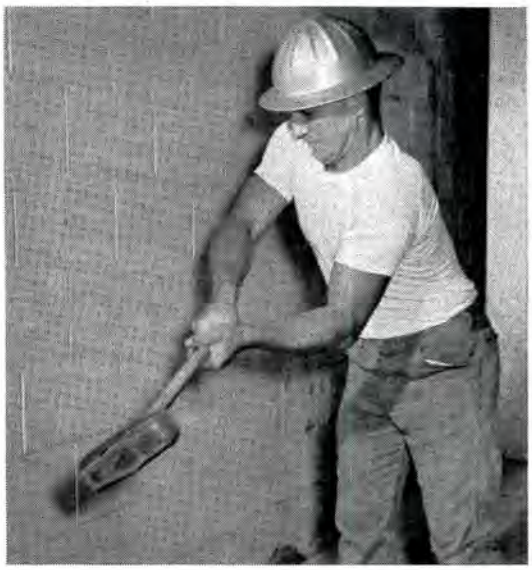
At present, the Roth organization is engaged on another exciting and no less controversial association with Yamasaki for the development of the new World Trade Center for the Port of New York Authority. In this case, the Authority approached both Roth and Yamasaki independently with the suggestion of association, and each firm selected the other. One of the chief reasons for association was the vast size of the job, which could have tied up the complete resources of any one office. Association in this case permits each firm to handle its load efficiently without risking the economic dangers of total commitment of its entire staff to one huge project.

Unlike many architectural offices, the Roth organization does not assign particular jobs to an exclusive job captain. Instead it operates on the principle of guidance and supervision of each job by the top people in the firm. The associated arrangement therefore works out very well for this type of internal office organization, since each firm can supervise its own phase of the work without the serious dislocation and problem of excessive supervision which would result if the firm had to add several hundred extra personnel to handle a given assignment on its own.

Mr. Roth has found from his extensive experience in associated practice that each office learns something as a result of working closely with another firm. The exchange of knowledge and experience, if handled sympathetically, ultimately makes for a stronger profession. Ideally, all architects should practice in the utmost depth of their capability, but it takes time to acquire knowledge. Mr. Roth felt that association is one means of accelerating the learning process, and of deepening the experience of architectural practice.

see "Interstate Practice," page 104

22 months ago the architect thought this was the most modern cooler and freezer ıe could specify... now they're ripping ɔut walls to provide for today's extra needs



All this trouble and expense could have been avoided had the original plan included a Bally prefabricated Walk-In Cooler and Freezer. Bally Walk-Ins can be specified in sizes large enough for present and near-future needs. But when the food operation requires more cooling or freezing area, Bally's sectional construction permits easy panel-by-panel expansion. No need ever outgrows Bally's capacity to expand. And if future needs dictate relocation of a Bally Walk-In, no major building alteration is necessary. It's easy to disassemble the Bally Walk-In and reassemble it, section-by-section, at the new location. □ Mass-produced Bally Walk-In Coolers and Freezers offer all the features most wanted by everyone in the food serving business. They can be assembled in any size or shape from standard modular sections. Users have a choice of galvanized steel, aluminum, or stainless steel skins which encase a 4″ wall of fire-retardant "foamed-in-place" urethane. Has double the value of conventional insulation (4″ equals 8½″ of fiberglass). Urethane is a 97% closed cell material and cannot absorb moisture, ever. □ Bally's "foamed-in-place" technique develops panels with great structural strength that do not require wood members and 100% of every panel is insulation. Built-in patented Speed-Loks make section joining fast, accurate and easy. Cubic-foot cost of Bally Walk-Ins is substantially lower than that of "built-ins" or "reach-ins". □ Write for Architect's Fact File with 32-page brochure, specification guide, and sample of Bally urethane wall. Ask about the Bally engineering program that provides specific refrigeration, capacity and construction information that is of great assistance in layout and specifying.

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interstate practice:

legal and accounting *problems*

When an architectural office contemplates extending its practice to another state, it is important to remember that the various territories and states have enacted over 50 different statutes regarding qualifications and registration for the practice of architecture. There are wide variations in the provisions of these statutes—and particularly in their application to practice by architects from other states. There is much variety in detail and little reason for some of the differences. Thus it is difficult to generalize—and easy to trip up.

This was the caution urged by Samuel Spencer of Spencer & Whalen, legal counsel to the A.I.A., in a talk before a practice workshop at the 1966 A.I.A. convention in Denver.

"If there is one thought I would like to leave with you," Spencer said, "it is that when you or your firm are considering undertaking a commission or opening a branch office in a state or territory where you have not practiced previously, you should consult your attorney to be sure that you take the necessary steps so that you will not be practicing illegally in the new jurisdiction." What follows is extracted from Mr. Spencer's remarks, supplemented by the table, opposite.

When architects are contemplating opening a branch office, there are—in addition to legal problems—a number of accounting and tax matters on which they will probably need the advice of an accountant working in conjunction with their attorney. The lack of uniformity of the law frequently makes what should be a fairly simple matter into a complicated and cumbersome one. The practicing architect must comply with these laws and regulations, or he may find that he is guilty of a crime or cannot collect his fee.

Here are some examples of the kind of problems which you may run into in extending your practice to other jurisdictions. There are two basic situations: (1) where you or your firm want to handle a single commission in another jurisdiction; and (2) where you want to open a branch office and practice in the new jurisdiction on a continuing basis. Further, it makes a difference whether a single architect, a partnership, or a corporation is involved.

Proprietorships

If you are a single architect practicing as an individual proprietorship and wish to undertake a commission outside the state where you have your office, there are ordinarily two ways that you can do it: (1) you can become registered in the jurisdiction where the building will be constructed; or (2) you can associate a local architect or firm with you in the project. It may be that you will want to do both. It should also be remembered that in some jurisdictions, such as the District of Columbia, some public work is exempted from the registration requirement.

Most states now recognize an NCARB certificate and will register an architect who holds one without his having to take extensive examinations. Thus it is clearly to your advantage to have an NCARB registration. However, even with such a certificate there may be considerable delay in registration being issued.

Because of this time lag and for other reasons, it may be necessary for you to associate a local architect or firm with you. This practice has been widely used throughout the country and has been broadly accepted for a great many years, even though in many cases the local architect has almost nothing to do with the design and even during the construction phase may have little responsibility for the work.

In spite of the widespread nature of this practice, a word of caution is in order: Many architectural registration acts provide that no one who is not registered in the State shall engage in the practice of architecture. The practice of architecture is often defined substantially as rendering or offering to render services by consultation, preliminary studies, drawings, specifications or any other service in connection with the design of a building or alteration or addition thereto. Where an architect with his office in state A enters into a contract with an owner in state B to design a building to be constructed in state B; has various conferences in state B with the owner; draws the plans and administers the construction contract in state B; it is entirely possible that a court would hold that he was practicing architecture in state B even though he had gone through the form of associating a local architect with him and adding his name to the plans submitted to the building permit office.

Fortunately, such matters are not very frequently litigated, and there has been a reluctance by prosecuting authorities to bring criminal charges against professional men for failure to comply with registration acts—except in very flagrant cases. However, there is always the possibility of a criminal prosecution, and this issue may easily arise if the architect gets into a dispute with his client over his fee. It is a well established rule of law that if an architect is practicing illegally, he cannot collect his fee. Thus, you should be quite careful in the manner in which you associate a local architect with you and how much you have him do, in order to be sure that you are complying with the registration act of the particular state involved. In a few states, such as Kentucky, you can only be a consultant to the local architect, who must make the contract with the client.

If you, as an individual proprietor of your own firm, wish to open a branch office in another state, it would ordinarily be essential for you to be registered in the state before you do so. Further, some states have an annual professional license fee which must be paid by anyone engaging in certain professions. In Alabama, for example, there is a rule of the State Board for the Registration of Architects that no firm or individual may establish an office or branch office to engage in the practice of architecture unless it is under the "immediate day-to-day control and direction" of an architect duly registered in the state "who is a bona fide resident of the immediate area in which such office or branch office is located and whose sole place of business shall be such office and whose sole responsibility shall be the management of such office or branch office".

Partnerships

If a partnership is extending its practice to another jurisdiction for a single commission, there is a question of whether one or more of the partners should obtain registration in the new jurisdiction and whether and to what extent it should associate a local architect with it. With regard to the association of a local architect or firm, the same questions arise regarding the extent to which the registration law of the state requires the local firm to participate and assume responsibility. This necessitates a careful examination of the state registration law and a division of work and responsibility between your firm and the local firm to meet the requirements of the law. There are not many decided cases on these

VARIATIONS IN STATE LAWS ABOUT ARCHITECTURAL PRACTICE BY CORPORATIONS

The following is a synopsis of classifications which were worked out by legal counsel for the A.I.A. early in 1964, on the basis of the best information then available concerning the practice of architecture in corporate form in 53 jurisdictions. The information was compiled by making an independent study of the registration laws collected by the National Architectural Accrediting Board, and by utilizing a survey made through written questionnaires answered by representatives of nearly all of the state A.I.A. organizations. This classification is believed to be generally accurate, but it is *not* based upon a sufficient inquiry to justify anyone concluding, for example, that it is certainly lawful rather than unlawful to practice in corporate form in a given jurisdiction. It is of course possible that some changes in the law may have occurred since this study was made. The problem of classification is very difficult because it depends not only upon the statutory provisions, but also upon interpretations and applications made by the registration boards and by the legal officers of the states. Necessarily, this classification was based in some jurisdictions on inferences to be drawn from the statutory language. There are, therefore, many gray areas, and consequently the following lists must be understood to contain a certain possibility of error. It is not meant by this to indicate that there is uncertainty in every jurisdiction. The questions are definitely settled in one form or another in at least 50 per cent of jurisdictions.

Corporate practice prohibited:

- Alaska
- Connecticut (except for 1933 grandfather clause)
- Maryland
- Mississippi
- New York (except for 1929 grandfather clause)
- Oregon
- Pennsylvania
- Virginia
- Washington
- District of Columbia

Corporate practice probably prohibited:

- Kansas
- New Hampshire
- New Jersey
- Ohio

Corporate practice authorized but subject to limitations concerning stockholders, directors, or responsible employees or other persons:

- Alabama
- Arizona
- Arkansas
- Delaware
- Florida
- Georgia
- Hawaii
- Illinois
- Indiana
- Louisiana
- Massachusetts (subject to distinction based on a 1957 grandfather clause as to method of organization)
- Michigan
- Minnesota
- Missouri
- Nebraska
- New Mexico
- South Carolina
- South Dakota
- Tennessee
- Vermont
- Wisconsin
- Oklahoma (There are in fact about eight corporations in Oklahoma.)
- Texas

Corporate practice prohibited as such but corporate relationships authorized as long as a responsible registered person does the work:

- Connecticut (with respect to the three corporations which are within the 1933 grandfather clause)
- Iowa
- Maine
- Massachusetts (with respect to corporations formed since 1957)
- New York (with respect to the 119 corporations which are under the 1929 grandfather clause)
- North Dakota
- Canal Zone

Probably to be classified in one of the two foregoing categories which permit corporate practice in restricted form are:

- Colorado
- Idaho
- Kentucky
- Montana
- North Carolina
- Rhode Island
- Utah
- Wyoming

States specifically authorizing architects to form associations under a professional associations act:

- Alabama
- Georgia
- Illinois
- Nevada
- Ohio
- Pennsylvania
- South Carolina
- Tennessee
- Virginia
- (and possibly Connecticut)

States having narrow, very specific professional corporation acts which appear to authorize architects to practice in corporate form:

- Missouri
- Montana
- Oklahoma
- Utah

It should be remembered that a general principle of legislative interpretation is that the latest expression of the legislature controls. Consequently, it becomes a question of state statutory interpretation and state constitutional law as to whether the provisions of these professional corporation acts override the prohibition still expressed or implied in registration acts.

States having broad professional corporation acts which on their face include architects:

- Arizona
- Arkansas
- Florida
- Idaho
- Kentucky
- Michigan
- Nevada
- New Jersey
- New Mexico
- North Dakota
- Vermont
- Wisconsin

It is impossible from this classification to determine whether the architectural registration laws in these states prohibit corporate practice despite the breadth of the applicable law.

Uncertain as to the present law:

- West Virginia (where one corporation was reported as actually existing)
- Puerto Rico

matters, and frequently your attorney will be somewhat in the dark when endeavoring to advise you about what is permissible and what is not.

Frequently, architects are under the impression that if they associate a local architect with them for a small fee so that his name can go on the drawings there is little else the local architect need do. The originating, out-of-state firm does all the work and takes all the responsibility. No doubt this has been done many times by reputable architects and no trouble has resulted. There is, however, always the possibility that if a controversy arises over the architect's fee and he is forced to litigate, the owner may claim that he is practicing illegally and is therefore not entitled to his fee.

There are some states, such as Ohio, where a partnership may not practice in the state unless all the partners are registered. This may not be practical where only a single commission is involved. In such cases it may be necessary for the partner who does become registered to make the contract with the client individually rather than in the name of the firm.

When a partnership is opening a branch office in another jurisdiction, one of the first things to check is whether the state requires all partners of a partnership practicing within its borders to be registered. If it does and if it is practical for all the partners to be registered in the state, that is one solution. In some cases, however, this may not be practical. It may then be necessary to set up another partnership to operate in the new jurisdiction, having as its partners only those who are registered in the new jurisdiction. In such cases the new partnership should maintain a distinct identity.

Contracts with clients in the new state should be executed in the name of the new partnership and carried out by its personnel. Partners should be careful not to hold the main partnership out in the new state as practicing architecture there. This involves not placing its name

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on the door, in telephone directories, on signs and on stationery used in the state, or doing anything which would indicate that the main partnership is practicing architecture in the state.

You should also be careful regarding the name which the new partnership uses in the state. Some states, such as New York, prohibit the use of assumed or fictitious names. Others, like the District of Columbia, permit only the names of persons who are registered in the District to be used in the name; it has been ruled that it is a violation for an architect registered in the District, who is associated with others who are not registered, to use the words "and associates" after his name. Some states prohibit the use of a deceased person's name.

It may be that where the intention is to have one resident architect who is locally registered run the branch office, he will have to do so in his own name, signing contracts, etc., in his own name and indicating, if local regulations permit, that he is associated with the firm in the other state. These legal requirements are necessarily reflected in the arrangements of the local man with the main partnership regarding the handling of his compensation and his responsibility for actions of the firm in the other jurisdiction. Sometimes, rather than being a full partner, it may be preferable for him to be considered as a consultant of the main partnership and compensated as such.

Again it should be emphasized that in all these situations a firm is wise to consult legal and accounting counsel who can tailor the organizational and contractual arrangements to comply with the applicable statutes and to meet the desires of the professional men involved in the venture.

Corporations

The problems arising with respect to an architectural corporation extending its practice to other jurisdictions are more complicated and troublesome than for either a proprietorship or a partnership.

The problems arise primarily from the varying treatment of architectural corporations by the different jurisdictions. Nine states and the District of Columbia appear to prohibit corporate practice entirely. In several others corporate practice is probably prohibited although the matter is not entirely clear from the statutes, regulations and decided cases. Some jurisdictions prohibit registration of corporations but permit architects to organize into corporations as long as a responsible official of the corporation is registered and is responsible for the work. A number of jurisdictions prohibit registration of corporations but authorize corporate practice subject to various limitations regarding who may be stockholders, directors, officers, etc.

This widely varying approach toward the corporate form of organization for architectural practice has been caused by a number of factors. One is the concept that professional service is essentially a personal service which must be rendered by an individual and which must have individual liability and responsibility behind it. For example, in the great majority of states, lawyers are not permitted to organize in corporate form for the practice of law. Working in the opposite direction is a line of thought that professional people should have the same advantages regarding pensions, profit sharing plans, and the like, as business people, and that therefore they should be able to organize into corporations or associations treated for tax purposes as corporations. These conflicting lines of thought, and considerations, have had varying impact on state legislatures producing the present diversity of law.

The most acute problems occur when a corporation, organized in a state like Massachusetts, which permits corporate practice, wishes to extend its practice to a jurisdiction such as New York, which prohibits corporate practice. In New York, the corporation as such cannot contract with the client to provide architectural services. The contract must be executed by one or more individual architects who are officers or directors of the Massachusetts corporation. It may be necessary to set up a separate proprietorship or a partnership of certain of the corporate officers and directors to practice in New York. This proprietorship may have to assign its fees to the corporation. It may not be possible for it to practice in the corporate name because of a New York law which prohibits anyone from practicing under an assumed or fictitious name.

There are many complications with respect to accounting, allocation of costs, and federal and state tax liabilities. Questions also arise regarding who is the employer of employees in the New York branch office. Can such employees participate in the pension and profit sharing plans of the Massachusetts corporation, or must they be considered in all respects employees of the New York proprietorship or partnership?

You can readily see that this situation raises many practical problems of how to set up and run the branch office which can only be solved in each case with the help of an attorney and an accountant and after a careful examination of the applicable laws.

Suggestions by another attorney on reform of state licensing laws

"Enlightened reform" of state licensing laws was called for by Carl M. Sapers, member of the Boston law firm of Hill, Barlow, Goodale and Adams, at an invited attorneys' meeting sponsored by the A.I.A. in Washington last year. Mr. Sapers said that more and more obstacles were being put in the way of free exchange of architectural service across the nation, and that this tended to limit the architectural potential of individual states and discourage a unified national approach to architectural problems. He thought that the profession might make a significant stride forward if it sponsored legislation in all states that restrict firm practice within their boundaries.

Mr. Sapers suggested that the following terminology in legislation might cover the main requirements:

"Nothing in this chapter shall prevent an architectural firm, association, partnership or corporation, not having an established place of business in this state, from practicing architecture, provided such architectural firm, association, partnership or corporation is qualified to practice architecture in its own state and provided further that all professional service be under the personal direction of a principal, partner or officer, as the case may be, licensed to practice architecture in this state."

Prudential Tower
Architect: Charles Luckman Associates

State Street Bank & Trust Company
Office Planning & Design:
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Technology Square, Cambridge
A joint development of Massachusetts Institute
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Travels with Neutra

Greetings from Africa! We are having a most educational and fascinating time since we left New York about the middle of May. I am sure you will be aghast if I just mention the cities we have visited in the order of our travel. If you have an atlas handy you may like to follow us and at the same time keep in mind that in each place visited we either saw a client, a prospect, an editor, a publisher or RJN was invited to lecture. Edinburgh first, then Zurich, Locarno where a very large residence has just been completed.

Then by car to Lausanne, Lille, Paris, Stuttgart, Frankfurt, Mannheim, Cologne, Wuppertal where another residence will be completed soon and another one is in the planning stage. Hamburg, Goteborg, Stockholm, Helsinki, Jyvaskyla, Moscow, Leningrad, East and West Berlin, once more to Stuttgart, Zurich, Locarno, Rome, Tunis, Tripoli, again Rome to catch our flight to South Africa, as guests of the South African foundation visiting Johannesburg, Pretoria, Durban and Capetown. Visiting ministers, industrialists, economists, educators, planners and understanding more and more the complexities of this country and all the housing and educational facilities that have been provided for the black, colored and Indian populations. Most fascinating and revealing.

Then Swaziland, Rhodesia and now after Malawi, Kenya, Ethiopia, Pakistan, Lebanon, again various cities in Europe. Although RJN has had various bouts with doctors, they always managed to fix him up again and so we go on.

Meanwhile our son and partner Dion is carrying on.

One thing is sure, we are becoming more and more citizens of the world. We also had a most interesting two day symposium arranged by the Swiss Richard J. Neutra Institute, with societaires participating and coming from Germany, France, Austria and even Tunisia and giving papers on their ideas of what Bio-realistic building may mean now and in the future.

Dione Neutra

The New Age: cover to cover

I have no superlatives that would do justice to your 75th Anniversary issue. Suffice be it to convey to all that worked on this masterpiece our deep gratitude.

I read the whole issue, cover to cover, and expect to go back to it again and again.

Don M. Ramos, A.I.A.
Los Angeles

more letters on page 114

continued from page 111

Citizen participation

I wish that the open conflict between the City Planning Commission-sponsored proposal and the State-sponsored "Battery Park City" plan on the Hudson would become public and not confined to a privileged few of the political arena.

This latter project is a typical reflection of the sterility built for profit to a few, and for profit alone—as the average project done in the last 20 years.

Nowhere in this plan could one read the texture of life, a feeling of well being that stimulates and enriches the people for which it is supposed to be built. In the volume of this master plan, everything represented is only statistics, economics, and dry life.

Instead of only appointing a politician on each side to iron the City-State conflict, isn't it time—in this era of big words like beautification and demonstration—to consult with a group of outstanding citizens preoccupied with modern urban thought?

Roger Katan
Environmental Designer-Planning Consultant
New York City

Letter to Ben Thompson

As I was skimming through the ARCHITECTURAL RECORD of January 1966—very late of course—and enjoying the new typography and presentation, I was stopped by some beautiful color photographs, and went back to the beginning of the issue, made a pause in a busy morning, and I ended by getting so involved with your article that it became condensed leisure.

You have written movingly about an architect as a man first, and architecture as the subject of his life. I cannot fully thank you for the courage it takes to stand out on a personal philosophy, and to concentrate on things, sometimes considered not important, but that belong to the experience of most of us men, expressed openly and simply, without professional jargon.

I was very happy to use your article as a "time bomb" to shake some skeptics on the values of beauty and order in a healthy and changing society.

Gustavo Munizaga M.A.U.D.
Director
Technical Assistance Program
Universidad Catolica De Chile
Santiago

With a p.s. to the RECORD

Much has been said about such concepts and realities as beauty, harmony, radiance, joy, images, music, and leisure. Things said are not enough. They must be brought into public discussion; they must permeate a society's goals so as to make them "commodities" easily accessible to all. ARCHITECTURAL RECORD should be proud to have written in its pages about beauty in our environment in a most subtle and beautiful way, for we as architects are committed to beauty through creation.

Record Houses

Where can I obtain the latest issue?

C. E. Ferguson
Normandy Beach, New Jersey

The annual house issue is published in book form, and should be available in your local bookstore. If your store does not have a copy, write to the McGraw-Hill Bookstore, 330 West 42nd Street, New York City. Cost per book is $2.95.

I would like to express my thanks once again for the wonderful push you gave me when you published the Kimmet house in the 1963 Record Houses. Last week another prospective client came in because he had seen a copy of that issue.

G. Peter Jennewein, A.I.A.
New York City

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Bradley

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Shaky windows

Why should the contractor check the financial strength of any component supplier? Because two kinds or risks threaten: building components may be cheapened below the intent of the specifications; inadequate capital and production facilities may delay deliveries beyond the financial peril point. Taken together, **everyone** connected with the project gets a black eye.

The William Bayley Company is financially sound, with the ability as well as the desire to meet responsibilities for quality and customer satisfaction. We deal solely with suppliers of integrity. It is the only way we know to build the finest windows and assure on-time delivery. This policy does not lower window prices, but it certainly has built repeat business. Solid windows result from responsibility.
THE WILLIAM BAYLEY COMPANY, Springfield, Ohio

Write for new 1967 window catalog.

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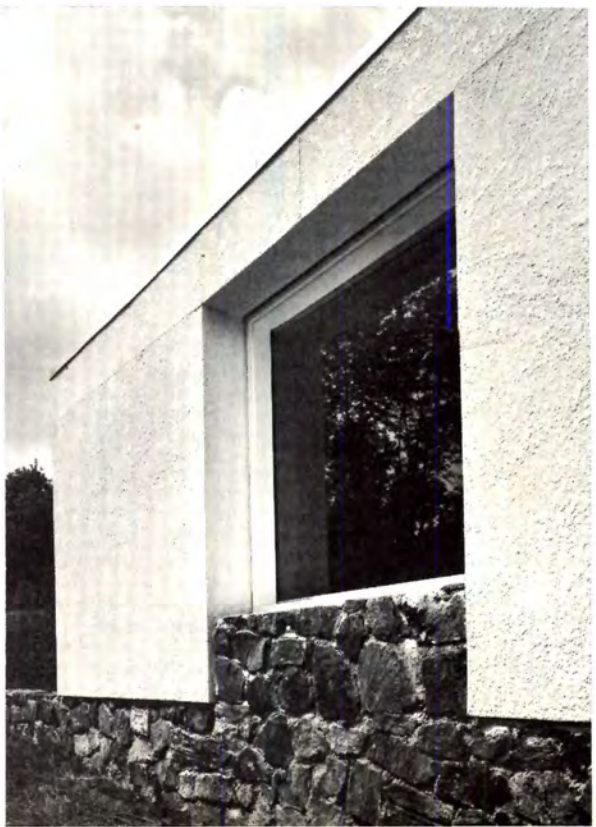
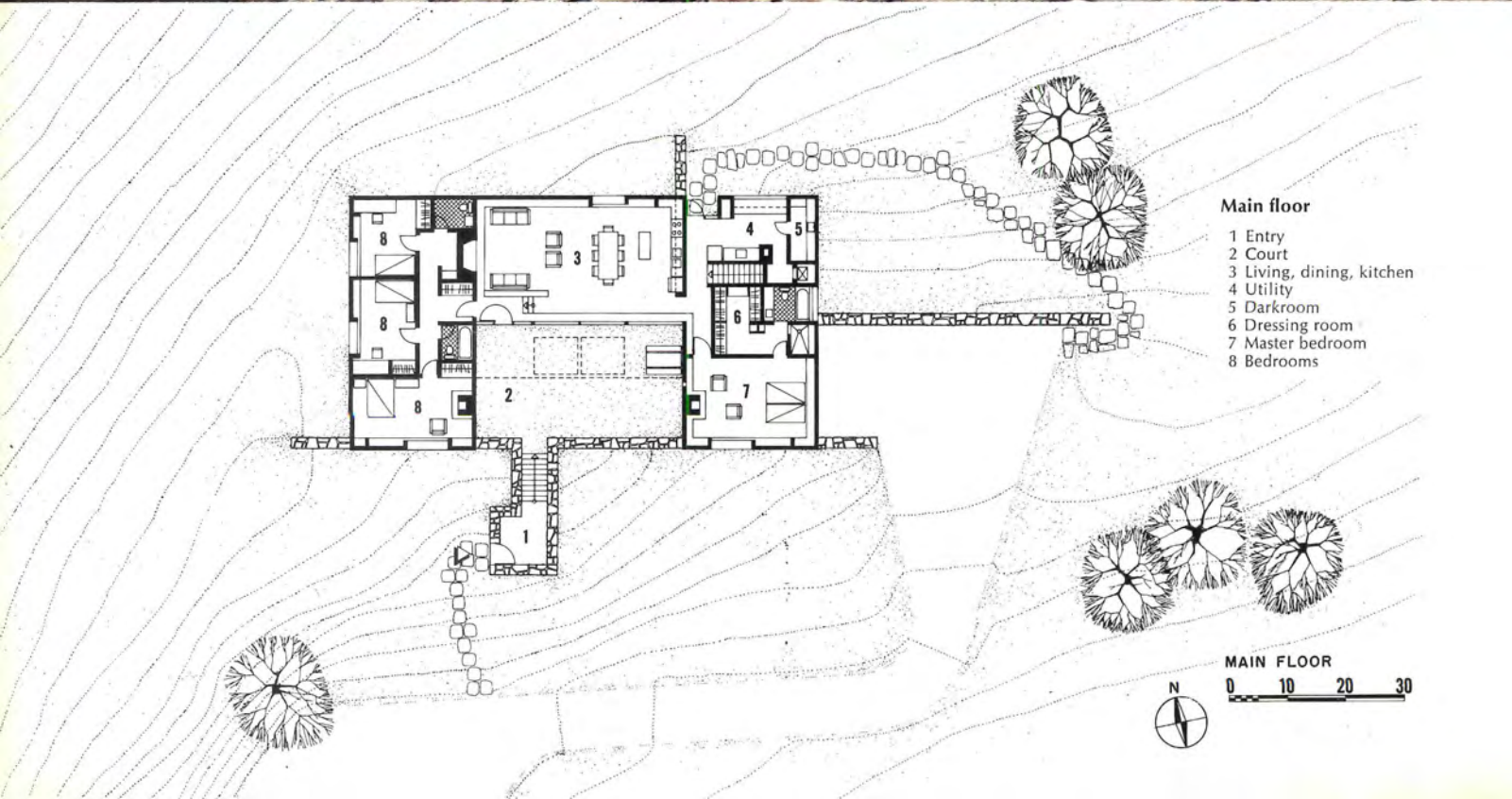
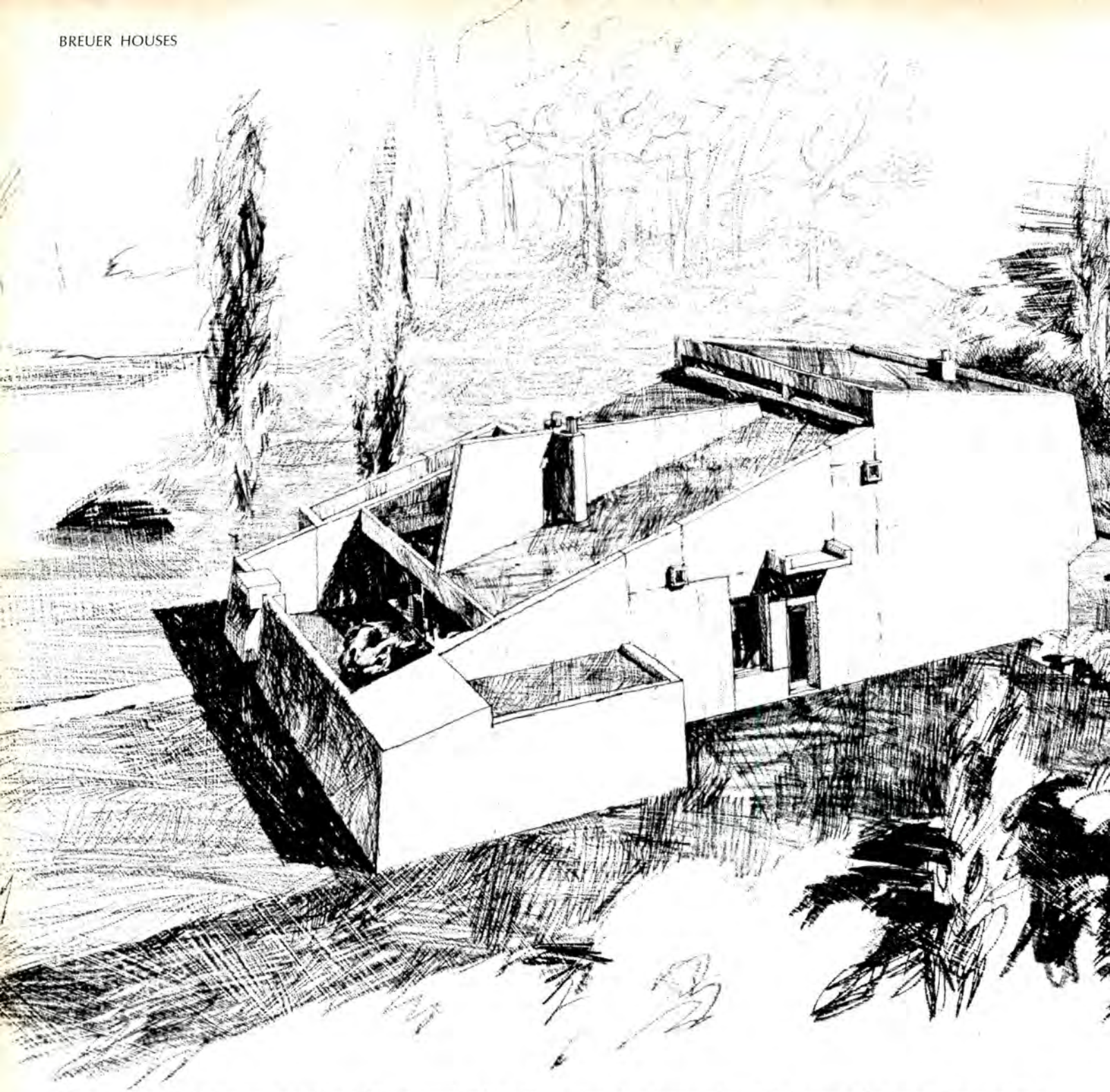
The rough stone walls which form the base of the Stillman house and enclose the entry court, are extended inside the house to provide attractive seating areas and as a base for sculpture and other objects and ornaments.




Main floor
1 Entry
2 Court
3 Living, dining, kitchen
4 Utility
5 Darkroom
6 Dressing room
7 Master bedroom
8 Bedrooms
MAIN FLOOR
0 10 20 30
N

Interiors of the Stillman house repeat many of the elements of the exterior: white stucco walls inside the house, offset by red brick floors and dark-stained cabinet work, provide an effective background for paintings and sculpture. The walled courtyard is treated as an outdoor extension of the general, informal, living-dining area.



■ "The Van der Wal House was planned for a couple who will have frequent visits from married children and their families. The couple has an impressive collection of sculpture which is housed primarily in the enclosed entrance court, living room, terrace and large platform adjacent to the terrace.

"All interior surfaces of the house are of smooth white plaster, serving to form additional space sympathetic to sculptures and paintings. The interior wall surfaces are textured with a special pattern of inserts in the plaster, which receive devices for hanging pictures. This arrangement of inserts permits frequent changes in location and changes to the collection to be made with ease. The consistent whiteness of the interior is interrupted only by a red brick floor.

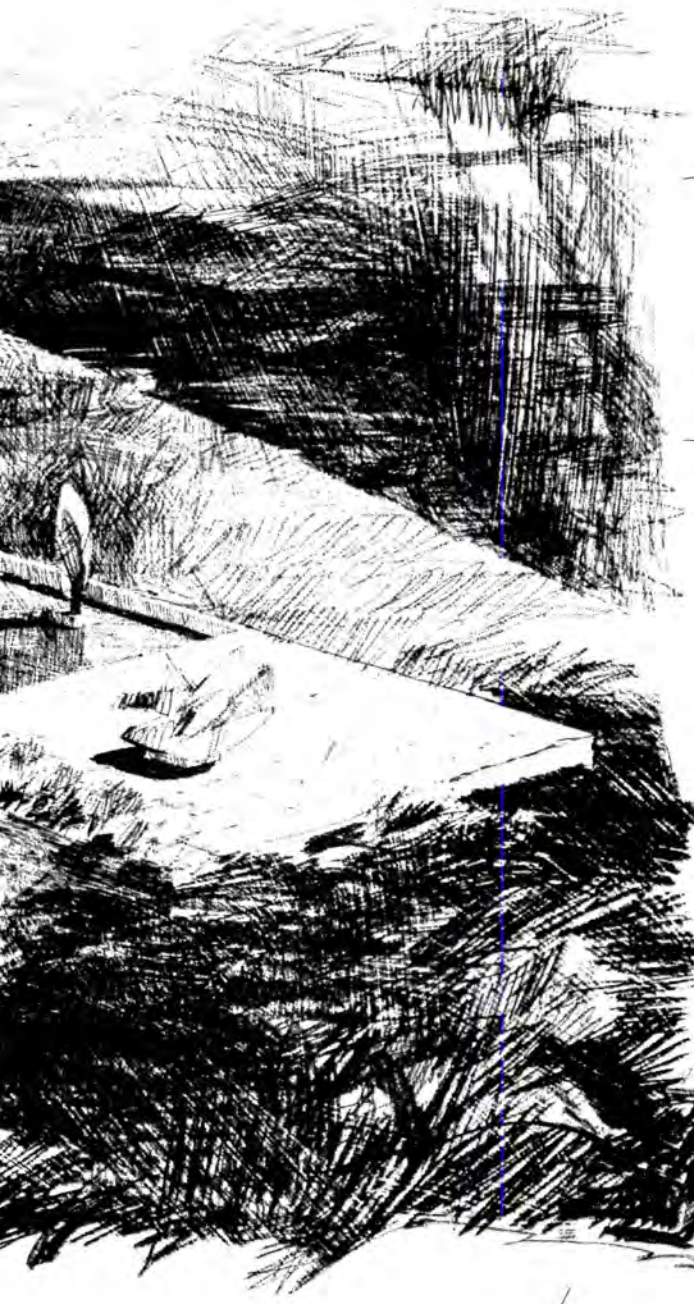
"The structure of the building consists of a homogeneous reinforced concrete construction—a combination of bearing walls, columns, beams and slabs. This structural system is exposed on the exterior of the house in the form of textured concrete achieved by the use of tongue-and-groove V-jointed board forms. The roof forms are reflected in the interior spaces of the house.

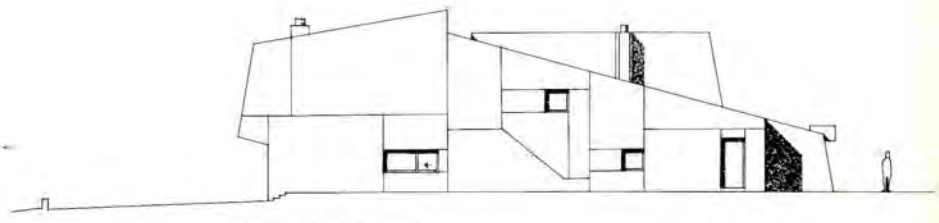
"The Van der Wal house is situated on a comparatively small urban lot bounded on the east and west by neighboring houses and on the north by a public road. Consequently, the principal areas of the house are turned to the south. The living rooms and bedrooms have a vista over a canal to a wooded area beyond. The public road is shielded from the glass entry areas by the enclosed sculpture court."

VAN DER WAL HOUSE

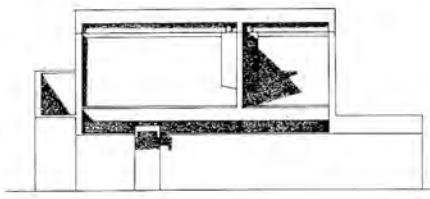
Amsterdam, The Netherlands, 1964

Architects: *Marcel Breuer and Hamilton Smith*

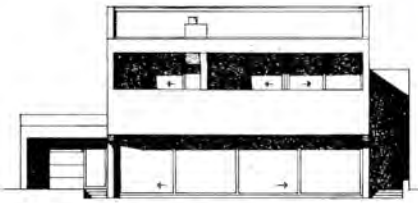




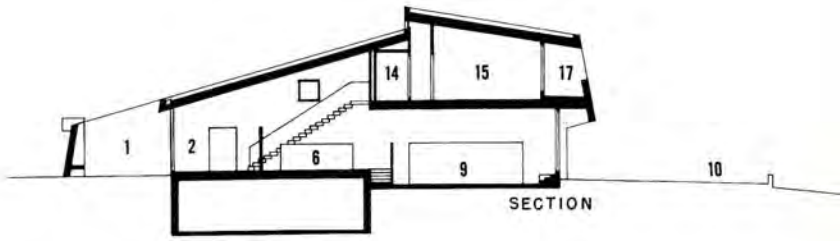
EAST ELEVATION



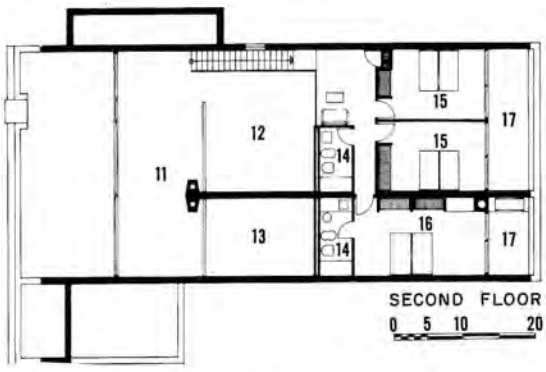
NORTH ELEVATION



SOUTH ELEVATION



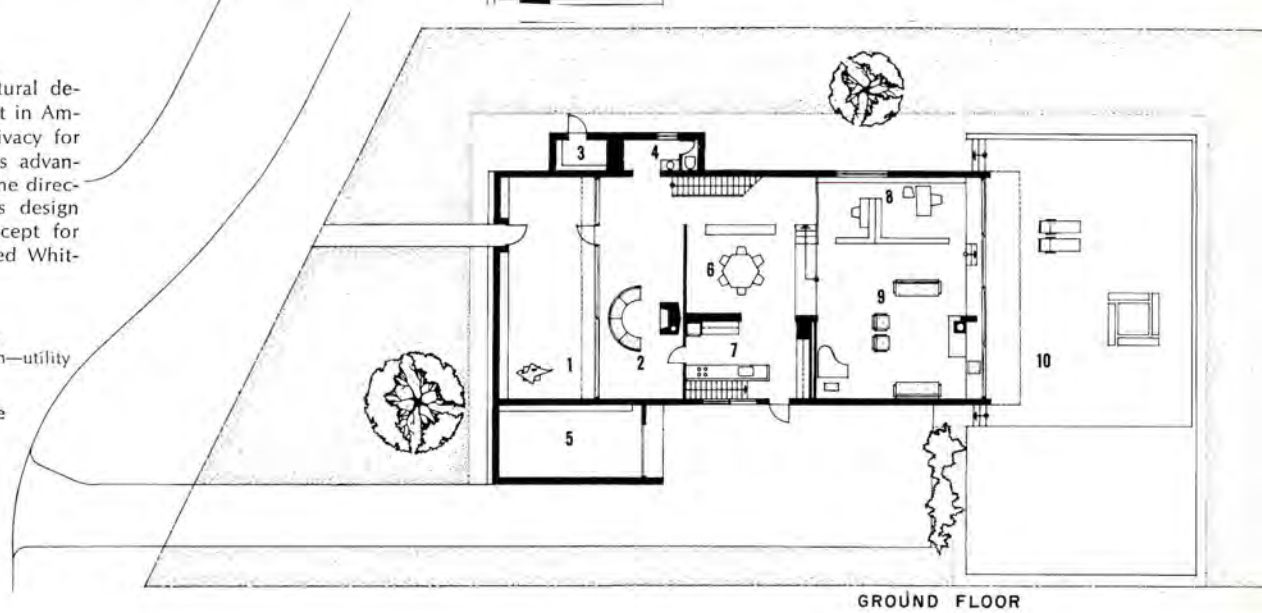
SECTION



SECOND FLOOR

0 5 10 20

N



GROUND FLOOR

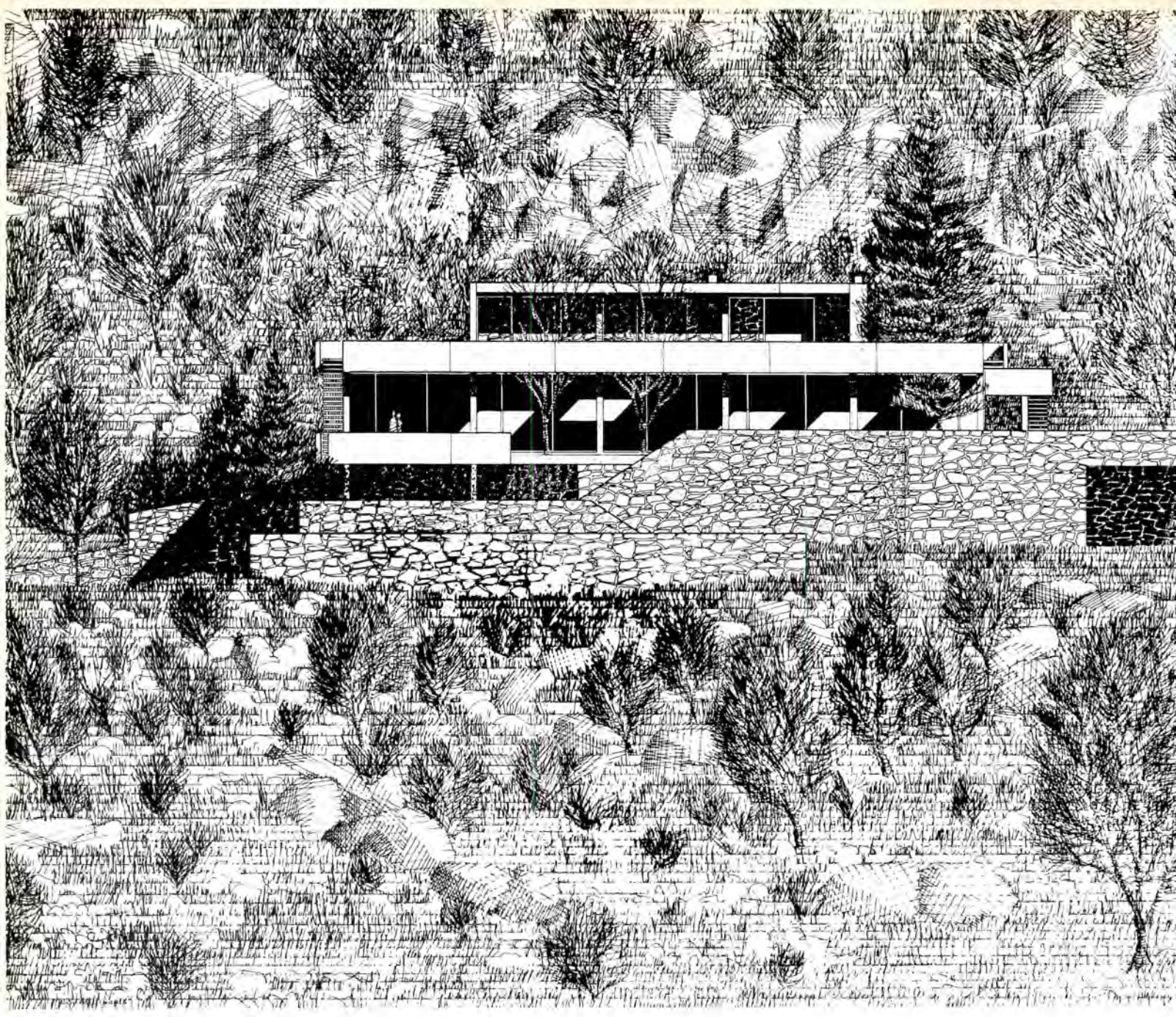
This unusual, rather sculptural design for a restricted city lot in Amsterdam provides great privacy for all major rooms, but takes advantage of the good view in one direction. One can see in this design overtones of Breuer's concept for New York's recently opened Whitney Museum.

Ground floor plan

1 Courtyard
2 Gallery
3 Garden tools
4 Coats—lavatory
5 Garage
6 Dining
7 Kitchen—utility
8 Study
9 Living
10 Terrace

Second floor plan

11 Upper Part—gallery
12 Upper Part—dining
13 Upper Part—kitchen
14 Bath
15 Bedroom
16 Bedroom
17 Balcony



■ "The Koerfer house is built on a rugged hillside, affording an exceptional vista sweeping from Southeast to Southwest over Lago Maggiore. The steep terrain demands building of terraces to provide level areas for outdoor use. Actually, the house, its terraces and retaining walls are a barrier between the entry side of the house and gardens on the far side. These garden areas are reached for maintenance purposes by means of a tunnel at the lower level or through the house at other times. The tunnel is expanded into garage space at the entry side.

"Access to the house is by means of a winding road from below. After parking, one reaches the main level by means of a stepped ramp framed between the hill and the wall of the structure. The ramp leads to an entrance court, also bounded by the hillside and the walls of the home.

"The building is arranged in three levels. The first or lowest level is occupied by servants. The second or main level contains the principal living areas, master bedroom and study. The third level is occupied by children's rooms and guest facilities.

"The main floor is divided into zones with a higher and lower elevation giving greater ceiling heights at the living areas. This change of level is reflected in the main terrace which runs the length of the house and is connected by exterior stairs to the roof terrace and to grade level.

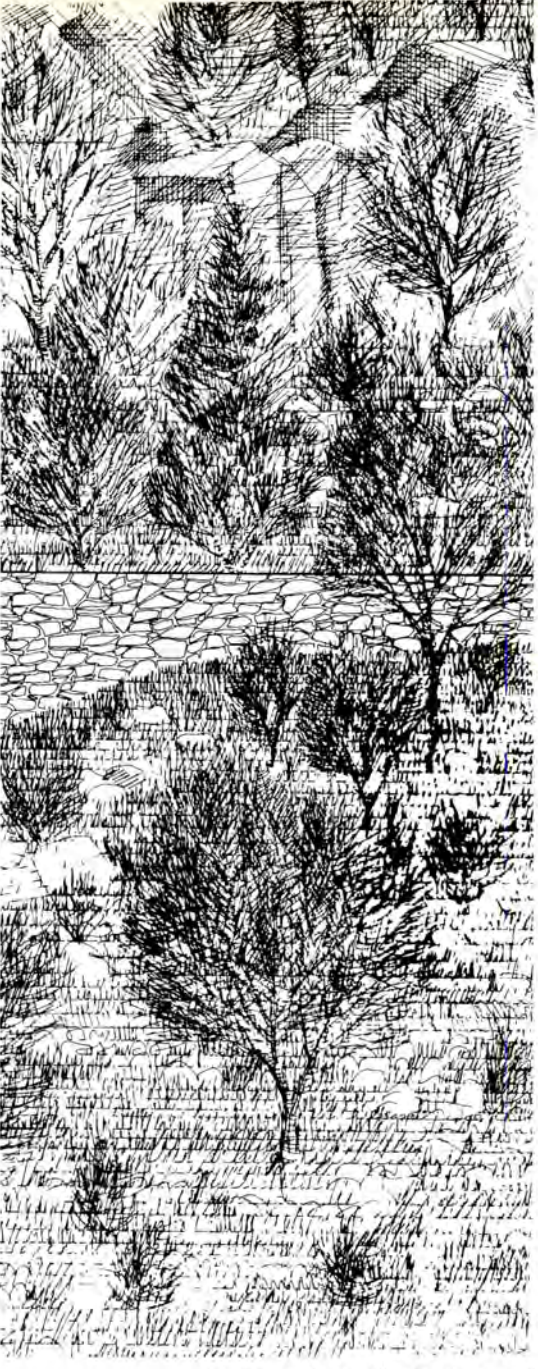
"The structural system consists of a complete, enclosed concrete frame of architectural finish in combination with a number of exposed concrete walls and parapets. The frame is filled with a rubble stone of local split granite and in other cases with large panels of frameless sliding glass windows. Granite has also been used for retaining walls and all floors.

"Inside the house, the same structural frame is still very much visible and is actually extended to form baseboards. Lighting is heavily influenced by the demands of showing a fine collection of paintings."

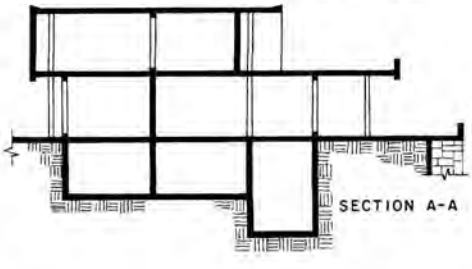
KOERFER HOUSE

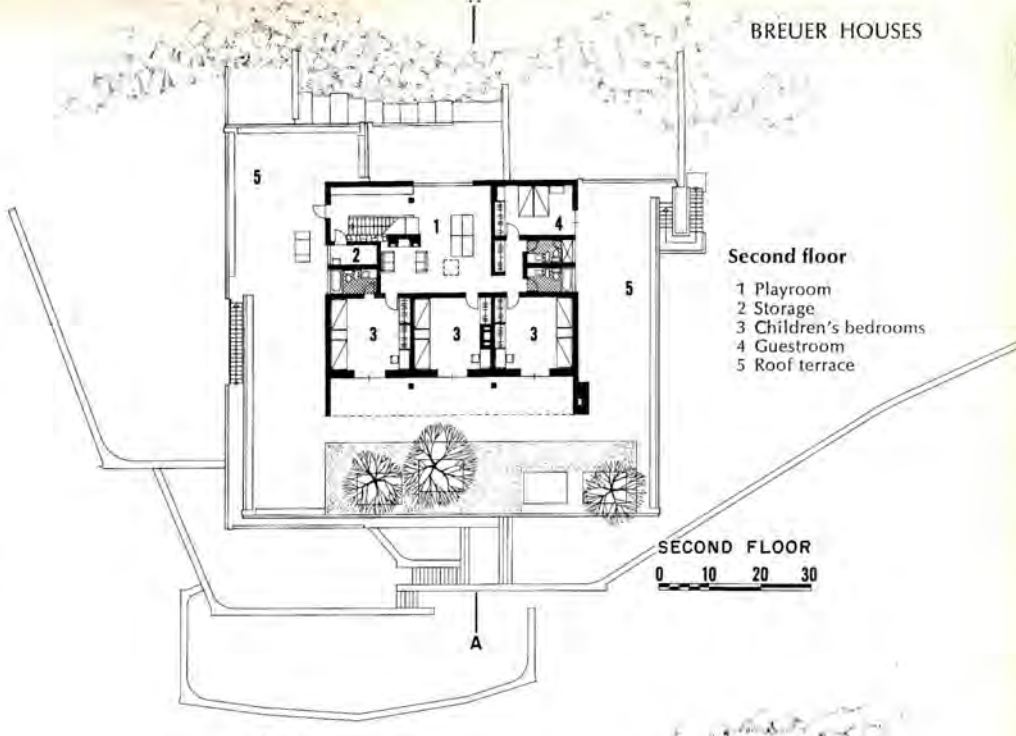
Moscia, Tessin, Switzerland, 1966

Architects: *Marcel Breuer and Herbert Beckhard;* structural engineer: *Bene Meyer;* lighting consultant: *Edison Price;* construction supervision: *Rudolph Frank*



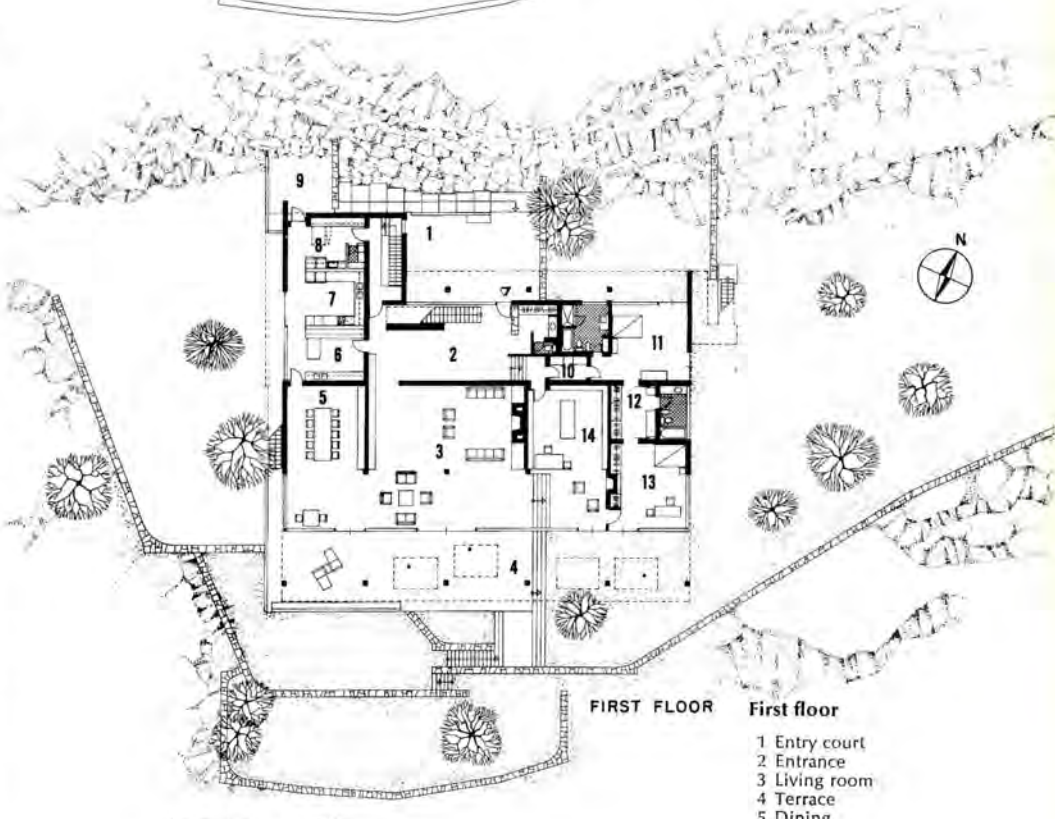
The strength of this elevation and the dominant use of local stone with exposed concrete walls and parapets serve to emphasize, while providing an effective contrast to, the rugged character of the site. The use of terraces allows the owners to take maximum advantage of a dramatic view. A stepped path leads up the hillside to an all-weather pool.





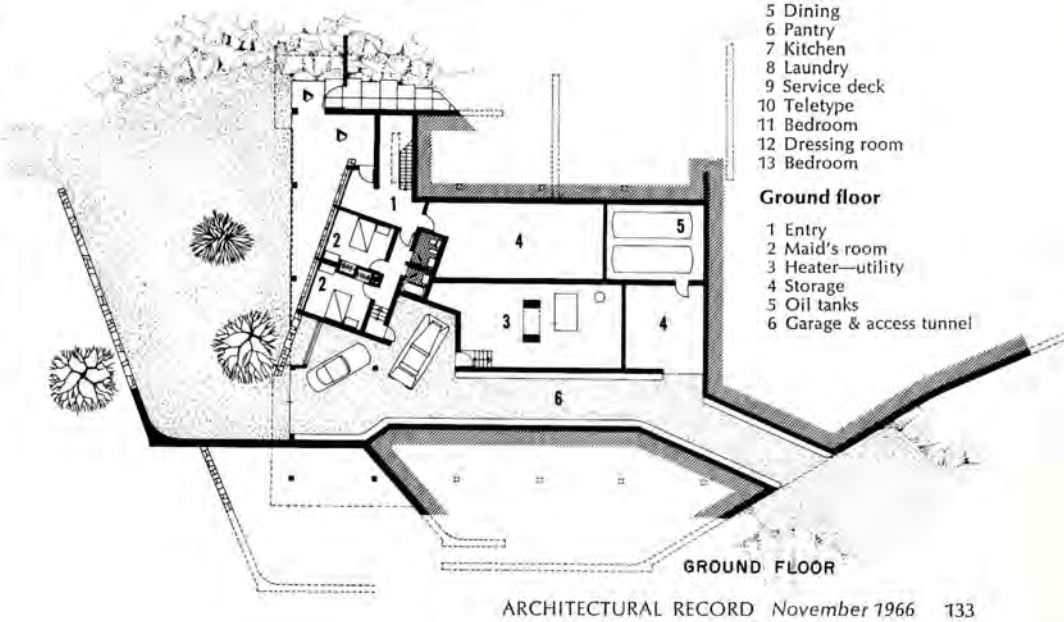
Second floor

1 Playroom
2 Storage
3 Children's bedrooms
4 Guestroom
5 Roof terrace



First floor

1 Entry court
2 Entrance
3 Living room
4 Terrace
5 Dining
6 Pantry
7 Kitchen
8 Laundry
9 Service deck
10 Teletype
11 Bedroom
12 Dressing room
13 Bedroom



Ground floor

1 Entry
2 Maid's room
3 Heater—utility
4 Storage
5 Oil tanks
6 Garage & access tunnel

■ "The original Breuer house—designed in 1945—was built in 1948 with a minimum budget and in a rather primitive fashion as a vacation house directed at informal living and minimum housekeeping chores. One of the interesting components of the original house are the frameless sliding windows—the first experiments along these lines by the architect. The house was sheathed with ⅜-in. waterproof striated plywood, the back side of which was visible inside the house, in combination with exposed wood studs and joists. The details of windows, doors, etc., anticipated the subsequent addition of vertical cedar tongue-and-groove siding on the exterior, and of wallboard and plywood ceilings on the interior. These new materials perpetrate the low maintenance, easy housekeeping philosophy.

"The studio addition of 1961 is connected to the original house by an ample wood deck. This deck further serves as an entrance deck and sun deck.

"In 1963, a mirror image of the house was built for Howard Wise [owner of the Wise Gallery in New York]. The reversal of the plan was caused by the demands of the new site.

"In brief, the structure may be described as an economical adaptation of typical New England frame construction. The building is elevated above grade permitting an uninterrupted flow of the terrain underneath. Variations in terrain are accommodated by varying the length of the supports. These wood posts are cantilevered down to concrete foundations in a balloon framelike manner.

"Both houses are built with special effort to avoid cutting the surrounding pitch pines, typical of the Cape Cod scene. There is no additional landscaping. The natural form of sand dunes and clumps of pines exist untouched and in their original form."

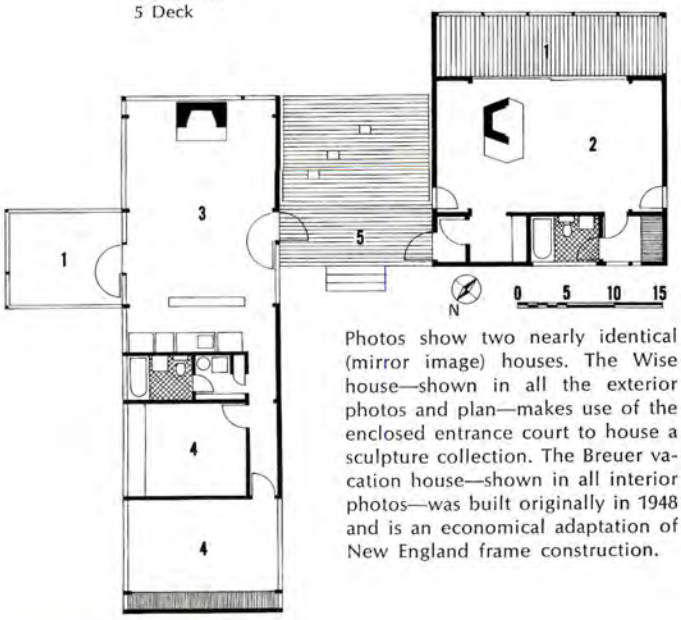
BREUER AND WISE SUMMER HOUSES

Wellfleet, Massachusetts, 1948 and 1963

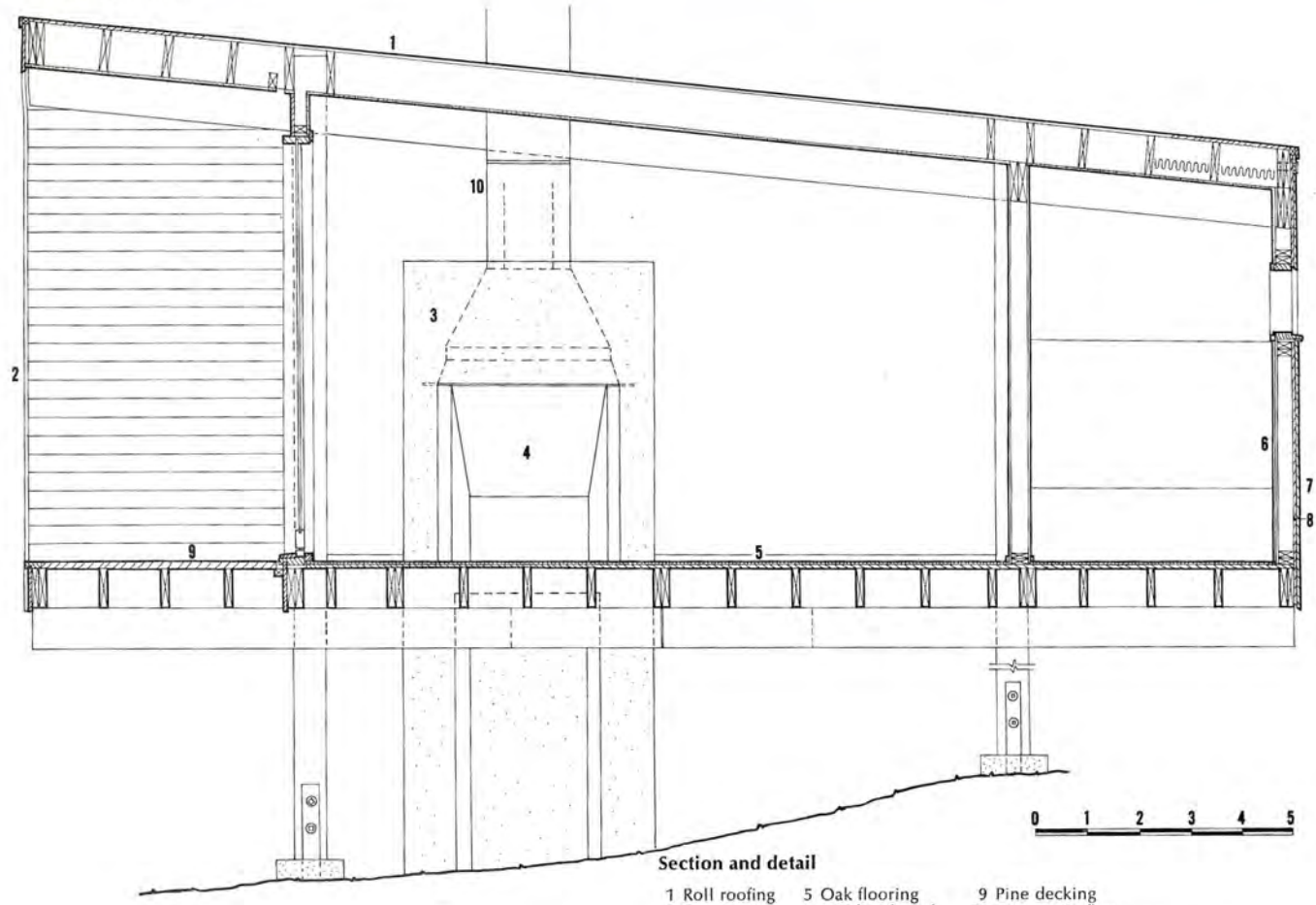
Architect for the Breuer house: *Marcel Breuer;* architects for the Breuer house addition and the Wise house: *Marcel Breuer and Herbert Beckhard;* contractor: *Ernest Rose*

Joseph W. Molitor photos

Main floor
1 Screened porch
2 Studio
3 Living
4 Bedroom
5 Deck

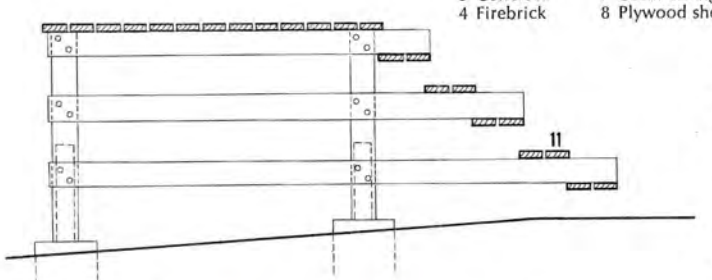


Photos show two nearly identical (mirror image) houses. The Wise house—shown in all the exterior photos and plan—makes use of the enclosed entrance court to house a sculpture collection. The Breuer vacation house—shown in all interior photos—was built originally in 1948 and is an economical adaptation of New England frame construction.



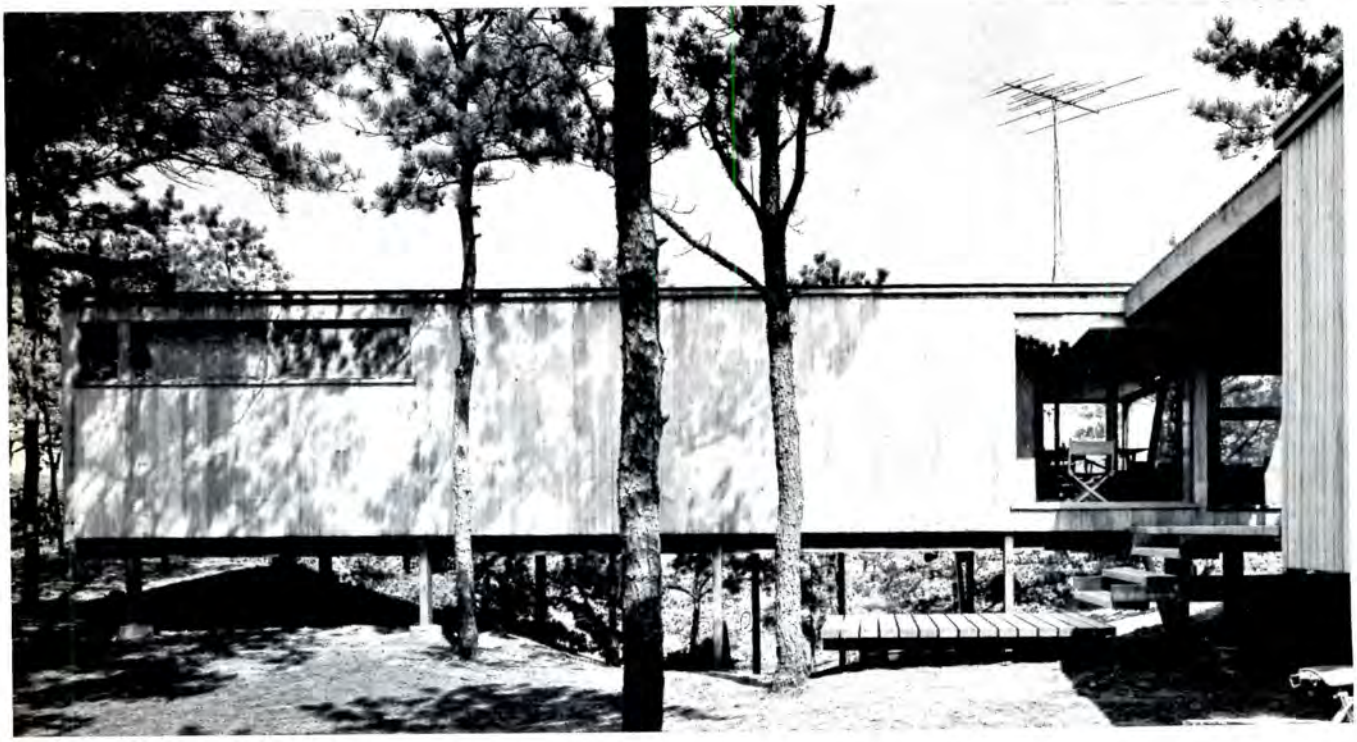
Section and detail

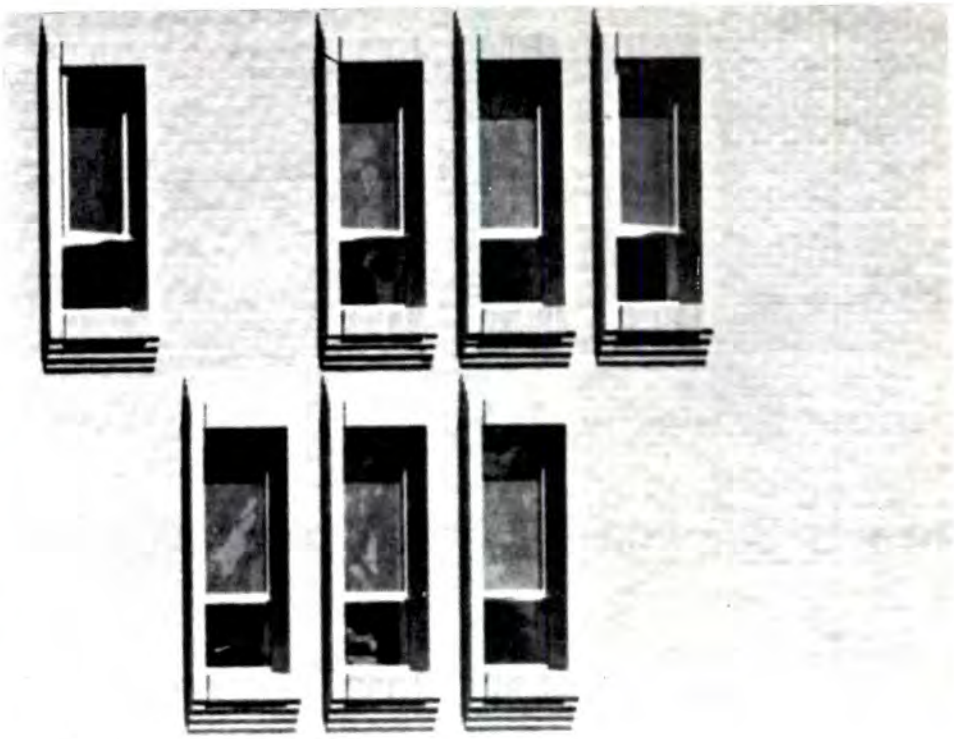
1 Roll roofing
2 Screens
3 Concrete
4 Firebrick
5 Oak flooring
6 Building board
7 Cedar siding
8 Plywood sheathing
9 Pine decking
10 Terra cotta flue
11 Treads 2—2 in. by 6 in. screwed

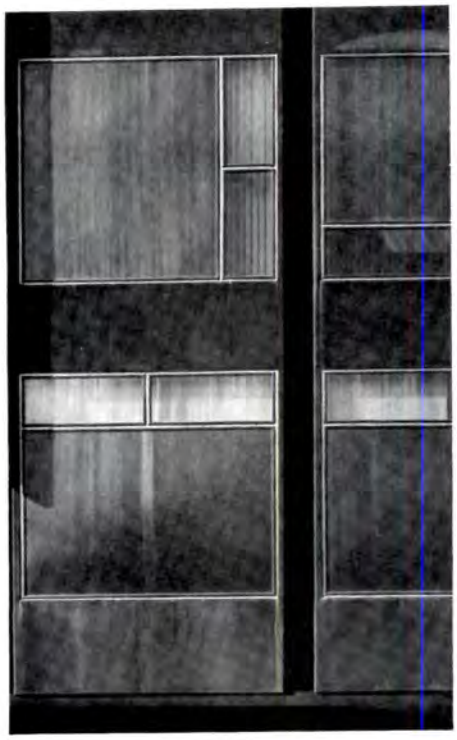


STAIR SECTION

The studio of the Breuer house—shown in the section above—was added in 1961, and connected to the house by an entrance deck which is also used for sunbathing. Site considerations were responsible for the reversal of the plan in the case of the Wise house—shown in the photo below. The stair detail is the same as that shown in the photo of the Wise house.



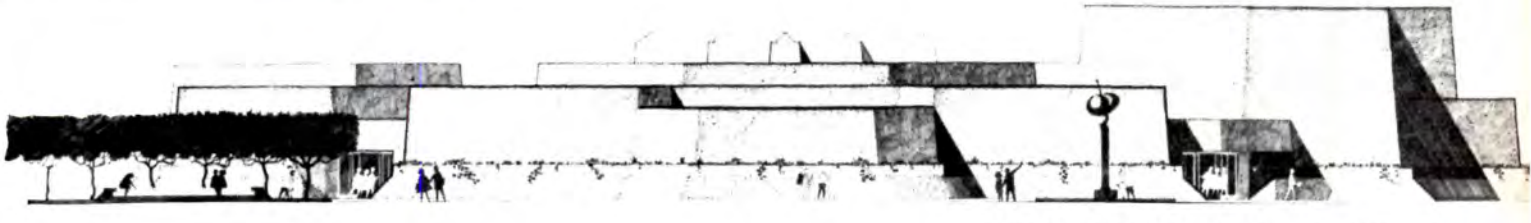




Balthazar Korab photo

Proper use of the proper material: an integral part of the design idea

The choice of materials, say architects Philip Meathe and William Kessler, "should be inherent in the design concept. The task, then, is to express and exploit the chosen material for maximum effect." The four buildings on the pages that follow—a masonry bearing wall public housing project, a shingled vacation cottage, a concrete university lecture building, and a metal and glass college science hall—are explorations by Meathe and Kessler into the art of the proper use of the proper material.



The site is very favorably located for housing the elderly, many of whom shun the idea of being semi-isolated in a country or suburban home. This plot is situated on the main street of the town, only a block from the business district. At ground level, the common recreation room opens to a terrace which overlooks the adjoining park, an area bounded by a picturesque stream meandering through a wooded glen.

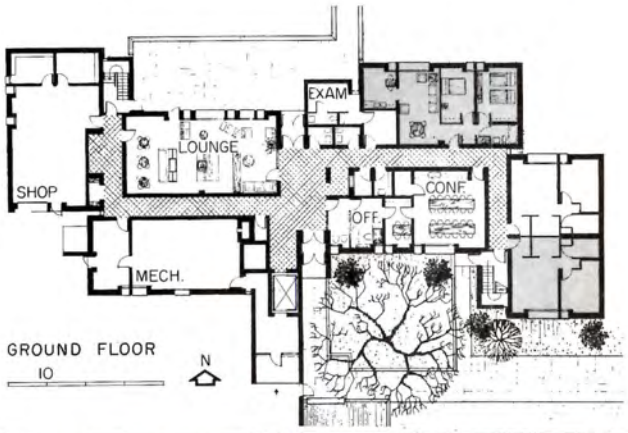
Masonry bearing wall for residential scale

In dealing with the difficult problem of achieving human scale in medium-rise housing, architects Meathe and Kessler developed this building as a cluster of relatively small sized vertical elements—freely disposed—and chose to enclose them in brick faced masonry bearing walls. The over-all scale was thus reduced; and the brick contributed to the residential feeling, providing a sympathetic relationship to the pleasant college town of Oberlin, Ohio, where brick is widely used. In moving away from the usual horizontal planning of such a project into the development of vertical groupings, the opportunity arose to design "units" of apartments connected by well lighted and well ventilated corridors. For such an arrangement, masonry bearing wall construction proved to be both economical in cost and easy for local craftsmen to handle. Fenestration—consisting, appropriately enough, of "punched" window openings—is disposed in a pattern that is ordered but not repetitious, random yet disciplined. The brick construction is emphasized, and a play of light and shade achieved, by a special projected coursing about the window openings.

Fifty one-bedroom units of varying sizes are provided on upper floors; community facilities, maintenance shop, and manager's apartment at first floor level. Interior finishes: block walls, asphalt tile floors, painted concrete ceilings.

JOHN FREDERICK OBERLIN HOMES, OBERLIN, OHIO. Architects, mechanical and electrical engineering: *Meathe, Kessler and Associates;* structural engineers: *McClurg, McClurg, Paxton & Mikle;* landscape architect: *Wayne Laverty;* general contractors: *T. J. Hume Company.*

SECOND FLOOR



GROUND FLOOR

10

N

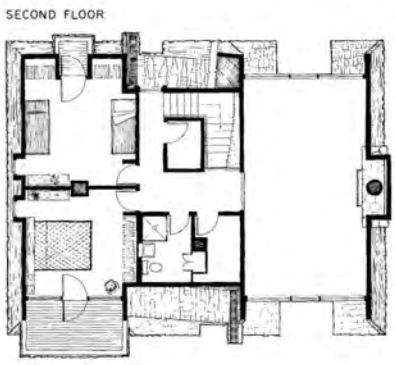
Balthazar Korab photos

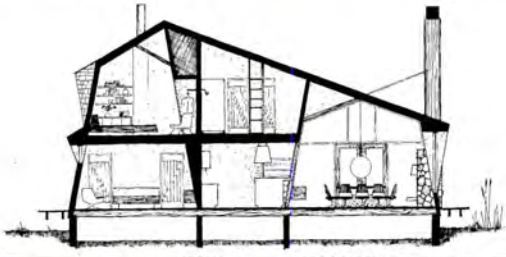
Shingles, fanciful shapes for a carefree cottage

What sort of feeling should a vacation house have? "It should set up a certain spirit and fantasy—of relaxation, fun, escapism—that would be inappropriate in a normal, year-around residence," says Philip Meathe. "At its most exciting, its design should be a complete departure from the usual, so it can contribute to the relaxed, holiday mood of its users. Our approach was strongly conditioned by these considerations—within the owners' requirements, of course. Hence, the fanciful shapes and use of natural shingles in random pattern, in combination with rough-sawn boards. Since we were not searching for a wild contrast with nature, but rather for materials and forms harmonious with the wooded setting—which would age with the area, serving human comfort in the process—we chose wood."

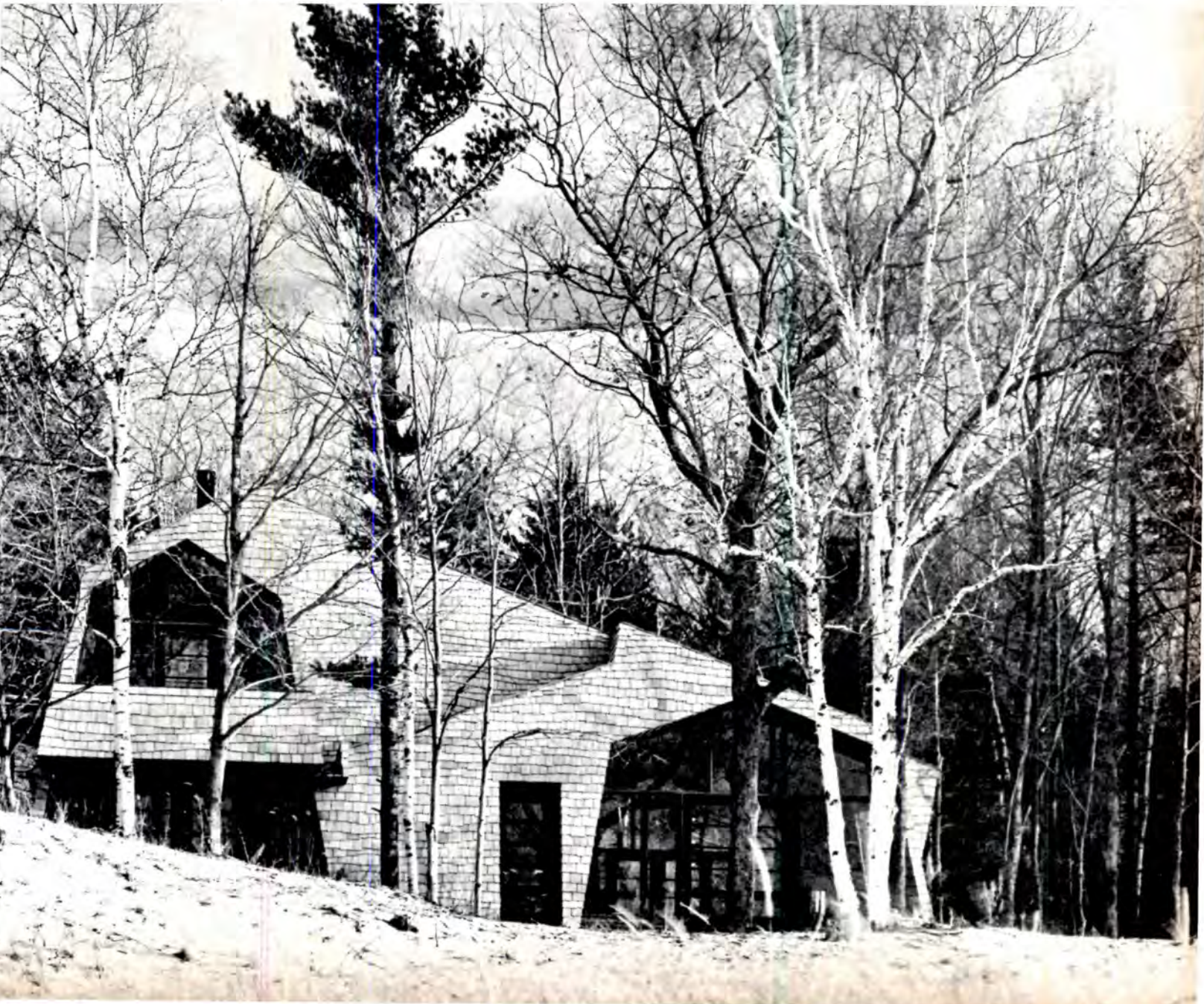
Lying on the eastern shore of Lake Michigan, the appealing site is heavily wooded by a large variety of mature trees. The cottage is planned for two families, and its four bedrooms can accommodate 12. The large living-dining area and alcove-kitchen reflect the informal mode of living specified by the owners. Interior finishes—constructed by the owners over a wood frame provided by the contractor—consist of wood flooring, and of rough-cut, tongue-and-groove boards for walls and ceilings. Exterior and interior wood is left natural.

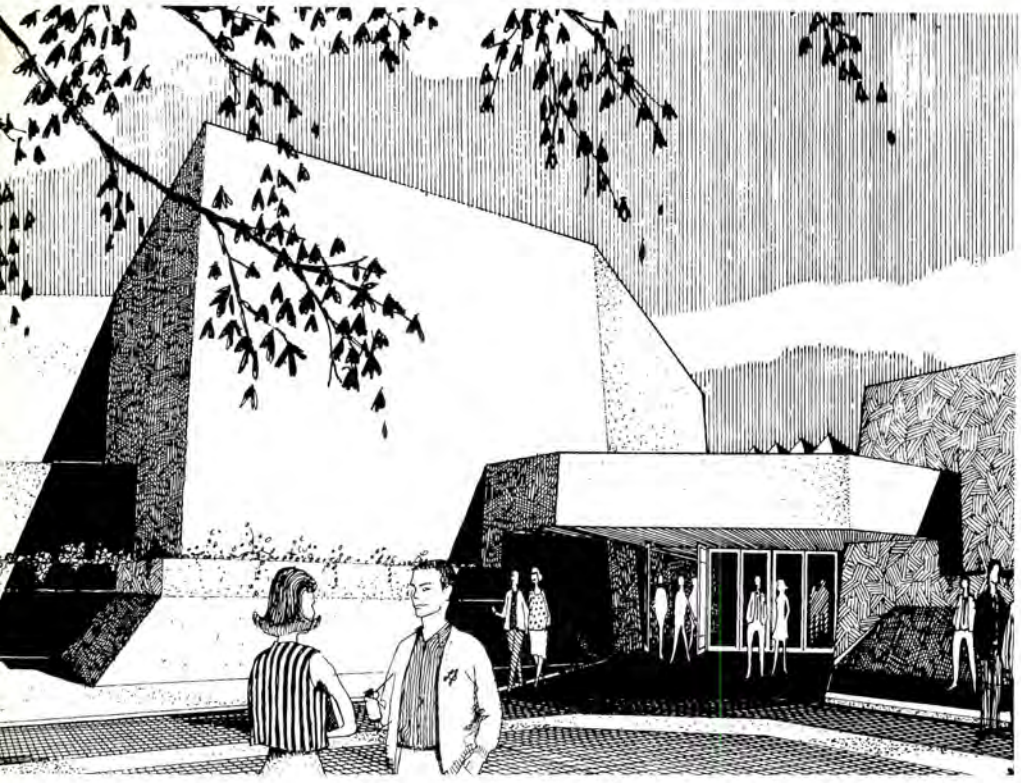
SWAINSON-WHITEHEAD VACATION COTTAGE, MANISTEE, MICHIGAN. Architects, structural, mechanical, and electrical engineering: *Meathe, Kessler and Associates;* general contractor: *W. H. Schuelke.*

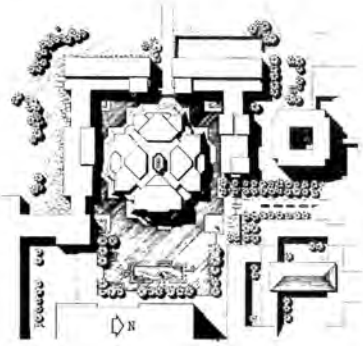




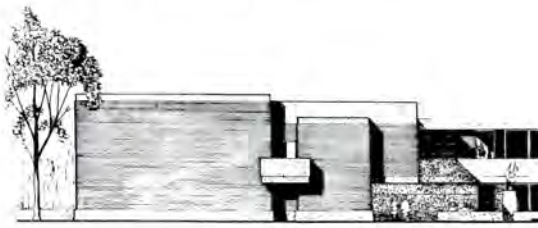
Footings are of concrete, foundation walls of concrete block; the frame is of wood, the exterior of random natural cedar shingles, the interior walls and ceilings of rough-cut pine boards, the floors of oak; the wood sashes are glazed with ¼-inch plate glass; the flashing is copper; the cottage is insulated by 3-inch glass fiber blankets and heated by forced warm air.







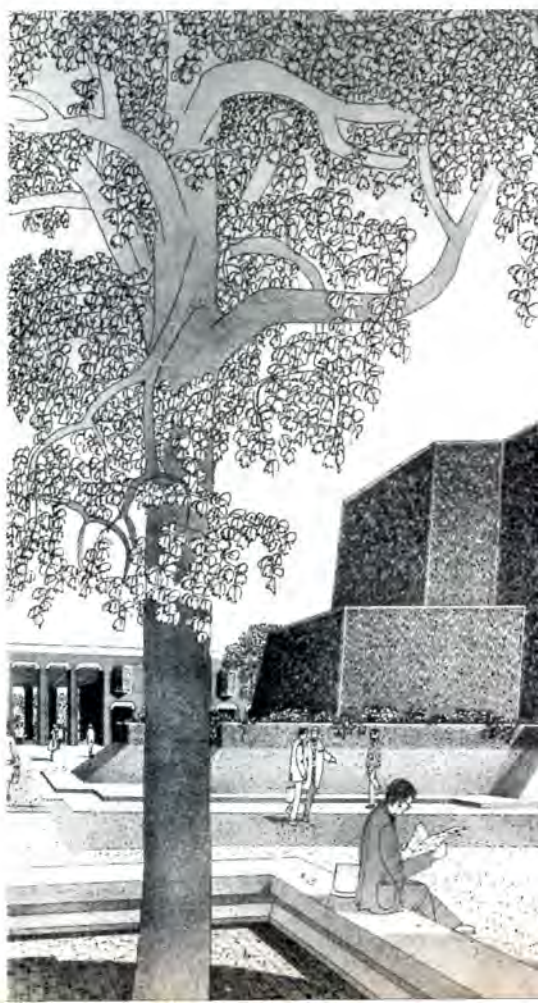
Rear-screen projection rooms are furnished for each of the seven major lecture halls, as well as separated circulation for A-V technicians and for faculty, to preparation rooms below. The plans at right show how separated circulation was achieved, and student entrance to all lecture halls from the rear. The interiors of the lecture halls should be striking as well as efficient, with rough board formed concrete walls, black acoustical tile ceilings, and over-all, carpeting in vivid colors.

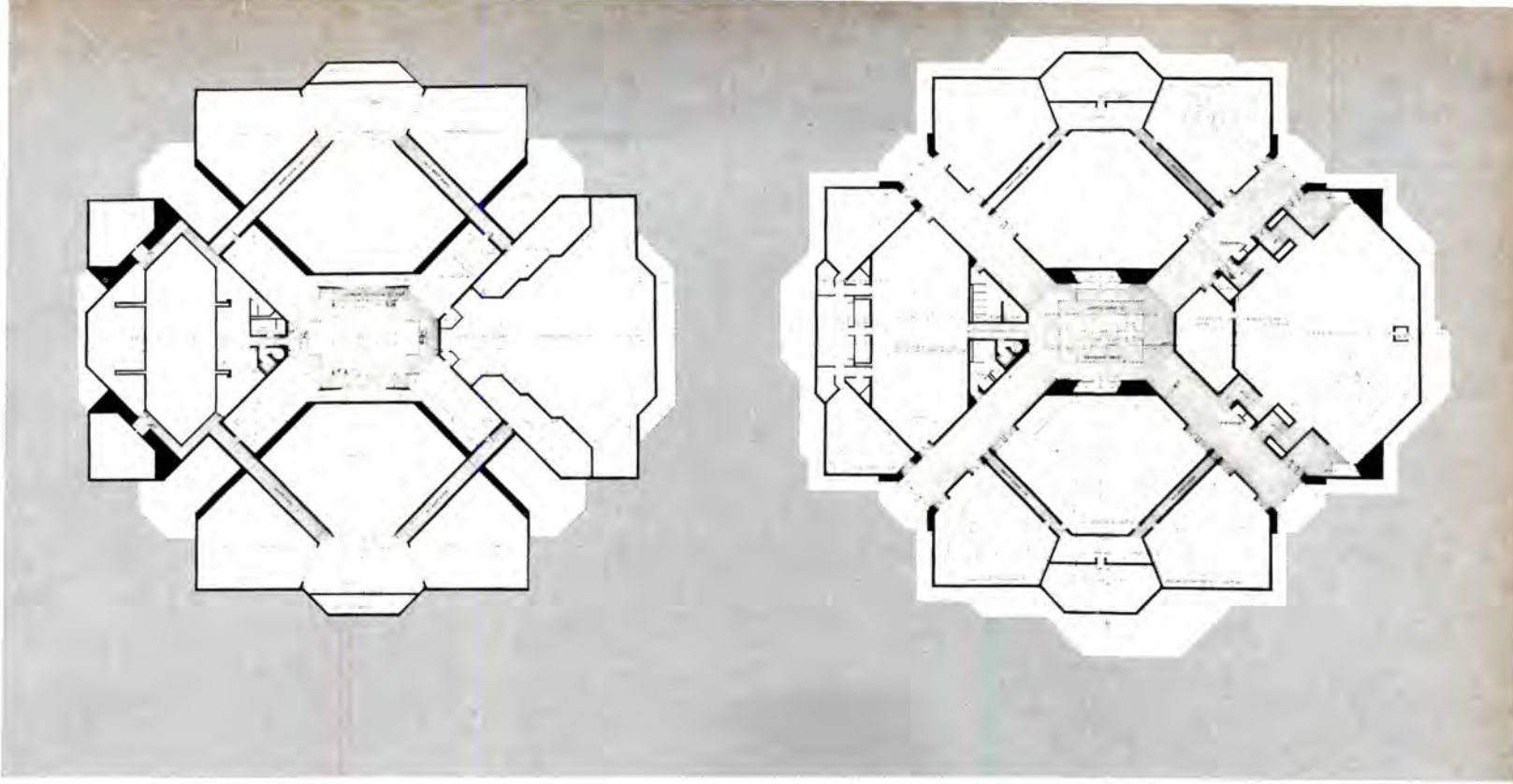


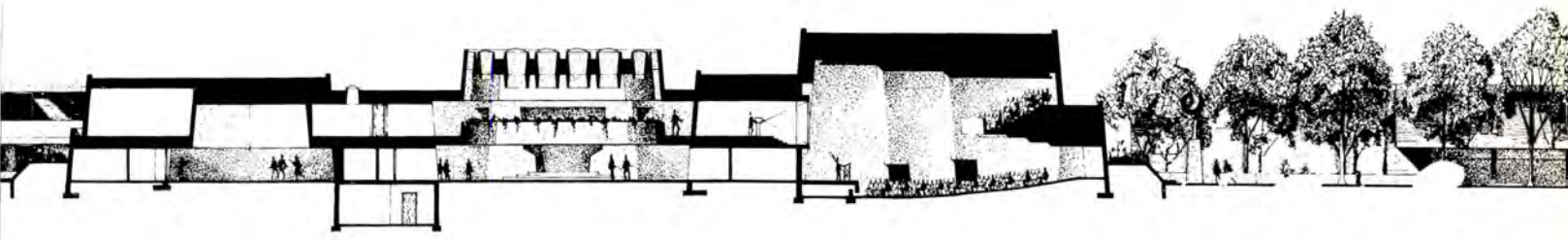
Concrete for complex forms of a lecture hall

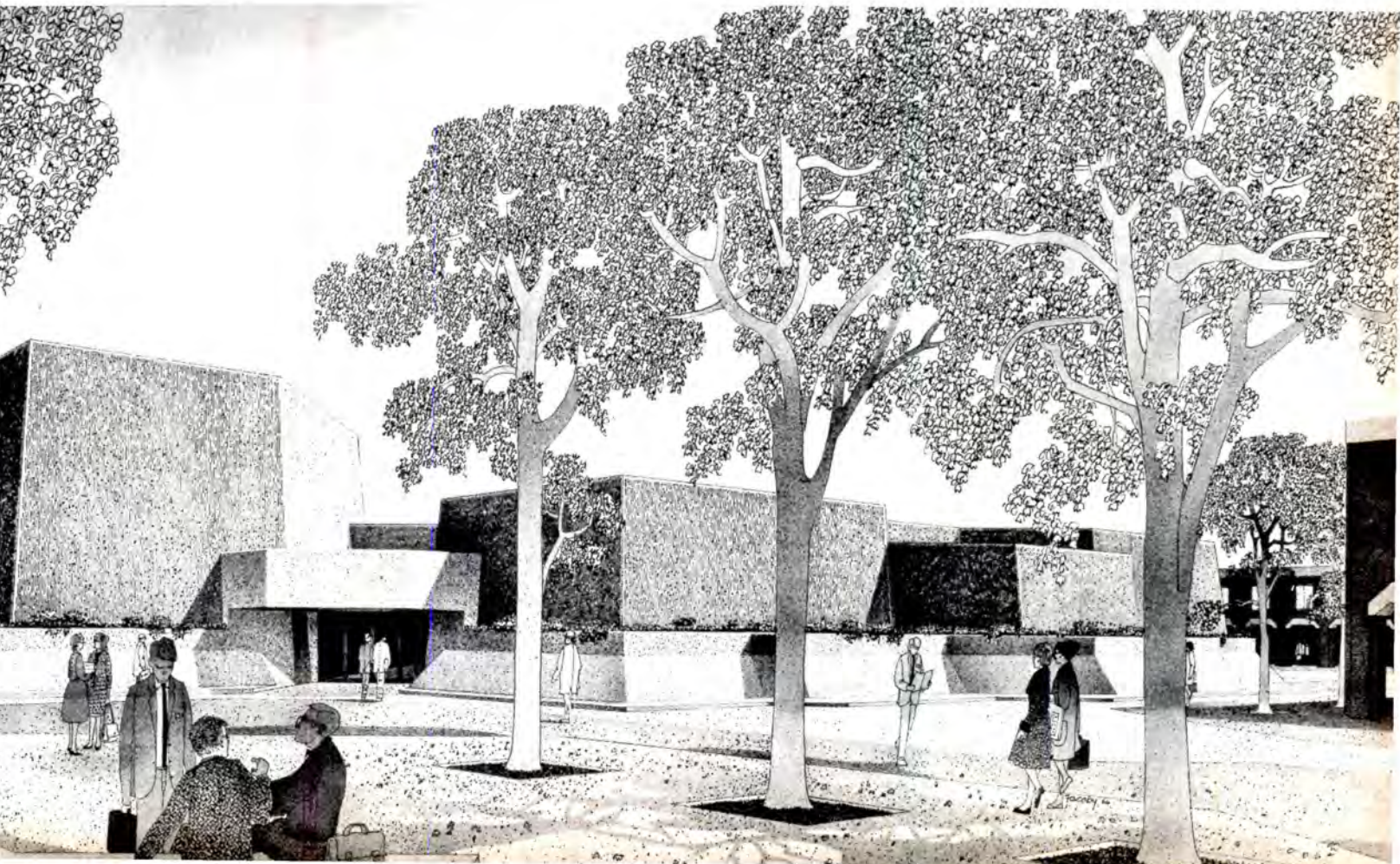
Concrete construction seemed a logical choice for the irregular and complex forms of this lecture halls building, to be built on the Stony Brook campus of the State University of New York. The shape of the building was determined by function, i.e., by a studied handling of the necessary requirements of people—both in motion and at rest—and of audio-visual devices—both in preparation and in use. Of course, the appearance and scale of the building, as it will relate to other buildings nearby and to the master plan, were important considerations also. This structure is designed to accommodate 2,000 students in 10 automated lecture halls of varying sizes. Every effort was made to assure optimum conditions of seeing and hearing, and the resulting forms practically dictated the use of concrete. The exterior of the buildings will have a "torn" concrete surface: a texture resulting from pulling away embedded sheets of diamond mesh before the concrete has taken its final set. The configuration of the building—determined by function—led the architects to regard it as an element *growing out* of the plaza rather than as a freestanding entity *in* a plaza. The canted walls also stemmed from this kind of reasoning.

LECTURE HALLS BUILDING, STATE UNIVERSITY OF NEW YORK, STONY BROOK CAMPUS, STONY BROOK, LONG ISLAND, NEW YORK. Architects: *Meathe, Kessler and Associates;* structural engineers: *McClurg, McClurg, Mikle & Cooper;* mechanical and electrical engineers: *Meyer Strong & Jones;* landscape architects: *Zion and Breen;* acoustical consultants: *Bolt, Beranek & Newman;* general contractor: *Rosoff Brothers.*







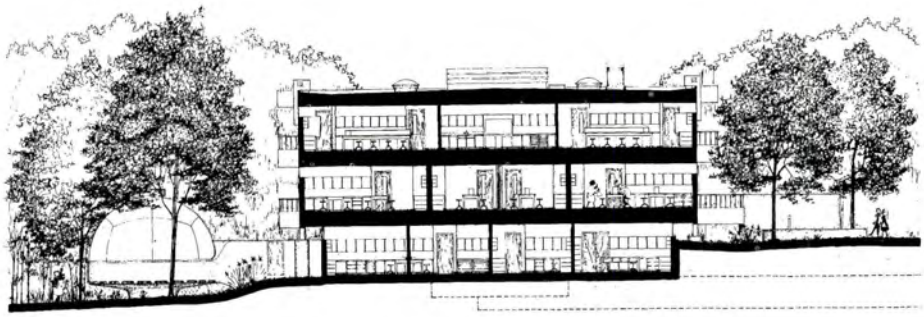


Oxidized metal and glass for crisp precision

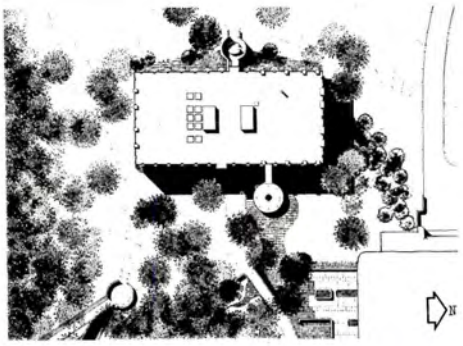
"It appeared from the outset that this college science building should be a sharp, hard building; a structure expressive of the accuracy of the equations, measurements, and formulae of science—and of its ordered procedures. The very nature of science is exacting, and it works with precision and crispness as it ventures into all aspects of the universe. Thus, our choice of materials and details followed logically. Limited corrosion steel was selected for its quality of precision, and because its color and texture relate sympathetically to the rural setting. Similarly, exterior plastic panels, in a related dark color, contribute to the hardness of the design, as does the gray glass—and both plastic and glass create a contrast to the soft character of the natural surroundings. This contrast is further enhanced by the vertical stainless steel exhaust ducts, which serve also as the bold visual expression of a major function of the building."

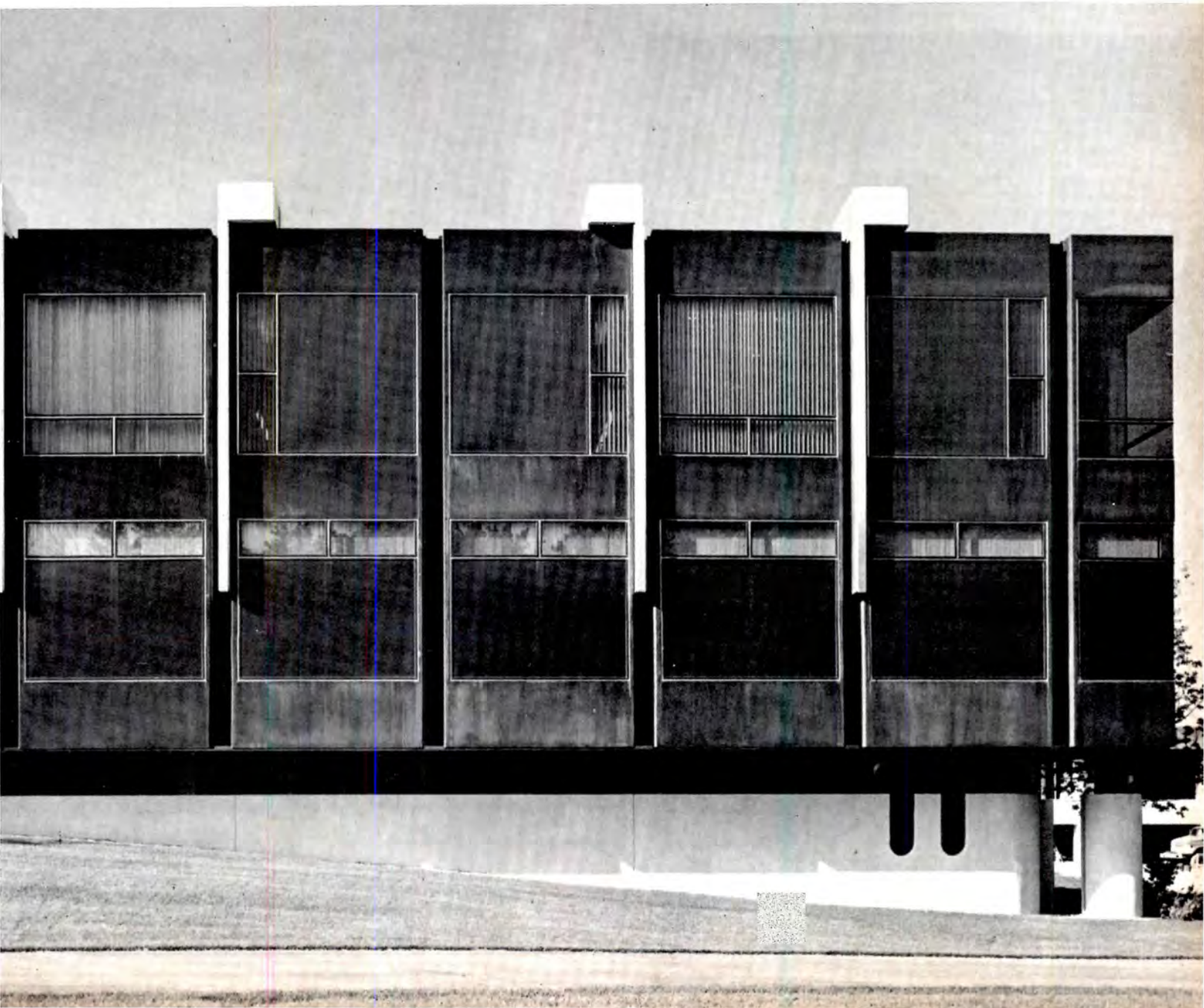
This structure, the first science unit of a new, four-year liberal arts college, was sited within the master plan to relate effectively to present and future academic buildings and the central core of the campus. An article on the master plan and first completed buildings at Grand Valley—designed by architects Meathe, Kessler and site planners Johnson, Johnson & Roy —was published in ARCHITECTURAL RECORD, January 1965, pages 127 to 134.

LOUTIT HALL OF SCIENCE, GRAND VALLEY STATE COLLEGE, ALLENDALE, MICHIGAN. Architects, mechanical and electrical engineering: *Meathe, Kessler and Associates;* structural engineers: *McClurg, McClurg, Mikle & Cooper;* campus planners and landscape architects: *Johnson, Johnson & Roy;* general contractors: *George Datema & Sons.*



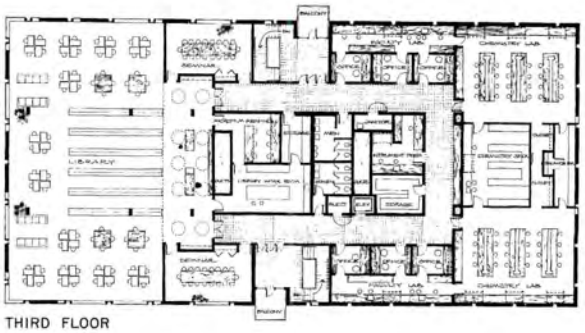
The three-story building is set on a sloping site which affords entrance at second floor level on one side; at first floor level on the opposite side (see section). The circular, glass enclosed conservatory (visible in photo at left) stands free of the building for maximum sun. Its curving silhouette and bubble-like delicacy contrast effectively with the rectangularity and visual solidity of the building's blockiness.



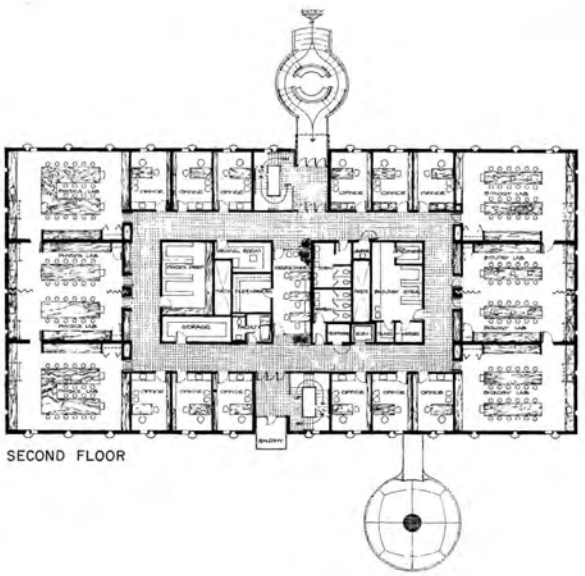


Balthazar Korab photos

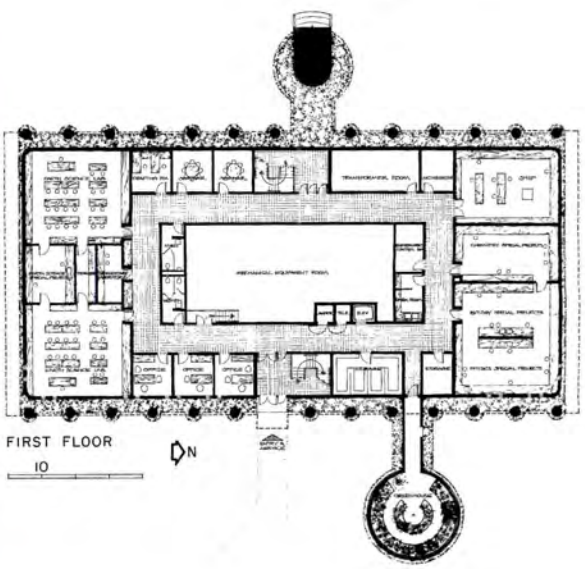
SCIENCE HALL, GRAND VALLEY STATE COLLEGE: The 40,000 square feet of labs and accompanying faculty offices were grouped within the building to achieve unity of subject and interplay of disciplines. The science library is located on the top floor for its impressive views (see photo below). Fume hoods are exhausted through large vertical ducts located on exterior walls and terminated by roof fans; a system that does not upset the central air conditioning, and permits hoods to be removed or added at will. Lab furniture has a natural wood finish.



THIRD FLOOR



SECOND FLOOR



FIRST FLOOR

10

F. W. DODGE CONSTRUCTION OUTLOOK

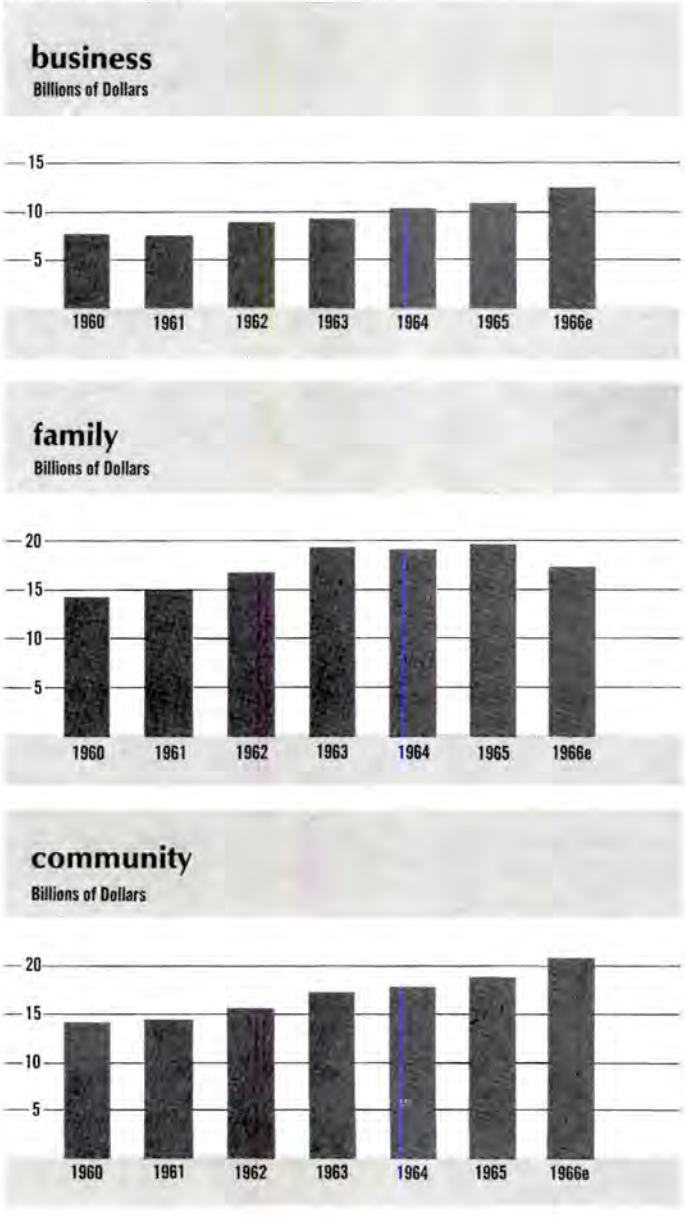
Despite the business slowdown generated by the government's efforts to cool the overheated economy, the F. W. Dodge Construction Outlook for 1967 anticipates a 3 per cent rise in total construction, with all the main building categories showing an increase and only non-building construction a decline.

Of the individual building types, hospitals—up 13 per cent—show the biggest gain over 1966. A detailed analysis of these figures and trends, however, reflects the influence of the tightened economy. Commercial and industrial building, for some time the hottest of all the building markets, will be slowing their rate of growth during the coming year. Apartment building has suffered even more acutely from the effects of economic restraints, but some easing of credit during the latter part of next year is expected to herald a slow revival of the entire housing market. Progress on some public projects is likely to be delayed as a result of anticipated cuts in Federal spending.

Below are excerpts from the Dodge forecast for the year ahead, a service prepared annually by George A. Christie, Chief Economist, of F. W. Dodge Company, a division of McGraw-Hill, Inc.

1967: MORE GROWTH, BUT SLOWER

1 During 1966, gains in non-residential building kept the total construction value from crumbling in the wake of the heavy decline in housing activity. Business-related construction contract value will top $12 billion in 1966—a 14 per cent advance over record 1965. Institutional building and public works are also scoring hefty gains of 10 per cent or better.



As 1966 draws to its close, many of the key economic issues of the year are only beginning to make their full impact felt. New solutions to the problem of our inability to serve all markets at the same time are being tested. With some construction demands already going unmet, the main question of 1967's market is: how much expansion will next year's economic environment permit?

Depending on which part of the construction business you're talking about, 1966 has been either the best year ever, or the worst in almost a decade. In this year of sharp contrasts, the credit-starved housing industry watched its $20-billion market evaporate at the same time that demands for most types of nonresidential buildings were booming to record highs.

After a more or less normal first-quarter rate of close to a million-and-a-half new starts, residential building plummeted to barely a million units by the third quarter. That drop of almost one-third brought housing activity to a level that hadn't been seen since the early part of 1958—and one that nobody ever expected to see again.

It's been the solid nonresidential markets that have provided the support to keep total construction value from crumbling in the wake of the housing collapse.

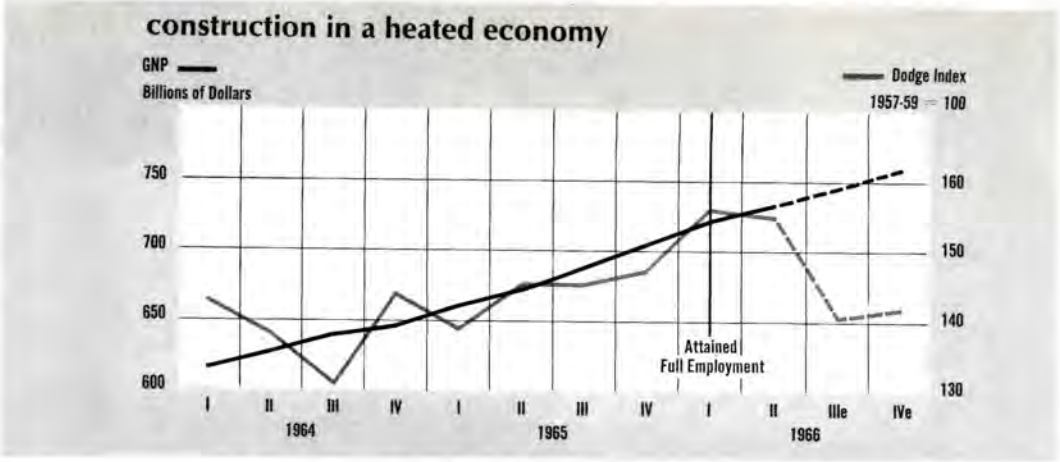
Business-related construction

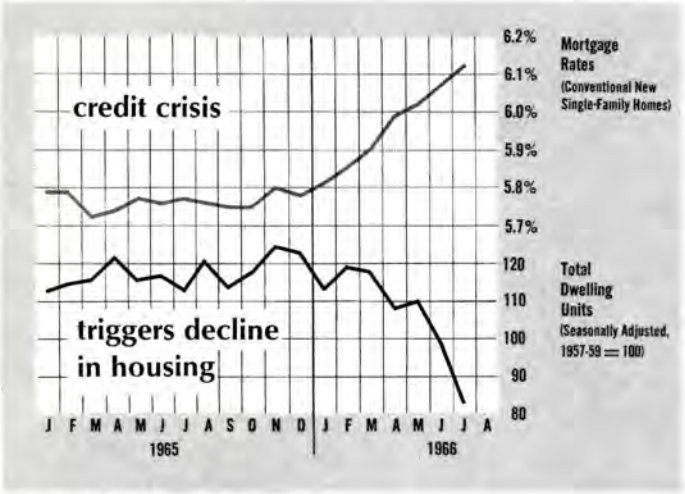
As the current year nears its end, the trend of business-related construction has reached the point where further growth is no longer assured. Many of the encouraging conditions which supported the strong past expansion are still very hard at work, but today there are also a few negative factors which didn't exist as recently as a year ago.

The biggest item on the plus side is that final demands for goods will be growing vigorously all throughout the year ahead, while productive capacity is currently being strained to its limit. New appropriations for capital expenditure were still rising faster than actual investment spending at mid-1966, boosting the backlog even higher. And prices are rising—a trend which usually stimulates investment since it enhances profit.

Heading the list of deterrents to business capital spending

2 What most distinguishes 1966 from previous years is that early in the year we crossed the threshold into *full* employment —and then suddenly just about all construction fell directly under the influence of the capacity of our economic system and the policies that guide it. It is not that demands are less, but rather the economy is straining to meet more demands than it can handle. By the second half of 1966, the overheated state of the economy was noticeably retarding construction contracting. The full year's gain in contract value—about 3 per cent—was made almost entirely during the opening 6 months of the year.





3 Despite a strong and growing need for all types of housing, the tightest credit squeeze since the 1920's has resulted in a continued decline in the housing market in 1966. The increase in mortgage rates is paralleled by a sharp dip in the number of residential projects contracted. Anticipated relaxation of some credit restrictions in the latter half of 1967 should trigger a slow upward trend in all kinds of residential building, particularly single family homes.

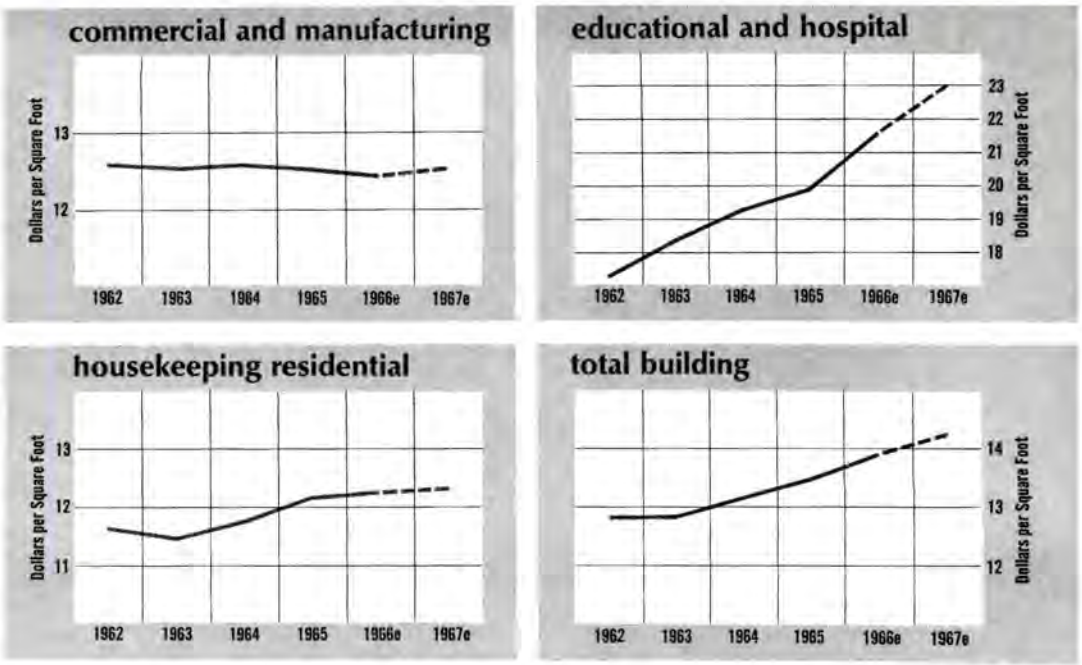
in 1967 is the suspension of the investment tax credit and accelerated depreciation. In contrast to the President's request last spring that business *voluntarily* restrain plant expansion in the interest of holding prices, his September order has some teeth in it. In addition, the general scarcity of investment funds, combined with a slowdown in corporate cash flow is likely to put a damper on business spending next year.

The suspension of accelerated depreciation on newly built industrial and commercial buildings adds another dimension to next year's outlook. The fact that the fast write-off is merely to be suspended during 1967 rather than permanently revoked creates a strong incentive to postpone projects planned for next year until after January 1, 1968. This is, after all, the main intent of the measure. However, it will not affect all business-related construction equally.

The advantage offered by accelerated depreciation diminishes the longer a building is held, and many owners (especially owner-occupants or those who hold properties as long-term investments) do not normally use the fast write-off. Thus a large part of 1967's industrial and commercial construction will be contracted much as planned. The proposed suspension of rapid depreciation is likely to have its greatest effect on speculative building. Within these markets, office building, and to a lesser extent, stores, will be the type that will be moderately inhibited by this change. (The biggest impact of all will fall on residential building. Apartment owners depend heavily on the accelerated depreciation benefit.)

In 1967, the contract value of the entire business-related construction market will be advancing *only* slightly as gains in some categories are offset by declines in others. The individual building types will behave about as follows:

- Manufacturing buildings: up another 6 per cent after last year's solid 15 per cent gain—fully utilized productive capacity continues to be economy's bottleneck.
- Stores and warehouses: though the current housing slump makes recent growth in retail building appear excessive, warehouse needs remain strong—total up only 2 per cent in 1967.
- Office building: expansion likely to be inhibited next year



4 While rising costs of basic construction and increased prices and wage rates in the building trades affect all building, the cost per square foot rate of construction has been rising most sharply in hospital and educational building. In hospital building, this trend reflects vastly more complex design techniques, while in educational building, the rising costs are an indication of the present concentration on development at the university level, where building is most expensive.

by suspension of accelerated depreciation—up 3 per cent.

- Utilities construction: contract value likely to be *down* 15 per cent next year, though still above its long-term trend—decline mostly a reaction to the 1966 gain of better than 50 per cent.

Residential building

By far the most violent reaction to 1966's overheated economic conditions was the collapse of the housing market. In the midst of general prosperity, residential building was suffering nothing short of a depression. Yet, while the evaporation of one-third of that market between March and July served to dramatize the current plight of the homebuilding industry, housing has actually been in trouble for almost three years now. It is as long as that since the residential market has shown a gain.

But while the decline in housing starts has been continuous, the problems have changed. The recent dip in housing activity is a distinctly different situation from the decline that began back in 1964.

In those earlier years, growth in residential building was being inhibited by oversupply—a glut of surplus housing from the West. Currently all regions of the country are affected, and this time it is the direct result of the tightest money squeeze since the 1920s, which has all but dried up the supply of mortgage funds. If mortgage money were available, 1966 needs could easily support a rate of at least 1.5-million units, and probably closer to 1.6 million instead of the barely 1-million rate that prevails in the third quarter.

It is a simple fact that under the present conditions of excess demand, the money market cannot provide enough mortgage funds to get housing output back to a normal level as long as it is also the basic target of anti-inflammatory policy. These two roles are incompatible, as the past six months' experience has clearly shown. If we continue to rely heavily on monetary controls, interest rates will remain very high and money extremely tight all through 1967. And in that climate, housing will remain depressed. On the other hand, if more use is made of fiscal controls to deter demand—specifically, if corporate and personal taxes are raised—it will be possible for the monetary authorities to permit reasonable expansion in the supply of credit. And as this easing takes place, there will be a gradual return flow of funds to the mortgage market and a slow but steady recovery in residential construction through 1967.

- While the availability of mortgage money will control the *amount* of housing built in 1967, the *type* of housing that will come forth will be greatly affected by the recent proposal for temporary suspension of accelerated depreciation.

A large part of today's continuing housing need is being met by reducing the existing supply of vacant rental units. With the marriage rate rising (after a long period of little change) the demand for apartment units will strengthen even more over the year ahead. These market requirements point to a strong growth in apartment building during the latter part of next year, but once depreciation rules are changed, this may not happen.

Since apartment owners—perhaps more than all other building owners—rely heavily on the fast write-off, there will be a strong tendency to postpone a lot of 1967 rental building until after the beginning of 1968. Thus, the mix of housing started in 1967 is likely to consist of a larger-than-normal proportion of single family homes.

While a bit more mortgage money will be forthcoming next year, credit will continue to be scarce, and the improvement in housing output will be small, at best. In terms of housing *units*, the credit squeeze of 1966 precipitated a drop of 15 per cent from the level of the year before; 1967's recovery—coming late in the year and inhibited by the depreciation ruling—is likely to recapture just a small part of that loss. But while dwelling units will be up only 2 per cent in 1967, a higher proportion of single family homes in the year's total will boost residential building value by about 5 per cent.

Construction of community facilities

During the past year, the several recently enacted Great Society programs have begun to have profound effects on many of the project types included in this group. Medicare helped to stimulate a 17 per cent increase in contracts for hospitals and other health facilities; aid to higher education under several pro-

grams has backed an 18 per cent advance in school construction; the Appalachia program was largely responsible for an unusually large 21 per cent gain in highway contracts.

While fiscal 1967 appropriations were not yet set as this forecast went to press, there is little doubt that Congress will be doing some cutting in response to the President's order for budgetary restraint. A $3-billion reduction in government spending is being sought to ease inflationary pressures, and most of it will have to come from Federally financed construction. As a result, some public programs will be stretched out despite pressing needs for such facilities. Compared with the 1966 gain of 12 per cent for all community-oriented construction, 1967 will show only a 2½ per cent advance in contract value. And most of that will represent increased costs, not physical volume.

- Educational building: Two very strong building years in a row have raised the annual value of educational construction by more than one third since 1964. By far the largest part of this huge expansion represents the preparation of the nation's colleges and universities to accommodate the huge growth in enrollments that was so clearly foreseen.

5 Contrary to some gloomy predictions of the effects of the tightened economy, building construction shows an over-all 3 per cent gain in 1967, with only nonbuilding construction showing an actual decline. Of the individual building types, hospitals show the biggest advance—up 13 per cent over 1966. Religious buildings—down 3 per cent—are the only building type to decline in 1967.

	1966 preliminary*	1967 estimated	PER CENT CHANGE
NONRESIDENTIAL BUILDINGS			
Commercial	$ 5,900	$ 6,050	+ 3%
Manufacturing	3,525	3,750	+ 6
Educational	4,900	4,950	+ 1
Hospital	1,775	2,000	+13
Public	800	850	+ 6
Religious	800	775	− 3
Recreational	800	850	+ 6
Miscellaneous	675	675	−
TOTAL	**$19,175**	**$19,900**	**+ 4%**
RESIDENTIAL BUILDINGS			
One and Two Family	$13,100	$13,800	+ 5%
Apartments	4,150	4,250	+ 2
Nonhousekeeping	1,500	1,600	+ 7
TOTAL	**$18,750**	**$19,650**	**+ 5%**
TOTAL BUILDINGS	**$37,925**	**$39,550**	**+ 4%**
NONBUILDING CONSTRUCTION			
Streets, Highways and Bridges	$ 6,450	$ 6,700	+ 4%
Utilities	1,800	1,525	−15
Sewer and Water	1,675	1,600	− 4
Other Nonbuilding Construction	2,675	2,600	− 3
TOTAL	**$12,600**	**$12,425**	**− 1%**
TOTAL CONSTRUCTION	**$ 50,525**	**$ 51,975**	**+ 3%**
DODGE INDEX (1957-59 = 100)	**146.4**	**151**	

*Eight months actual; four months estimated

A noticeable slowing must be expected in the trend of school building next year, however. At the elementary and secondary levels the gain in enrollments will be smaller. And in 1966's difficult bond market, the sale of public school issues declined while Federal money was proving harder to get. Continued expansion in higher educational building will offset these weaknesses, but only a small gain in contract value is indicated.

- Hospital and health facilities: With the backing of four Federal programs (with combined authorizations for construction of over $4 billion for fiscal 1966) as well as the indirect stimulus of Medicare, hospital building took a first big step toward another period of strong expansion last year.

While these same programs carry authorizations for an additional billion dollars of construction money (25 per cent more than last year) for the fiscal year 1967, it is unlikely that Congress will appropriate all of it. Even so, a better-than-10 per cent advance in contract value is within reason.

- Highways: Sharply rising construction costs required a step-up in highway spending everywhere during 1966, but the new Appalachian development program brought hefty gains (as much as 30 per cent at mid-year) in the 10-state area it benefits.

Costs of the huge Interstate project are rising faster now than the contributions to the Highway Trust Fund which supports it, and a several-hundred-million-dollar Congressional supplement will be needed next year if the schedule is to be kept. This is not likely to come through, however.

In 1967, Appalachia will lend steady support to road-building totals, but unlike last year, it will not represent a plus. Rising costs will be the main factor leading to a moderately high total highway contract value in 1967.

- Sewer and water projects: Although the need for pollution control is drawing increasing national attention, construction work in this area is still lagging as municipalities wait to see what kind and how much Federal aid will become available. Water supply contracts on the other hand, are still showing solid growth—most of it in the West. Next year's outlook is for more of the same.

The rising costs of construction

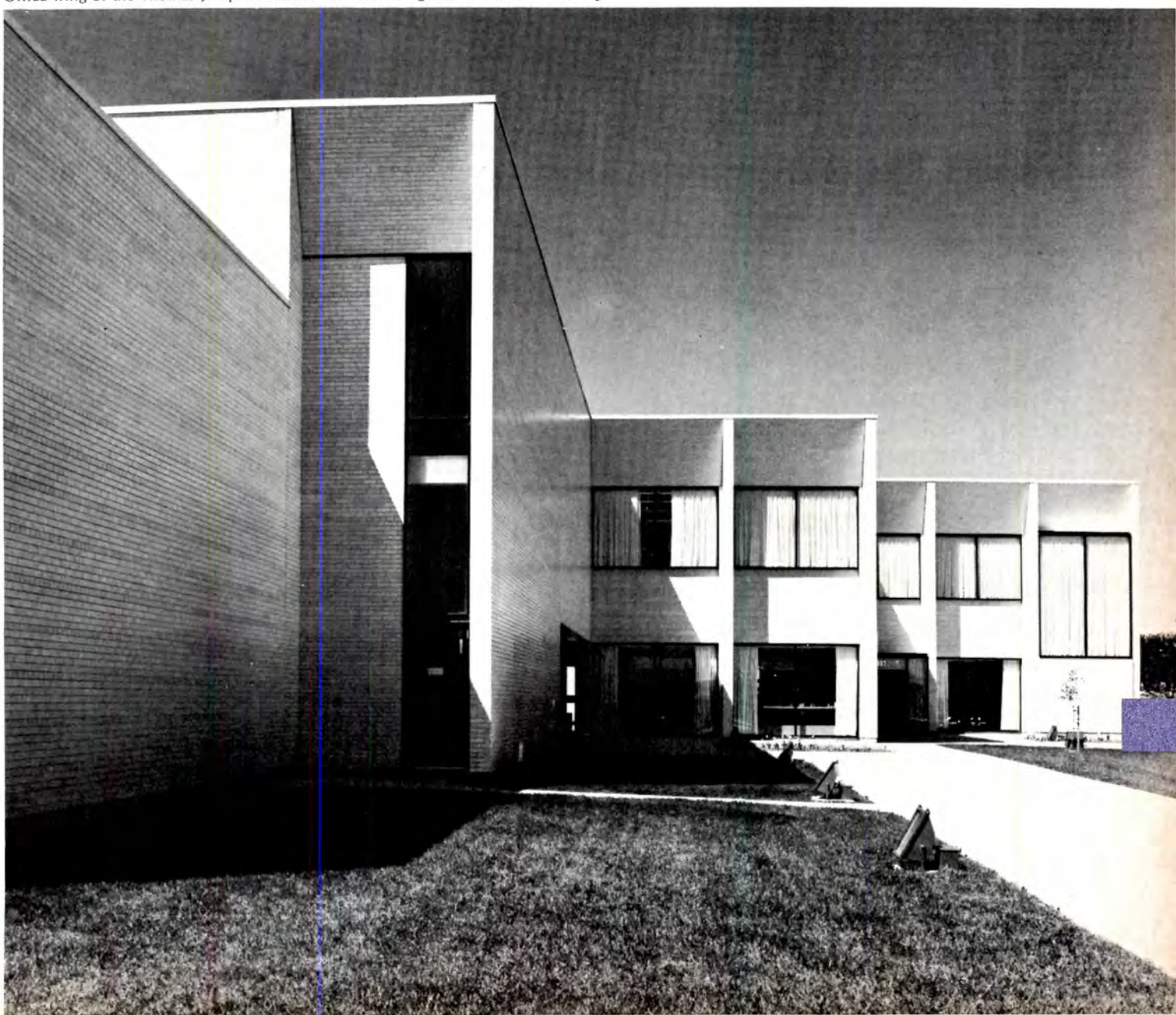
At the halfway mark in 1966, the contract value of new building projects stood 7 per cent ahead of the comparable year-ago total, but the physical volume of building—measured in square feet of floor area—had advanced only half as much. And while the rate of building has slowed somewhat during the third quarter, the same relationship between value and square feet is still evident.

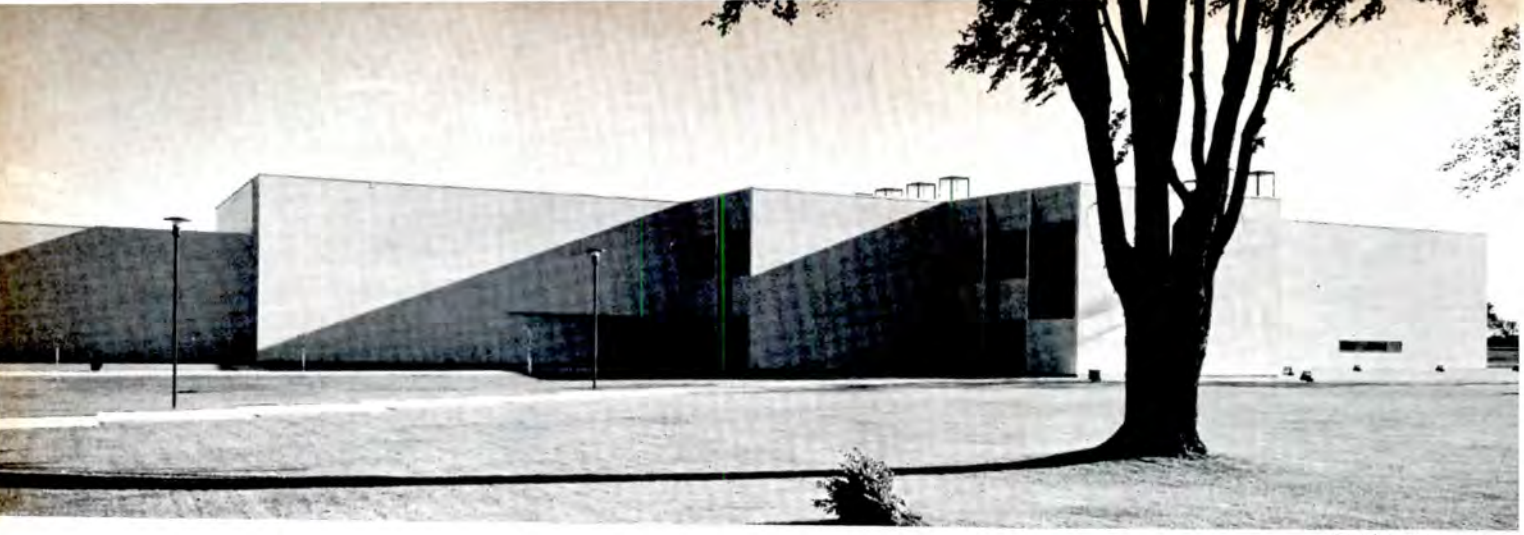
Basic construction materials, prices and wage rates in the building trades are costs that affect *all* building, and these costs have been moving up faster in 1966. Yet in addition to price changes, important *real* changes are taking place as well. To get some indication of the improvements in construction itself—better structural design, use of higher-grade materials, installation of more built-in equipment—it is necessary to look at the cost patterns of individual building types to see where the changes are taking place.

The fastest-rising cost per square foot trends are found in the institutional group—principally hospitals and schools. Hospitals have become vastly more complex in design in recent years, while almost all of the growth in educational building is taking place at the university level where the most expensive building is done. These trends will continue into 1967.

Four small industrial plants, simple in concept, and designed with a skilled restraint

Office wing of the Thomas J. Lipton Limited manufacturing and warehouse building





David G. Harris photos

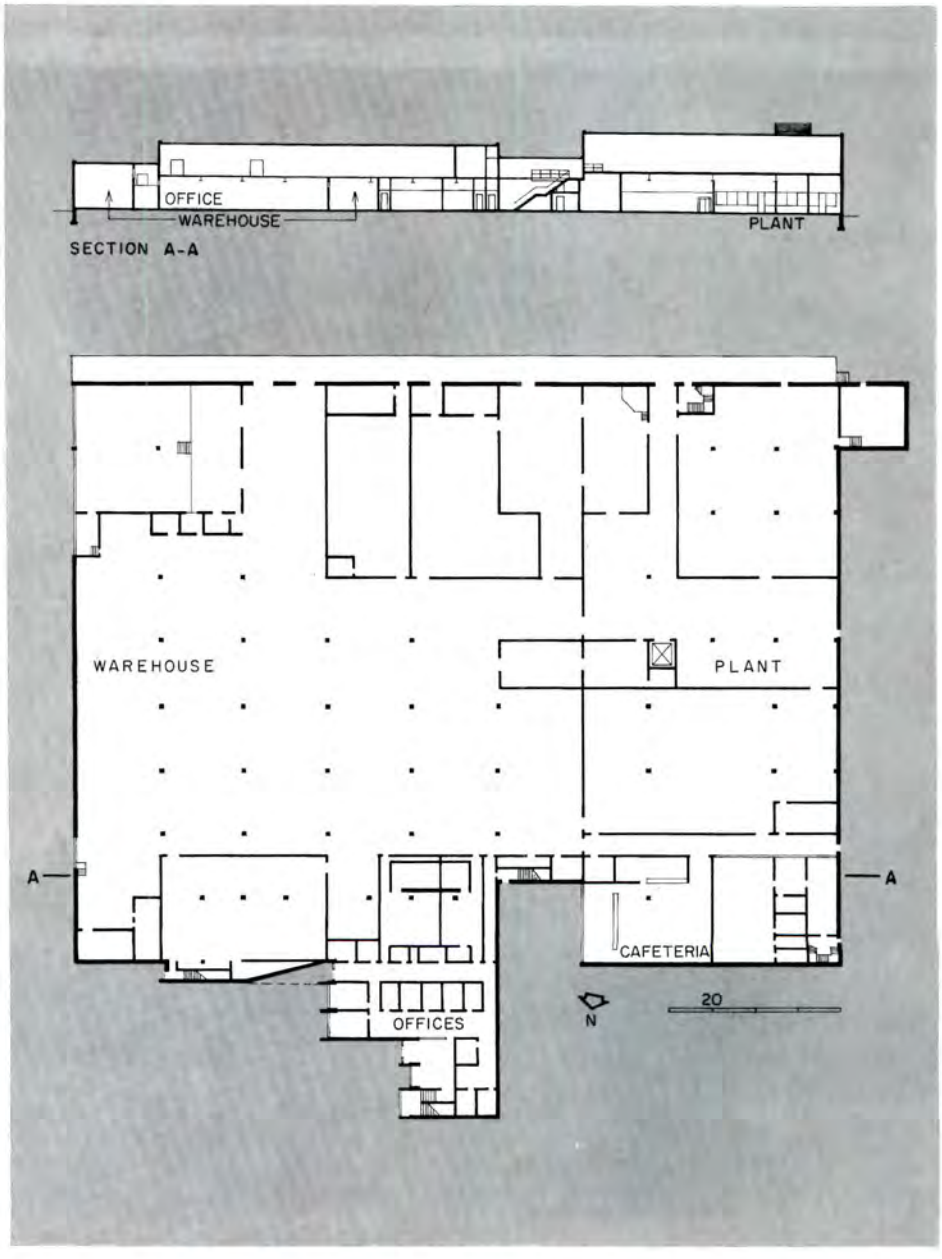
Plant and Offices for Thomas J. Lipton Limited, Bramalea, Ontario

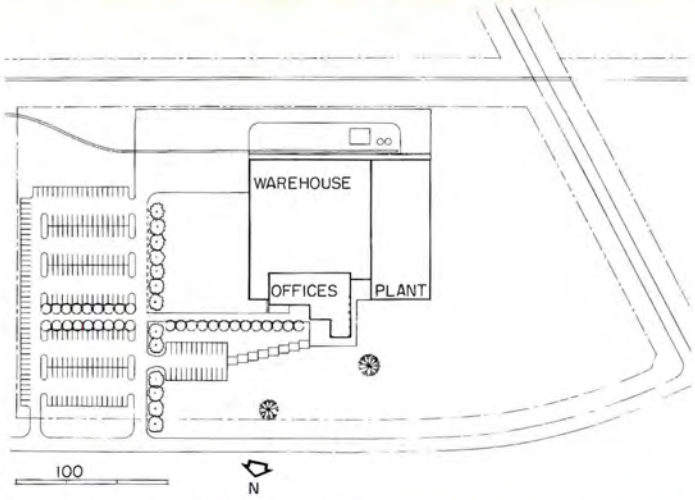
If the separate functions of manufacture, warehousing and administration are combined in a single industrial plant, and each is given appropriate architectural expression, the result in the hands of a skilled architect can be as successful as this design by John B. Parkin Associates for Lipton's, the well known makers of teas and soups. As the photograph above and the plot plan at the far right indicate, the architects have organized the three basic elements to achieve a strong and handsome contrast between the administration wing with its well articulated staff and visitors' entrances and the large windows on the northeast facade, and the industrial and warehousing elements with their uninterrupted windowless walls.

The architects believe that their choice of white brick throughout has made the exterior walls appear less oppressive and heavy than broad uninterrupted expanses of wall would otherwise look. The white brick is flecked with black which is repeated in the black painted steel window frames and sash. Above the secondary entrances the black steel panels extend to the roof. Twelve prism skylights, also accented by black frames, introduce natural light into the second floor of the general office area.

The structural system consists of a welded steel frame on caisson piles with reinforced concrete floors. The frame is erected on a 30-by-40-foot module in the warehouse and a 30-by-30-foot module in the plant. The roof is constructed of precast concrete slabs used in combination with a steel deck and built-up roof.

Architects and engineers: *John B. Parkin Associates;* general contractor: *Redfern Construction Company Limited.*




WAREHOUSE
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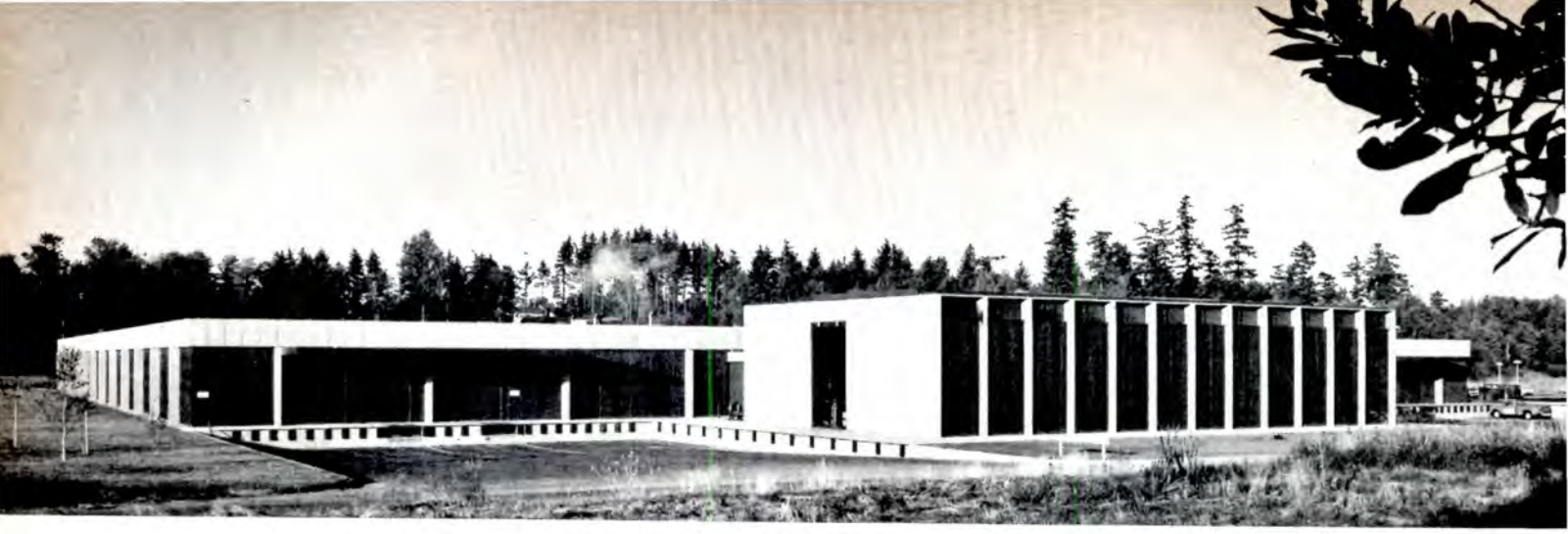
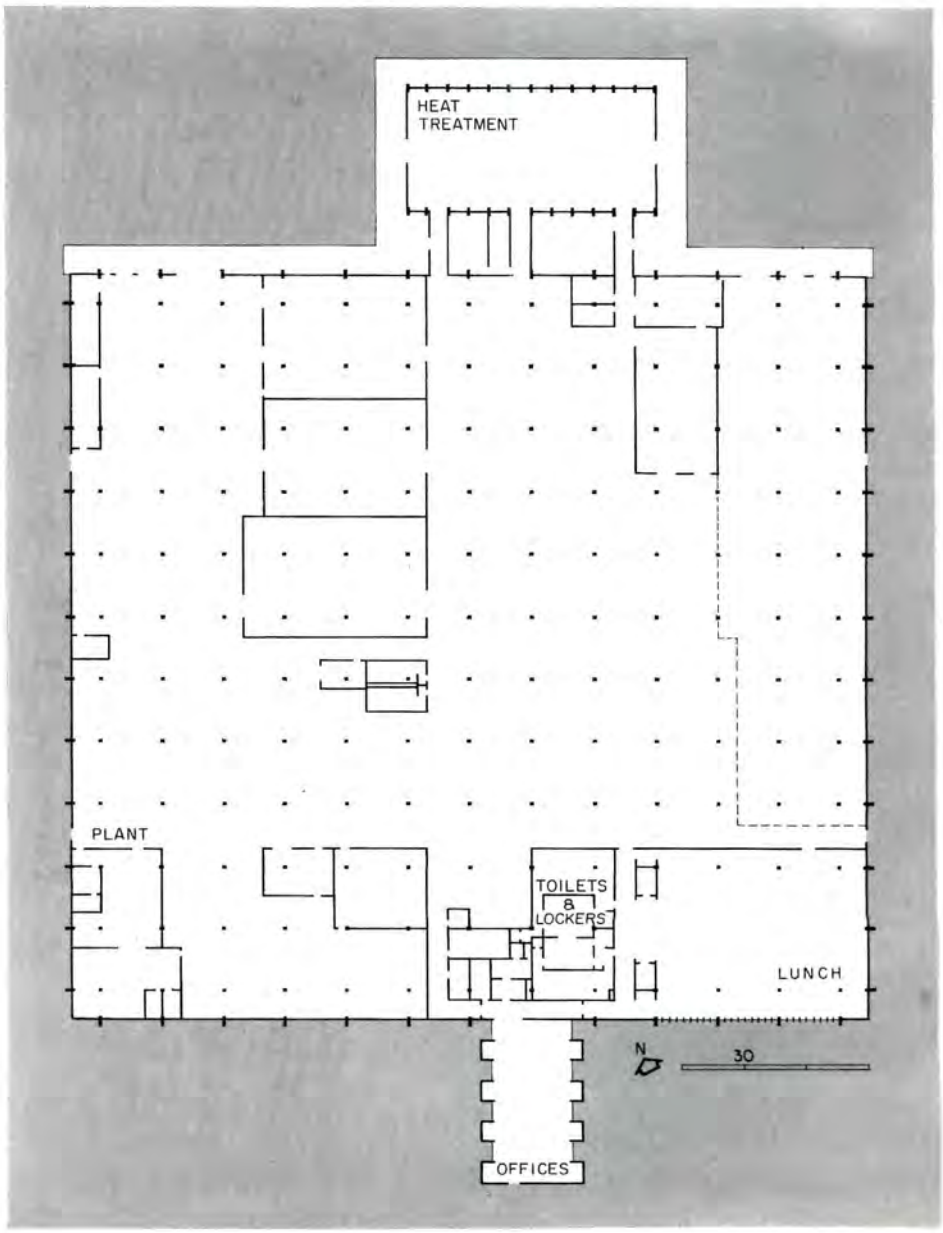


Edmund Y. Lee photos

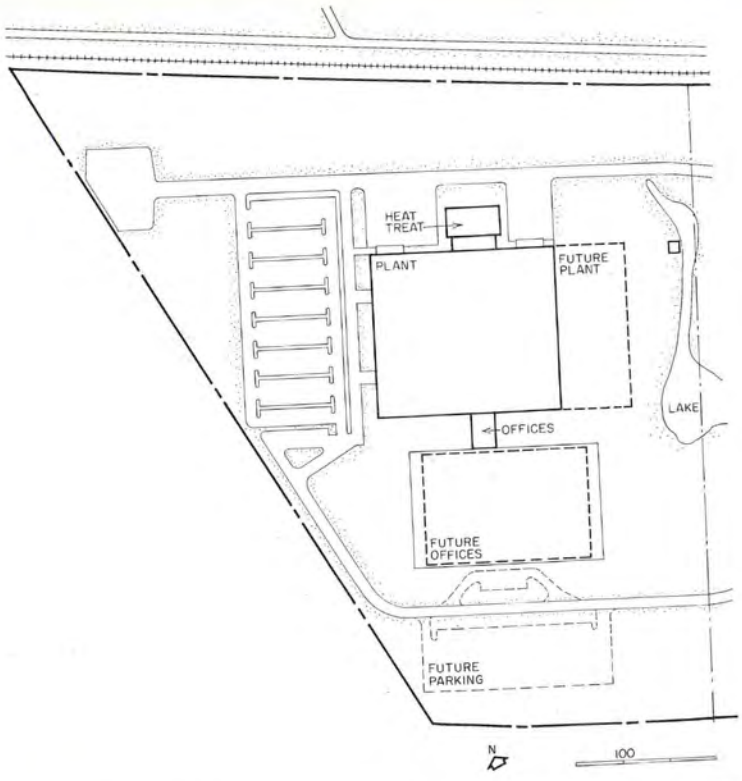
A Manufacturing Facility for Omark Industries Incorporated, Milwaukie, Oregon

This factory, which produces cutting and fastening products for the building trades, presents a good appearance from all angles, including the rear. This view, with its well planned loading dock and truck apron, is shown in the photograph above. The new plant will look even better in the future, when the entire scheme by the Portland office of Skidmore, Owings & Merrill is finished. The smaller linking element, shown at right, which now contains offices, will eventually connect the manufacturing facilities with the new office wing.

The linking element is framed by 10-inch by 3-foot-6-inch reinforced concrete columns which support a roof and clerestory. The non-bearing walls between the columns consist of 6-inch-thick reinforced concrete tilt-up panels. The wall structure of the manufacturing plant is similar, consisting of 1-foot by 4-foot reinforced concrete columns positioned on 30-foot centers with 6-inch-thick reinforced concrete tilt-up panels located between them. These panels are covered with a board and batten veneer of native Oregon wood, cut with tools of Omark's own manufacture. Even the heat treatment plant in the foreground of the photograph above has this wood veneer. As a result the elevations do not express the factory's fireproof construction, as those architects at SOM who believe in a stricter functionalism would argue they should, but the striated wood veneer does give the building a warmth and refinement of scale not often found in industrial plants.



Architects and engineers: *Skidmore, Owings & Merrill;* engineer: *Cooper & Rose;* general contractor: *Juhr & Sons, Oregon Ltd.*


HEAT TREAT
PLANT
FUTURE PLANT
LAKE
OFFICES
FUTURE OFFICES
FUTURE PARKING
N
100

Pietinen photos

A Printing Plant for Weilin & Göös, Tapiola, Finland

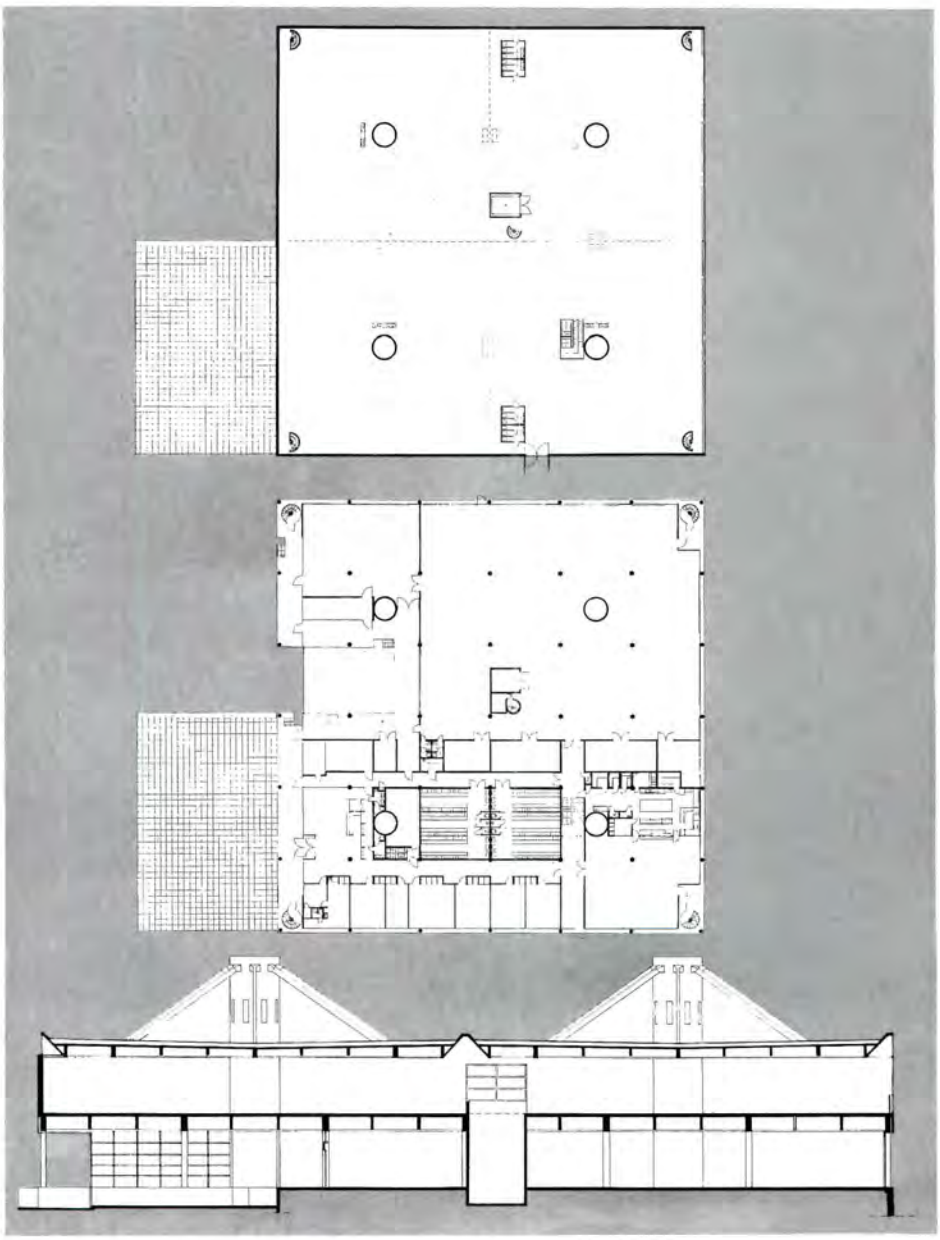
Finnish architect Aarno Ruusuvuori and his compatriot, structural engineer Bertel Ekengren, have devised a unique structural system for a two-story printing plant which has been built in the light industrial area of Tapiola. Because the printing process, like many other industrial techniques, functions best in large column-free spaces, the designers have created four such spaces out of identical forms which can be repeated indefinitely.

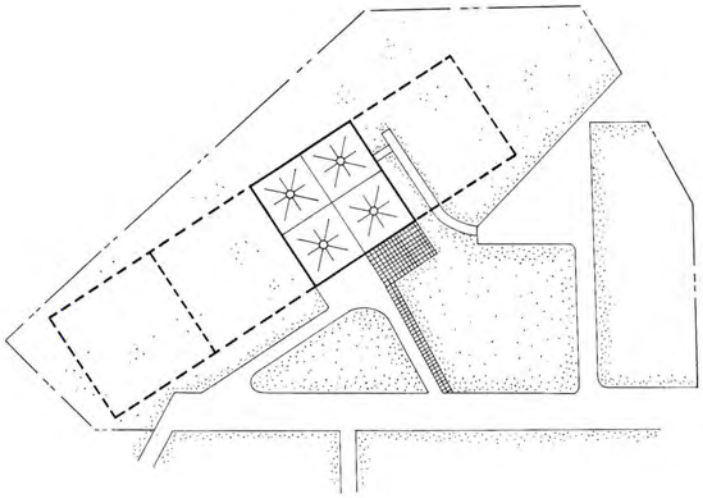
This basic form comprises a two-level area approximately 80 feet square. The intermediate level or plane which serves as the main plant floor, with warehousing below, spans nine structural bays approximately 27 feet square, and contributes to the rigidity of the central tower or mast from which the roof is suspended. The tower is a hollow core which contains an individual heating and ventilating plant and the necessary risers leading to the horizontal duct work.

At the top of the tower eight concrete arms, each functioning as the diagonal tension member of a simple cantilever truss, support the four principal girders at mid-span, and at the four corners where they intersect.

As the site plan shows, the owners foresee three additional growth phases in which they plan to add 12 more of these basic units in groups of four each.

Since direct sunshine is undesirable in a printing plant because of its effect on paper and print, glass areas are kept to a minimum strip at the cornice line for all but one exposure and are shielded by deep overhangs on the lower floor. The northwest facade consists entirely of glass, to afford the workers a view of the open forest and rock outcroppings.





Gordon H. Schenck, Jr.

Equipment Building, Southern Bell Telephone & Telegraph, Canton, N.C.

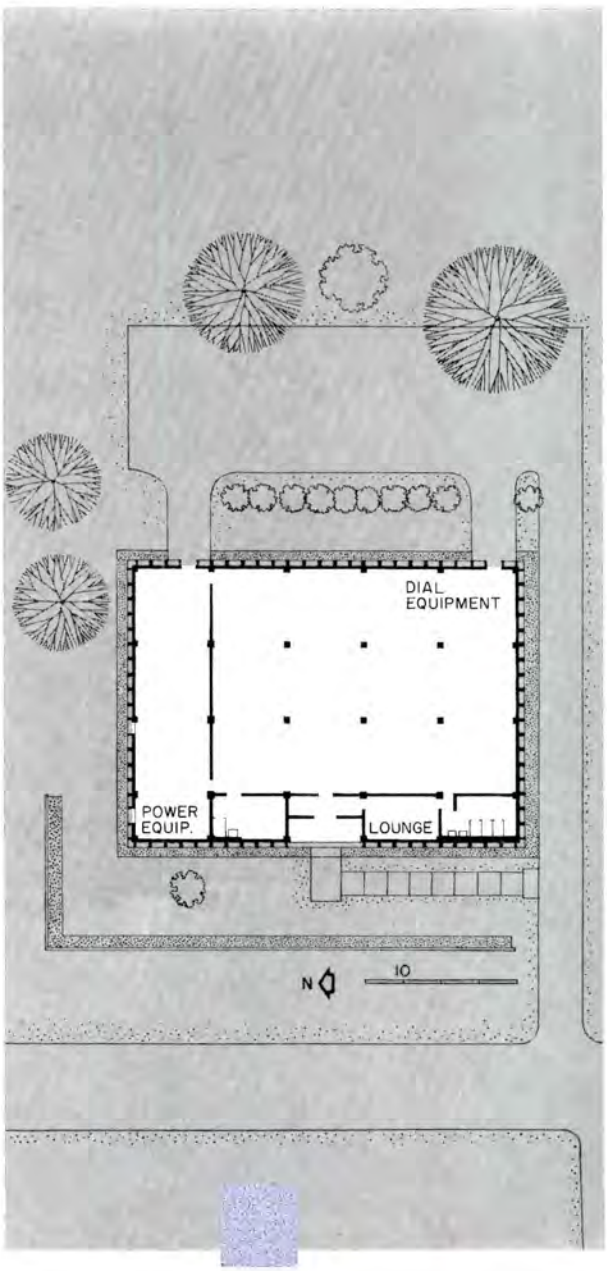
The client required approximately 8,000 square feet of enclosed space to contain the equipment, and the small staff necessary for complete telephone service for the town.

The architects designed a simple structure surrounded by a retaining wall on a steeply sloping site generously furnished with ground cover to prevent erosion. The building is located in an area zoned for heavy industry and is adjacent to several large factories. Its modest, straightforward expression is in keeping with these surroundings. At a construction cost of $149,413, the designers provided a structural system which consists of a floor slab on grade combined with a poured-in-place concrete frame and a flat slab roof. The interior partitions are nonbearing and are constructed of concrete block.

The exterior walls consist of hollow tapered precast concrete panels with a trowelled aggregate surface contrasting effectively with the smooth dark painted finish of the structural frame.

The structure is windowless because the delicate equipment it contains requires close humidity control. A completely automatic air-conditioning system has been provided and is located in the mechanical equipment penthouse on the roof.

As the site plan indicates, a visitors' entrance faces the street and the staff entrances are at the rear, immediately adjacent to the parking lot. The lounge area was specially engineered for use as a fallout shelter.



Architects and engineers: *J. N. Pease, Associates Architects, Engineers & Planners;* general contractor: *C. P. Street Construction Company.*

THE CHANGING ROLE OF THE **OFFICE BUILDING**

A NEW CONTEXT FOR THE OFFICE TOWER Three multiple-use developments by Skidmore, Owings and Merrill make office space an integral part of building complexes that include parking, hotels and retail shops.

OFFICE DESIGNS THAT BREAK THE PATTERN Despite the similarity of many recent office designs, there are other circulation patterns, and structures, that are appropriate under certain conditions.

THE OFFICE BUILDING AND URBAN RENEWAL The urban renewal process tends to create a series of fixed conditions before the office tower is designed. If the architect participates at an earlier stage, a new type of building may result.

Three multi-use complexes by Skidmore Owings and Merrill: 1. The Main Place development in Dallas, shown in detail on pages 162-165. 2. Carlton Centre in Johannesburg, South Africa, shown on pages 166-167. 3. Eaton Centre in Toronto, shown on pages 168-170.

1. *Ezra Stoller*

A NEW CONTEXT FOR THE OFFICE TOWER

Larger building sites and more intensive use of land are changing the context in which office buildings are designed. The renewal of downtown areas, with or without government funds, seems to be producing a new pattern of development. This pattern can be seen at Charles Center in Baltimore, Marina City in Chicago, or the Prudential Center in Boston—and in smaller cities like Hartford or Akron. It involves combining office buildings with parking, retail stores, hotels and even apartments. The John Hancock Center in Chicago, designed by Skidmore, Owings and Merrill, actually puts most of these elements into a single 100-story building, but, for the purposes of this discussion, such intensive land use represents the extreme case.

The three other complexes by Skidmore, Owings and Merrill that are pictured above, and which are shown in detail on the following pages, serve as a clear example of a new trend. Main Place in Dallas, The Carlton Center in Johannesburg, South Africa, and Eaton Centre in Toronto are all financed by private enterprise, but required special cooperation from municipal authorities. They all combine large plazas and open space with the most intensive possible development, in which varied land uses are connected by a concourse system.

2 + 2 = at least 5

The obvious basic principle of retail location has always been to place a store where it would be in the path of as many potential customers as possible. Office buildings draw large numbers of people both as workers and as visitors. The seemingly inevitable result, to use the words of David S. Owen, now the managing director of Eaton Centre and formerly a vice president of the corporation that developed Main Place, ". . . shopping centers began adding office buildings and office buildings began adding retail space." From this simple principle comes the multi-use complex with its parking for shoppers and office workers by day, and for the theater and hotel by night. Such a complex requires the creation of superblocks, and superblocks,

2.

3.

under most zoning ordinances, permit office buildings with larger office floors, which are what the tenants who can pay the premium rents seem to want. Apparently these firms are growing faster than their computers, or their efficiency experts, can cut them down to size. The whole package is thus self-reinforcing, with the multiple use helping to make the creation of larger parcels of land more economic, and the larger parcels in turn permitting the creation of the kind of buildings that seem to do best in today's rental market.

The key to multi-use is the lower level

Visionary renderings of the city of the future never used to be complete without helicopters hovering in the middle distance and long perspectives of overhead walkways, crowded with pedestrians. Time has taught us that helicopters make noisy neighbors and that pedestrians have a considerable resistance to overhead walks. On the other hand, the underground concourse at Rockefeller Center, which everyone had taken for granted, pointed in a new and very useful direction. Pedestrians might resist walking to an upper level, but they could be lured down, particularly if the trip were on the way to transportation or a parking space. At Main Place, and later in the other two developments, Skidmore, Owings and Merrill have opened up large courtyards which, in effect, make grade level into an overhead walkway, by placing a new level of shops below. Passers-by can look down into well-lit courts, complete with planting and fountains, rather than be confronted by the wall of a parking garage that supports an upper level concourse.

Multiple use improves investment quality

To quote David Owen again: "Instead of going out to look for the 100 per cent corner, you can build it into your project—permanently." An office building tied to commercial development and backed up by adequate parking is that much less likely to find itself left behind by a migrating business district.

A complex of sheltered pedestrian walkways is an asset in both warm climates and cold, the convenience of near-by shops and restaurants is always valued. The older urban cores had much of this built-in convenience as a matter of course. A club or a little restaurant was always right around the corner and there was little point in trying to provide for them within the office building itself. But the automobile, the increase in the size of cities, and the scale at which enterprises are economic in today's society all tend to break down the existing patterns, so that, in many cities, the old convenient relationships have been lost. These relationships inherent in the existing fabric of the city were hidden assets—the developers probably never noted their existence until they disappeared; but today, in many areas, an office building can only offer true central business district convenience as a part of a multiple-use complex.

Cooperation by cities is essential to multiple use

The creation of superblocks means the closing of streets, and pedestrian precincts below grade require underground servicing and the displacement of utilities. In addition, multiple-use structures frequently go against existing zoning ordinances, written to correct old abuses without envisaging new possibilities. For all these reasons, the active cooperation of the city government is essential to the developer, even if no government help is forthcoming in assembling the land. Few cities are against accepting developments at this scale, but some are so bound by existing ordinances that it is extremely difficult for them to act. In any event, the design of office buildings for such a complex is likely to involve the architect far more in the intricacies of the city fabric than was likely in the design of a single-purpose building on a relatively restricted site, which should be a welcome development. Undoubtedly the movement of office buildings to outlying locations will be with us for a long time to come, but the trend towards the multiple-use complex represents an enrichment of urban life.

MULTI-LEVEL CONCOURSE CONNECTS MULTIPLE USES

The office tower at One Main Place in Dallas is the latest in an ever-more-refined sequence of buildings whose exterior wall and structure are one and the same. Its real novelty, however, lies in its context, and in the role of the building as the first unit in a multiple-use complex.

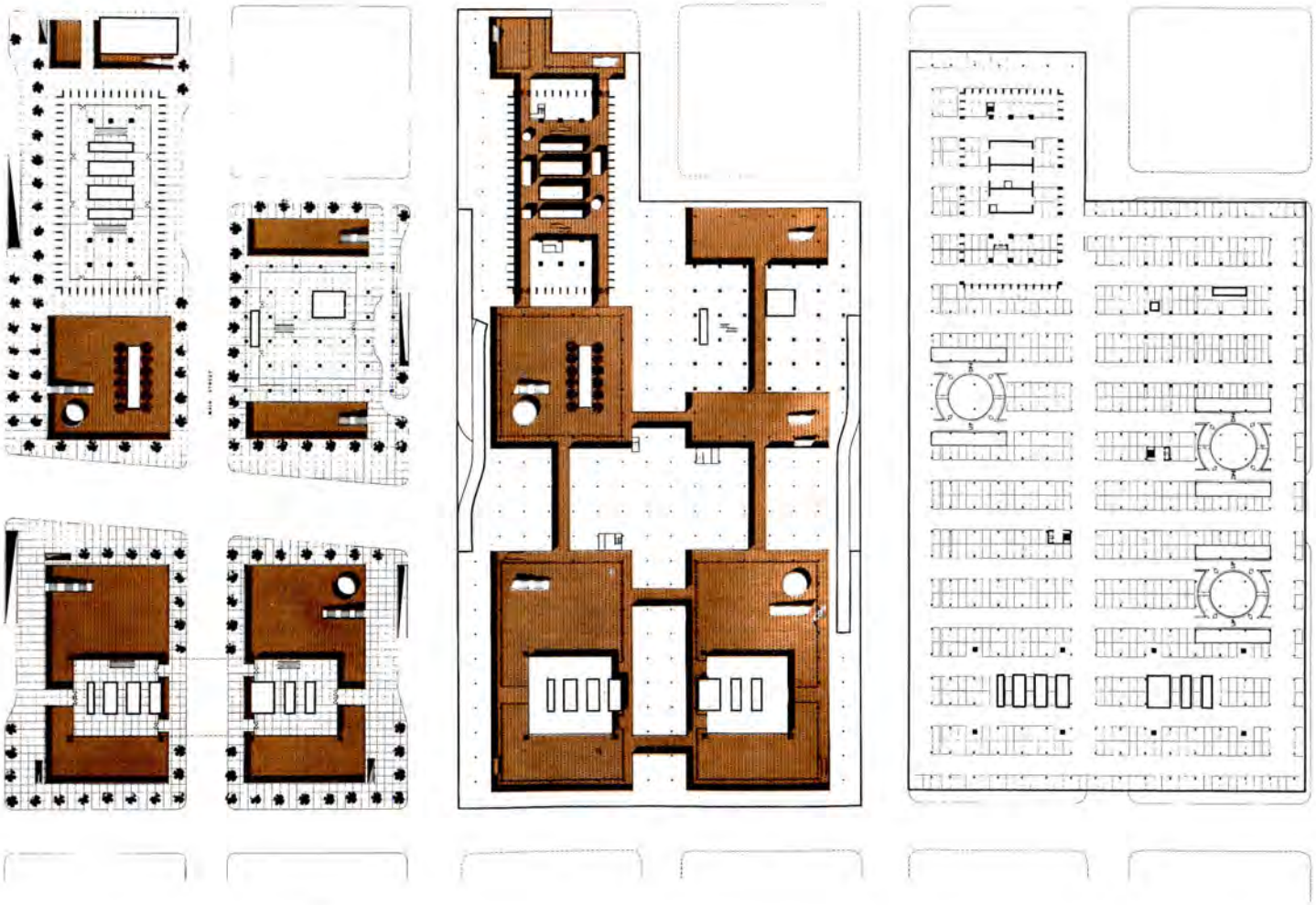
The entire redevelopment project will cover 10 acres in downtown Dallas, and its somewhat staggering statistics are that it will ultimately include 2.4 million square feet of office space, a 300,000-square-foot department store, a 400-room hotel, 225,000 square feet of retail

shops and a 3,500-car parking garage. The total construction cost will be in the neighborhood of $120 million; with the whole project privately financed.

The first-stage building will contain two-fifths of the office space, a quarter of the retailing facilities (which will surround a large plaza located a story below grade) and about a quarter of the parking places.

The concept grew out of a concern by local businessmen for the future of the older part of the Dallas business district. In 1960 representatives of the Central Business District Association approached Charles Colbert, then dean of the Columbia University School of Architecture, with the proposal that Columbia students do a feasibility study of redeveloping the area through private enterprise. The study was duly carried out and publicized, and some of the same business leaders set about acquiring 10 acres of land within the study area. Acquisition was completed in 1964, and Skidmore Owings and Merrill, along with the Dallas firm of Harwood K. Smith & Partners, were retained as the architects.

The key to the design is actually an intricate underground service, parking and concourse system. Traffic from the new downtown freeway loop will be able to drive almost directly into the garage. Truck service will be by a tunnel under Main Street. A pedestrian concourse will connect the garage with courtyards 15 feet below grade, which are surrounded by shops; the concourse will also connect with the lower lobbies of the office buildings and the hotel, so that pedestrians will be able to traverse the entire project at the concourse level.

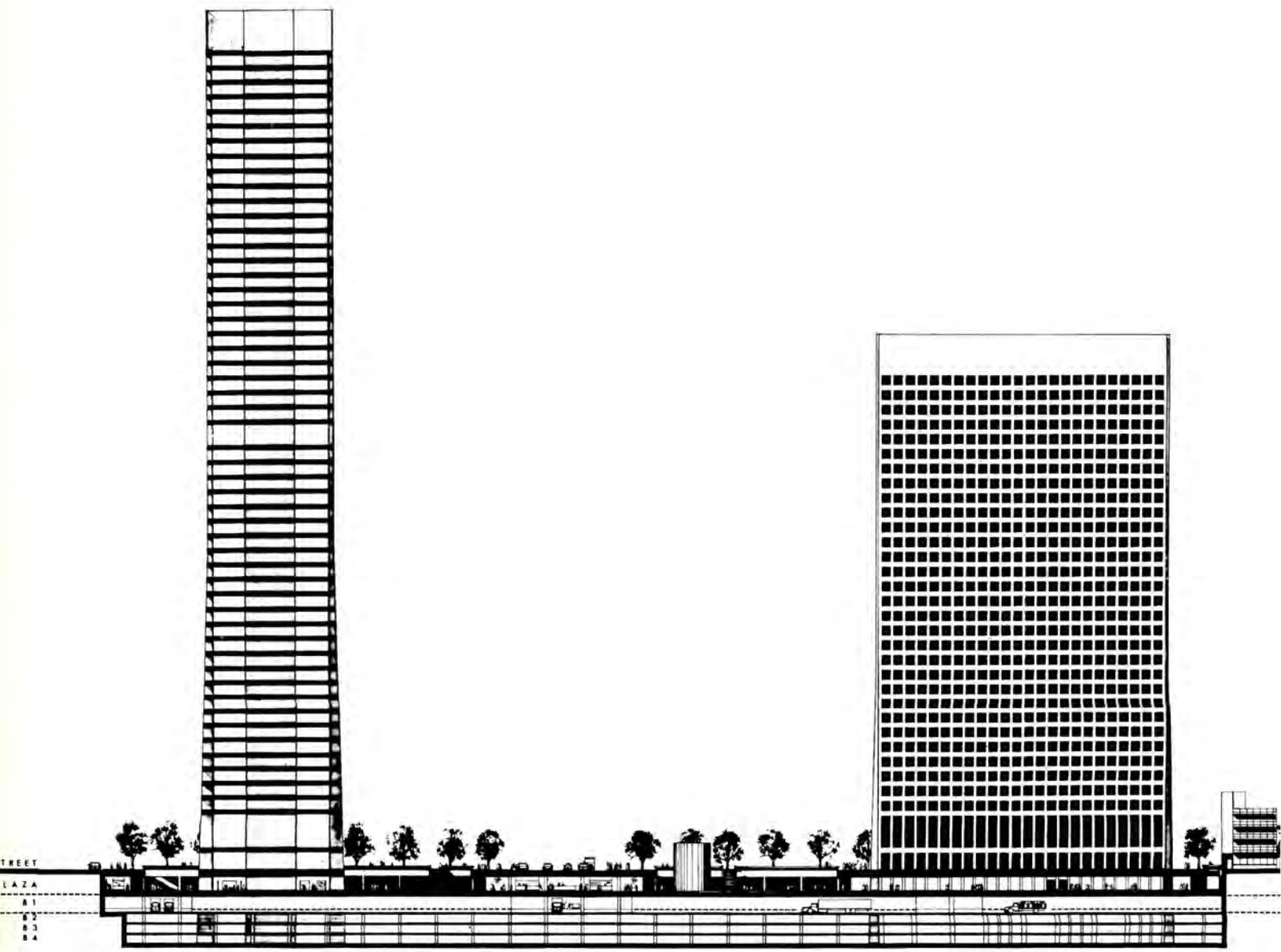


The first stage of the Main Place development is shown in the top left-hand corner of the plans above. It is now under construction, and will set the pattern for all the major features of the project. A lower-level concourse lit by large open courtyards (center drawing) will connect all buildings, and provide a large quantity of rental space. Services and parking will be at additional below-grade levels (drawing at right). The second office tower will span across Main Street, and will be divided into an upper and a lower building with separate lobbies on either side of the street. This division will permit two major tenants to have their names identified with the building, instead of only one. A hotel and a department store will complete the project. Note that access to the parking garage is achieved by cutting an extra traffic lane out of the site, to minimize the congestion that might be caused by automobiles waiting to get into the garage.

The second-stage office tower will in fact be two separate buildings, one atop the other, but separated by their mechanical floors. This double building will span Main Street by means of a giant truss, and the lobby for the lower segment will be on one side of the street, with the second lobby on the other. This duality will permit the names of two major tenants to be identified with the building.

Both the first-stage building, which is now under construction, and the double building, which is scheduled for completion in 1969, will have tenant floors far larger than has been customary in Dallas. The developer of Main Place surveyed the Dallas rental market and found that more than half of the total rental space in downtown Dallas is occupied by tenants requiring more than 12,000 square feet per floor. Needless to say, these larger tenants are the ones that tend to be most willing and able to take space in a premium-rent building. As a result, the floor area at One Main Place is almost 30,000 square feet, allowing large tenants to be housed in a smaller number of floors, which reduces their inter-floor traffic and the duplication of various services.

One Main Place (34 stories and 450 feet high) will be a reinforced concrete structure in which the columns will be both the exterior wall and the exterior frame. Each column tapers from approximately 2 by 8 feet at the base to 2 by 3 feet at the top. There is a spandrel beam at every story, and sheets of gray-tinted glass, 8 feet wide, are the only infill panel. At street level there will be a large open area with elevators and escalators leading up to a monumental bank lobby.

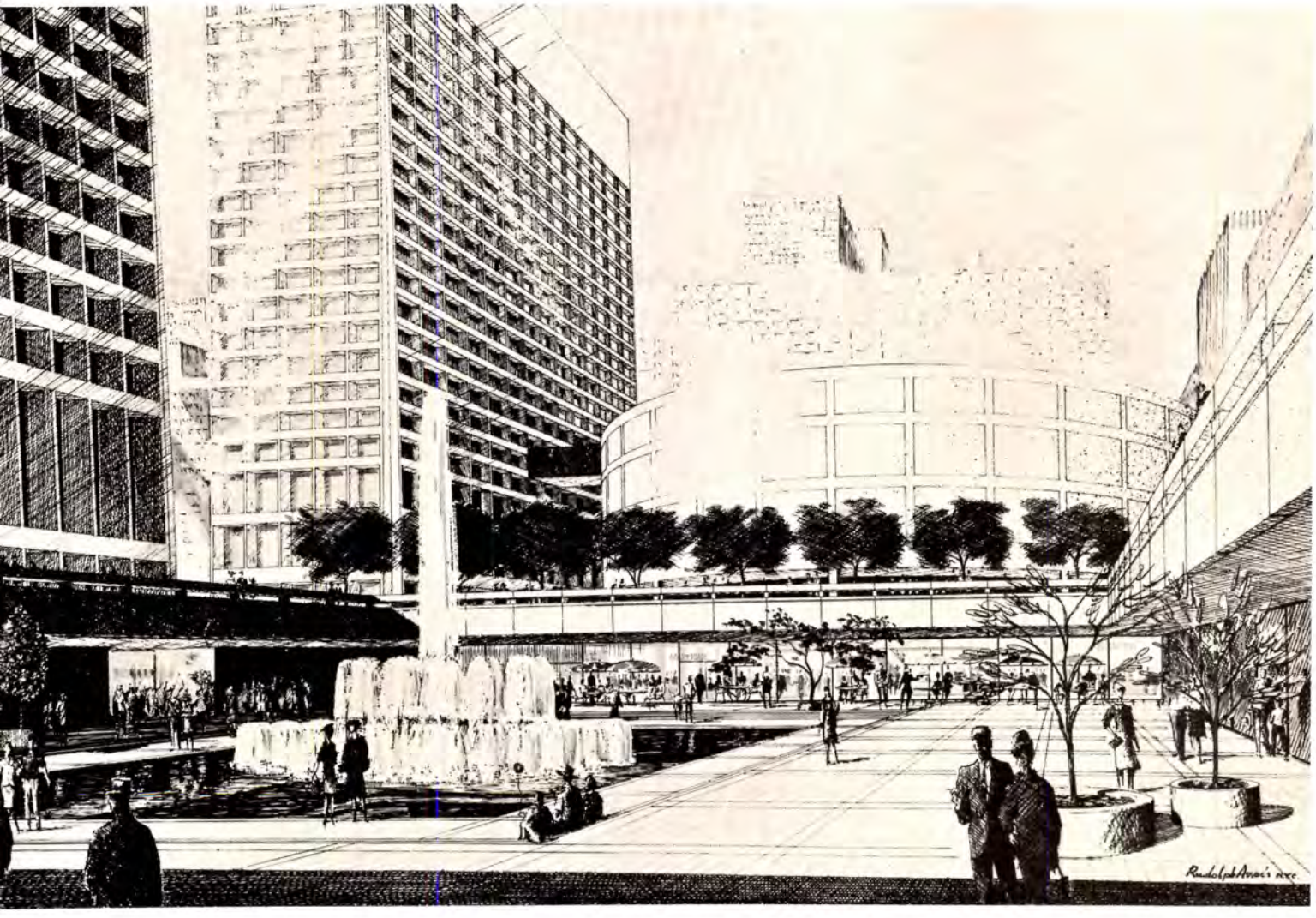


The design of the other elements in the complex is still at a very preliminary stage. The department store, which has a rectangular framing system in the plans illustrated, appears as a round building in the renderings and model photographs, and neither the hotel nor the double office building has yet been studied in detail. It is assumed that there will be some overhead bridges connecting the department store and the hotel, with the roof of the store perhaps developed as the hotel's pool and terrace area. It seems to be a condition of the large multi-use complex that its design must take place sequentially after the concept has been established, which is always a difficult problem.

The complexities involved also require that the developer bring together architects, engineers, and the contractor at an early stage, both so that there could be immediate consultation over the feasibility of design concepts, and also so that the design could evolve along with studies of the real estate market.

It is the developers' hope that Main Place can help bring about a "two-shift" downtown, which will continue to be active until the late evening hours. They also hope that adjacent buildings can be joined to Main Place via the underground concourse system, ultimately creating an extensive pedestrian network, making the whole area a multi-level complex.

MAIN PLACE, Dallas, Texas. Architects: *Skidmore, Owings and Merrill, in association with Harwood K. Smith & Partners;* structural engineers: *Paul Weidlinger, in association with Mullen & Powell;* mechanical and electrical engineer: *Herman Blum;* general contractor: *Henry C. Beck & Company.*

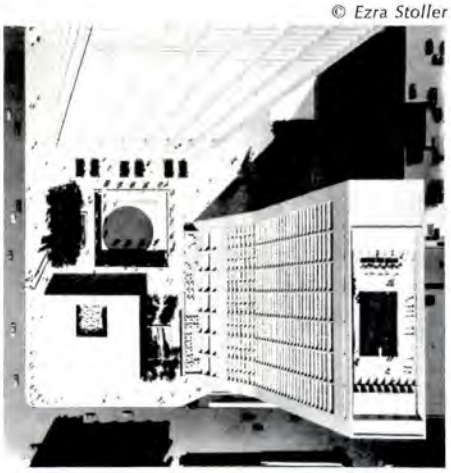


The open courtyard above is really a key element in the Main Place project because it enables the large areas of open space to be more intensely utilized. Street-level plazas are frequently wind-swept and barren; raised platforms have a tendency to exclude passers-by. A sunken courtyard, however, seems to remain more a part of the city fabric, and provides a display that can act as a lure to passing pedestrians while a whole series of shop frontages are opened up that would never have been possible at street level. Naturally, lower-level shops require special provision for servicing, which is achieved by means of a tunnel under Main Street. The section, at left, shows the relationship between the various levels and the placement of the sunken courtyards so that they complement the two major office buildings.

OFFICE COMPLEX GIVES A NEW SCALE

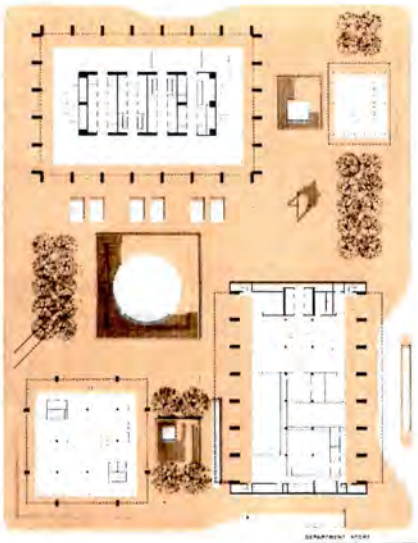
The Carlton Centre complex will represent a tremendous jump in scale for the city of Johannesburg. The central business district grew up around a street plan left over from the days when the city was a temporary mining camp, and is characterized by small blocks, narrow streets and very little open space.

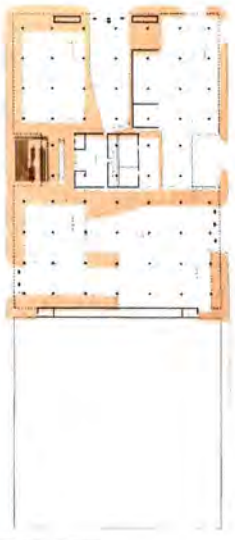
Carlton Centre, which will occupy a superblock comprising four ordinary city blocks plus a fifth located across a street, will be the first complex of this kind in Johannesburg and the largest commercial development in Africa. The basic prin-

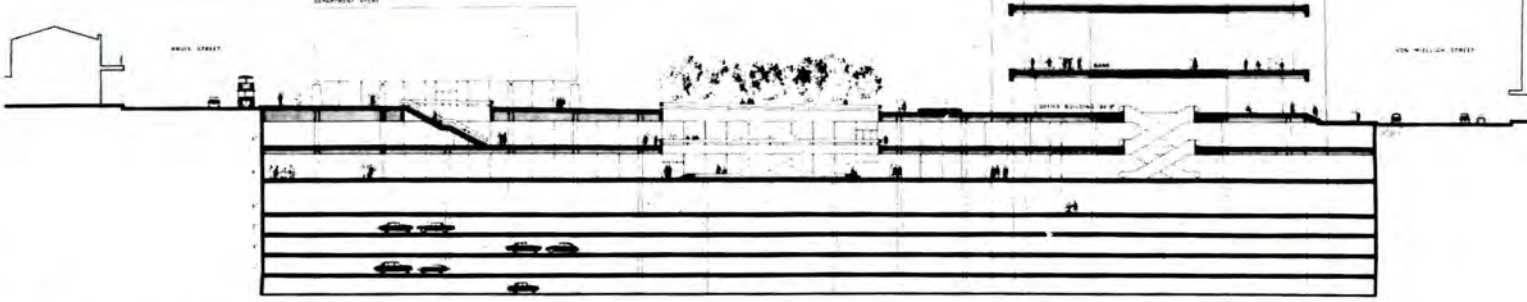


© Ezra Stoller

The section at right shows the relationship of the office structure to the plaza and to the two-story underground concourse of retail space that surrounds an open courtyard. Service and automobile access appear in the section at far right, which also indicates how the stepped profile of the hotel accommodates large banquet rooms and apartment suites below the typical bedroom floors. The plan shows the whole complex at the plaza level, while the model photos give an aerial view and an impression of the Centre as it will look at night.







ciples of its design are quite similar to Skidmore, Owings and Merrill's earlier design for Main Place in Dallas. There is a large office tower, in this case 51 stories high, which offers substantially bigger floor areas than are generally available in the city's existing buildings. There is also a large underground concourse of retail shops, which at Carlton Centre occupy several different levels because of changes in grade across the site. It is interesting to note that the dimensions of the open courtyards are smaller at Carlton Centre than at Main Place, partly because there is less land available, but also because the smaller size was deemed more efficient.

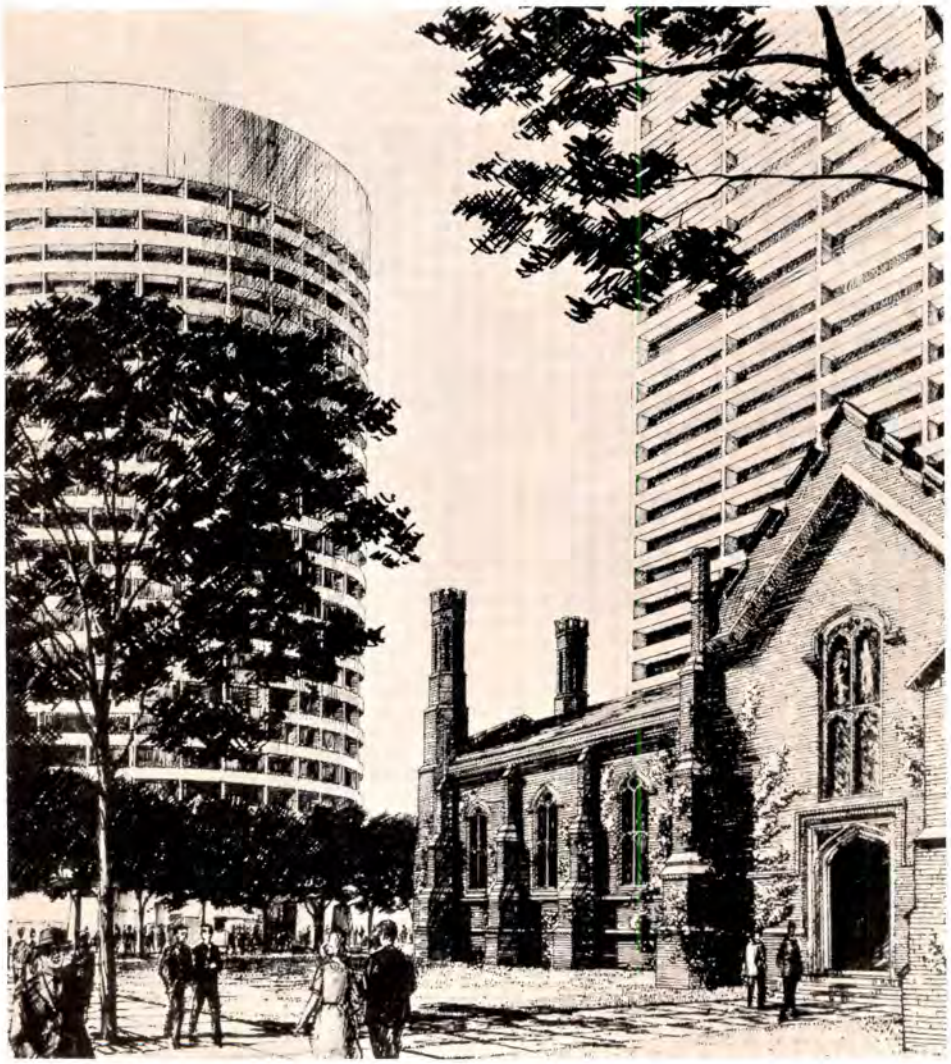
Other aspects of the project include a 400-bedroom hotel with 90 additional apartment suites on the lower floors, two department stores, and parking for 3,000 cars—partly below grade, and partly in the "parkade" that occupies the fifth block.

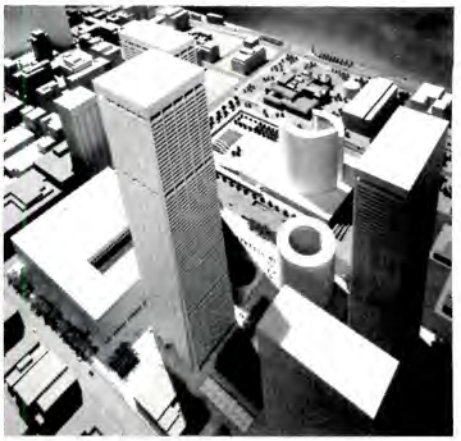
The developers claim that the open space made available to the city at the plaza level represents a 50 per cent increase in the amount of public open space downtown, and it will be landscaped with gardens and fountains, sidewalk cafes, and a skating rink. The whole complex is slated for completion in 1971.

CARLTON CENTRE, Johannesburg, South Africa. Architects, *Skidmore, Owings and Merrill, and W. Rhodes-Harrison, Hoffe and Partners;* structural engineers, *Paul Weidlinger in association with Ove Arup and Partners;* mechanical engineers, *Syska and Hennessy Inc. in association with Watson, Edwards and Van de Spuy;* quantity surveyor, *Farrow, Laing and McKechnie, Roos and Roos, Venn and Milford;* economic consultant, *Larry Smith and Company;* traffic consultant, *Lloyd B. Reid.*

OFFICE BUILDINGS AT THE 100% CORNER

Eaton Centre in Toronto has attracted a certain measure of public controversy because its site adjoins that of Viljo Revell's City Hall, and the construction of the Centre means the destruction of the earlier, Victorian City Hall building. The problem is a complicated one, as one of the purposes of the new City Hall was to stimulate private renewal downtown, and its site adjoins the traditional "100 per cent corner," whose centrality has been emphasized by the new subway system, and its projected extensions, as well as by links to the highway system serving downtown.

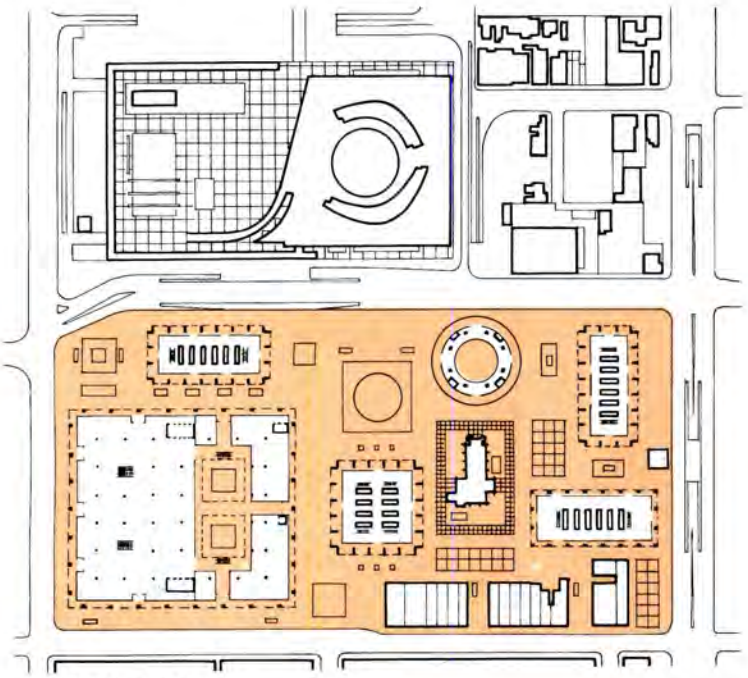




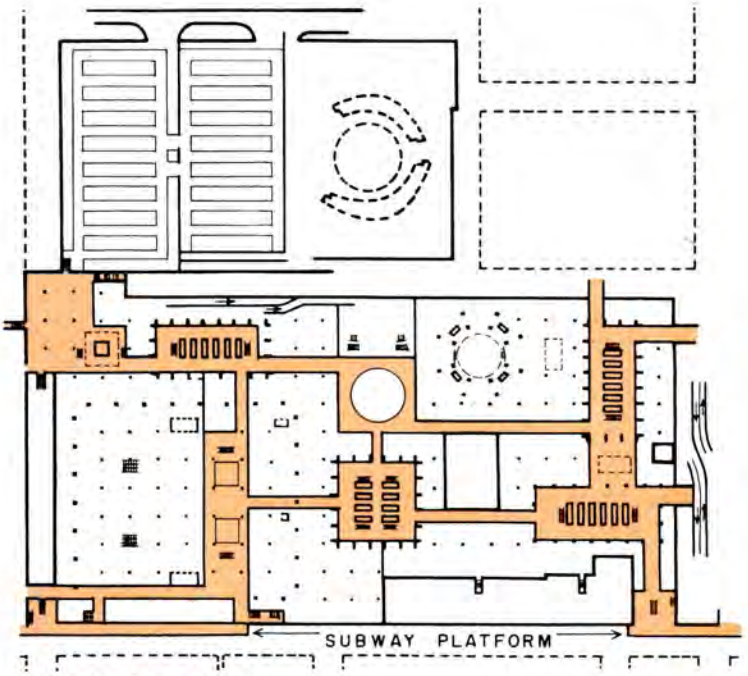
The 120-year-old Church of the Holy Trinity will be preserved as part of the plaza development at Eaton Centre in Toronto. In the background of the rendering, above, is a circular 500-bedroom hotel and part of a gigantic office and apartment tower. The entire complex, which includes three other office towers and a very large department store, will occupy some 22 acres adjoining Viljo Revell's new City Hall, creating a considerable problem for the designers, who must try to avoid dwarfing the civic structure. The location of the complex is at the traditional 100 per cent corner, soon to be accessible from two subway lines. Parking levels for 2,700 cars are connected to an existing City Hall garage, and an underground concourse joins all elements of the site, so that it is not necessary to cross any streets.

Eaton's Department Store, which is located next to the old City Hall building, wished to expand, and it also wished to take advantage of its central location to add office space, which in turn would create more potential customers for the store. The idea of selling the old City Hall to a private developer naturally became quite a political issue, but Eaton's proposal turned out to be an attractive one to the city, and the Council agreed to lease the old building subject to further negotiation of terms, despite its character as a landmark.

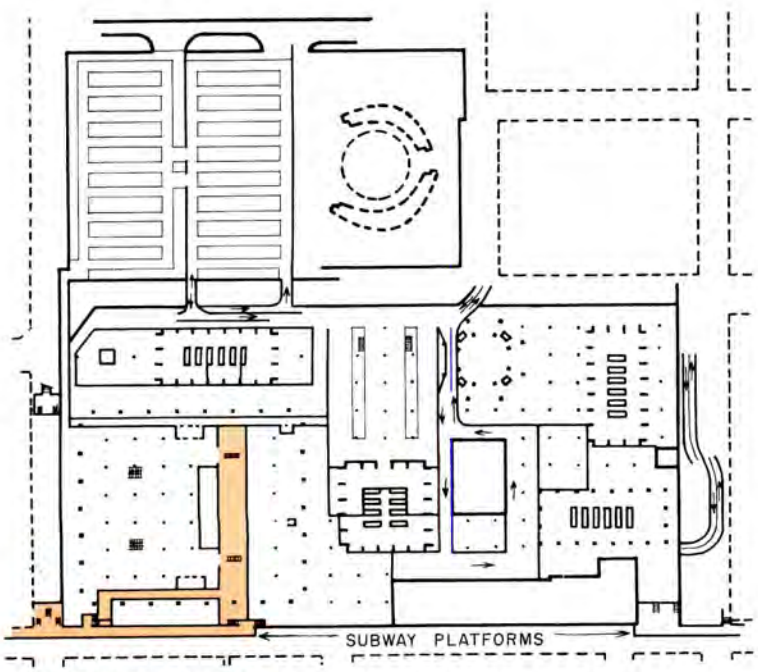
From the point of view of location, the proposal makes every kind of sense, permitting a direct connection from the parking levels at Eaton Centre to the garage under the new City Hall, and to another near-by renewal project. Architecturally, however, the juxtaposition of the new City Hall and a series of much larger office towers is not particularly fortunate, and puts a considerable burden on Skidmore, Owings and Merrill, the architects for Eaton Centre. The design shown on these pages is not a final solution, and will be subject to much further refinement and change, and it is difficult to imagine how the problems involved in the juxtaposition can be fully resolved. The problem is certainly not of the architects' own making: the plan for Eaton Centre represents development at a scale which makes the greatest economic sense in an increasing number of situations, a point that was clearly not appreciated by the competition jury when they chose a tower scheme as the winning design for the City Hall. The whole history of the office building, at least in North America, is for one tall building to



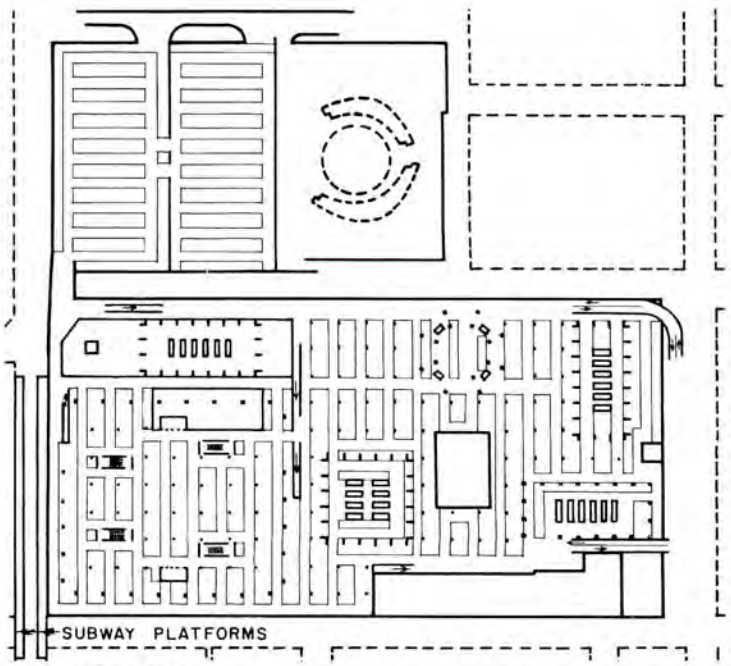
PLAZA LEVEL



PROMENADE LEVEL



CONCOURSE LEVEL



PARKING LEVEL

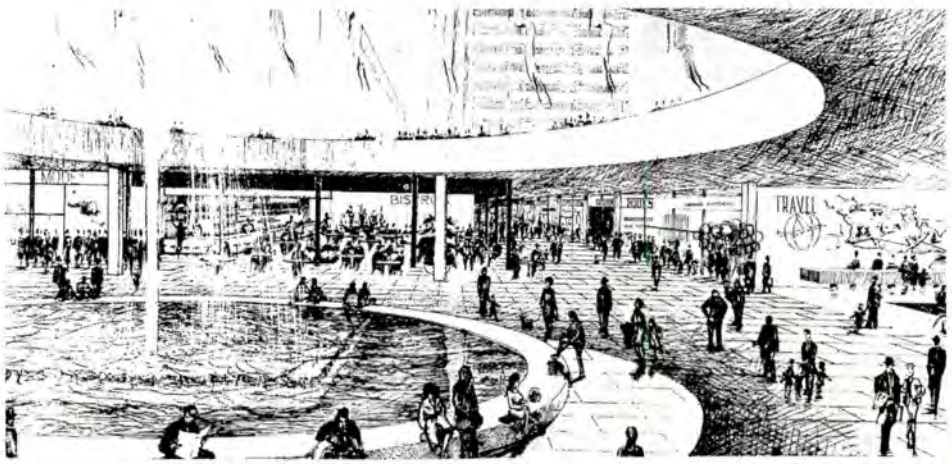
be overshadowed by another, taller building; and, in the absence of a design plan for the whole downtown area of Toronto, such a result was practically inevitable, and was in fact anticipated in the minority report of the competition jury.

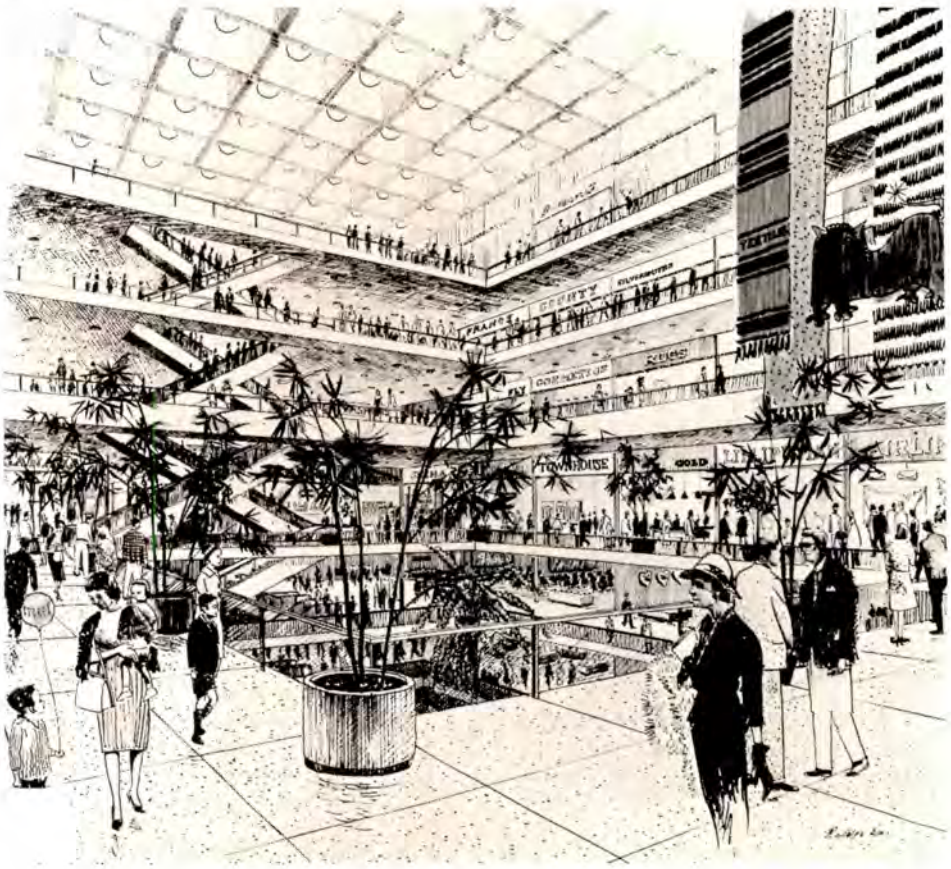
Eaton Centre is a very large multi-use development that will eventually cover some 22 acres. While the final program is yet to be determined, the initial announcement states that there will be two 57-story office towers, a somewhat smaller 32-story office building, a 500-room convention hotel, and, to top it off, a 69-story combination office building and apartment tower.

The new Eaton's Department Store will contain a multi-level shopping arcade for specialty stores, in addition to retail space in the concourse level below grade, which will be lit by courtyards open to the plaza above. The complex also includes extensive parking facilities and access to the city's subway system from the pedestrian concourse.

The Church of the Holy Trinity, an 120-year-old structure of some historical significance, will be left on the site, a once prominent structure which now becomes a form of garden sculpture for its gargantuan neighbors.

EATON CENTRE, Toronto, Ontario. Architects: *Mathers & Haldenby with Skidmore, Owings and Merrill consultants;* structural engineers: *Paul Weidlinger and M. S. Yolles Associates Ltd.;* mechanical and electrical engineers: *H. H. Angus & Associates Limited, Ellard-Wilson, and Jaros, Baum & Bolles;* town planners: *Professor James A. Murray and Vincent Ponte;* traffic engineers: *Barton-Aschman Associates Inc.;* market research consultants: *Larry Smith and Company;* Eaton's interiors: *J. W. Whytock and E. L. Hankinson with Daniel Schwartzman, consultant.*





A pedestrian shopping concourse a story below grade is lit by a court open to the plaza above. Eaton's Department Store will have a glassed-roof gallery, 100 feet high, housing an arcade for specialty stores.

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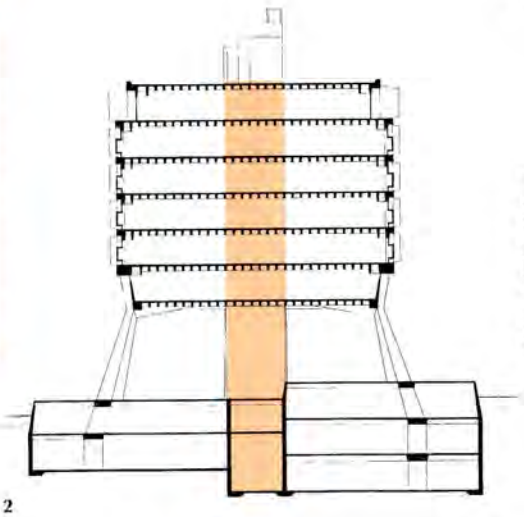
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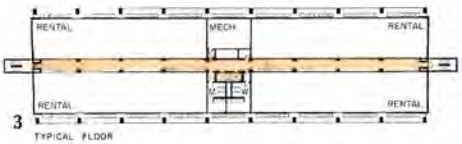


3

1. The American Association of Textile Chemists and Colorists headquarters building by G. Milton Small, which is shown in detail on pages 172-173. 2. The American Institutes for Research building by Tasso Katselas which is shown on pages 174-175. 3. The Poplar-Perkins Building by Walk Jones/Mah and Jones/, which is shown on page 176.

OFFICE DESIGNS THAT BREAK THE PATTERN

The standard office building of today, with its smooth external envelope, regular bay system, and internal elevator, stair and service core, has indeed evolved toward perfection of a certain kind. Most variations take place in such characteristics as the proportions of a bay, the integration of the external wall into the structure, or the method of sunshading, rather than in the basic configuration of the spaces. As the office building becomes more closely associated with other types of land use, the form that has been derived for a segregated, specialized use may have to change. It may well be that the true form of an office complex is not a series of towers related to a multi-level base, but an arrangement more like that of Romaldo Giurgola's Market Street studies for Philadelphia or the building by Moore and Turnbull which is shown on pages 180-182.

In any event, the three buildings that appear on the following pages have been selected because they suggest breaks in the pattern, either of circulation or of structure, and can provide a practical demonstration of a more unconventional approach. The headquarters building for the American Association of Textile Chemists and Colorists has a peripheral corridor for its main circulation system. The American Institutes for Research building has a structure that adapts itself to the different requirements of offices and parking, and raises the offices clear of surrounding buildings. The Poplar-Perkins Building provides a simple, direct solution to the problem of the small speculative building, rather than offering the conventional large-building solution on a reduced scale.

There are other important questions, for surely these three buildings are unconventional in a relatively modest way. What is the nature of an optimum working environment? Is it really an evenly lighted, low rectangular space, as free from columns as possible? Wright's Larkin building proposed a different solution more than 50 years ago. With all the technological possibilities open to us today, are we really sure that only the conventional answer is economically feasible?

PERIPHERAL CORRIDOR PROVIDES SUN CONTROL

This office building has taken the opposite course from the one conventional wisdom dictates; instead of placing all circulation around an interior core, the corridor follows the periphery, where the prime office space is usually located. The corridor thus fills the role of the exterior access galleries which are traditional in warm climates, and protects the offices themselves, which all have their own windows and enjoy the usual advantages of peripheral space. The cantilevered structure expresses the gallery-like nature of the corridor.

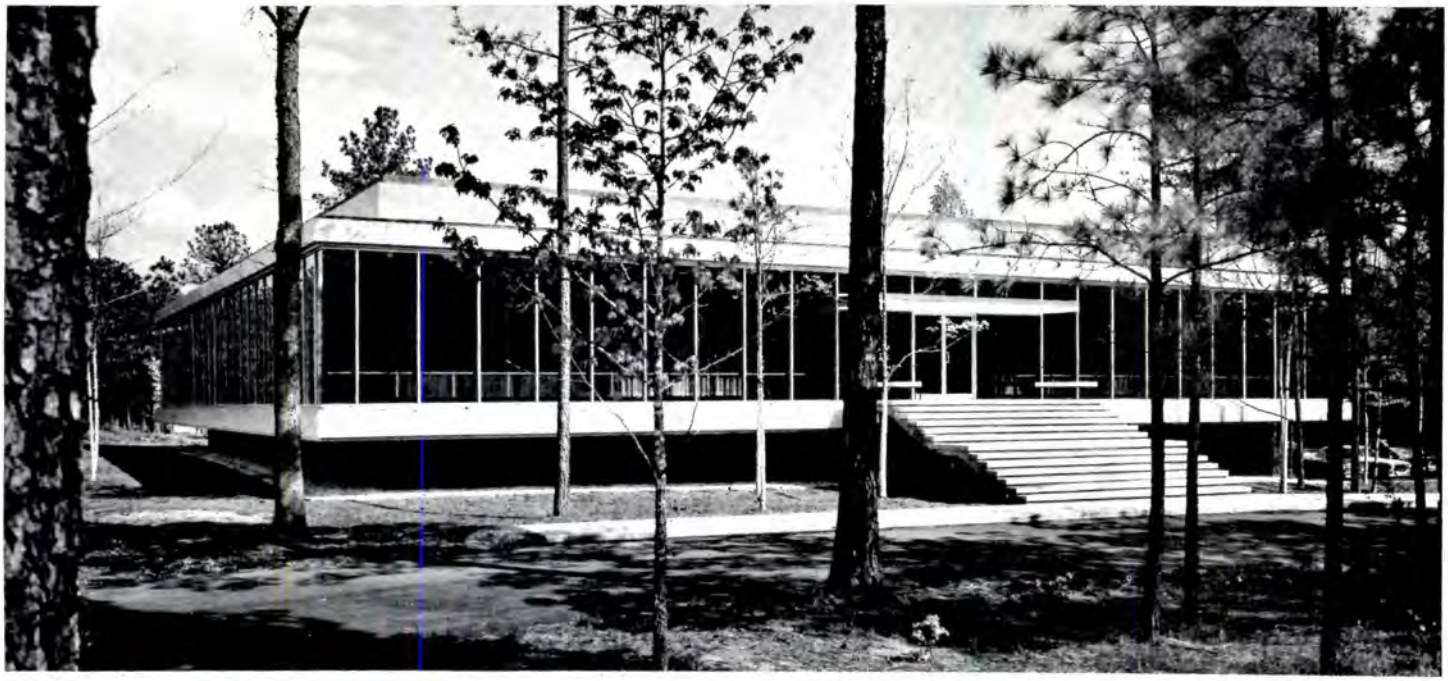
Joseph W. Molitor photos

The peripheral corridor provides a climate control zone that protects the windows of the offices themselves from direct sunlight, and also from the heat transmitted by the exterior glass. The steel structure expresses the gallery-like nature of the corridor by cantilevering it out beyond the foundation of the building.

As the headquarters for the American Association of Textile Chemists and Colorists, the building serves a fluctuating number of users. The relatively small permanent staff is augmented from time to time by large groups that come for meetings or demonstrations. The plan takes note of this situation by making the meeting room a short cut that can be used at all times except when a meeting is actually in progress. There is always an alternate route via the corridor. A small but well equipped laboratory occupies about a quarter of the space and is used for developing test methods and uniform standards.

Although this building is located in a wooded site in the Research Triangle Park, its design solution would seem to have applications in a number of other situations. It is always an alternate possibility for a single-story building of large floor area, and could be worth considering in any case where access to a central core is difficult—for example, when offices are to be placed above groups of shops. The exterior gallery could also provide a logical means of connecting blocks of office space in large building complexes. Although such a discussion is necessarily speculative, this small building can be considered a practical demonstration of a much larger design principle.

NATIONAL HEADQUARTERS OF THE AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS, Research Triangle Park, Durham, North Carolina. Architects: *G. Milton Small and Associates;* structural engineer, *Ezra Meir and Associates;* landscape architect, *Lewis Clarke;* general contractor, *Target Construction Corporation.*



A STRUCTURE THAT MEETS TWO DIFFERENT NEEDS

The long, bent, almost insect-like piers that support this building came into being as the direct result of the conflict between parking needs and zoning requirements. The lower levels of the site could be fully utilized for parking only if the columns were placed within 15 feet of the property line. Zoning regulations, however, restricted the periphery of the building itself to a line considerably farther within the site. The logical answer was to bend the piers so that they met both criteria. The piers support a main perimeter beam which occurs just

Jay Bee Studios

Jay Bee Studios

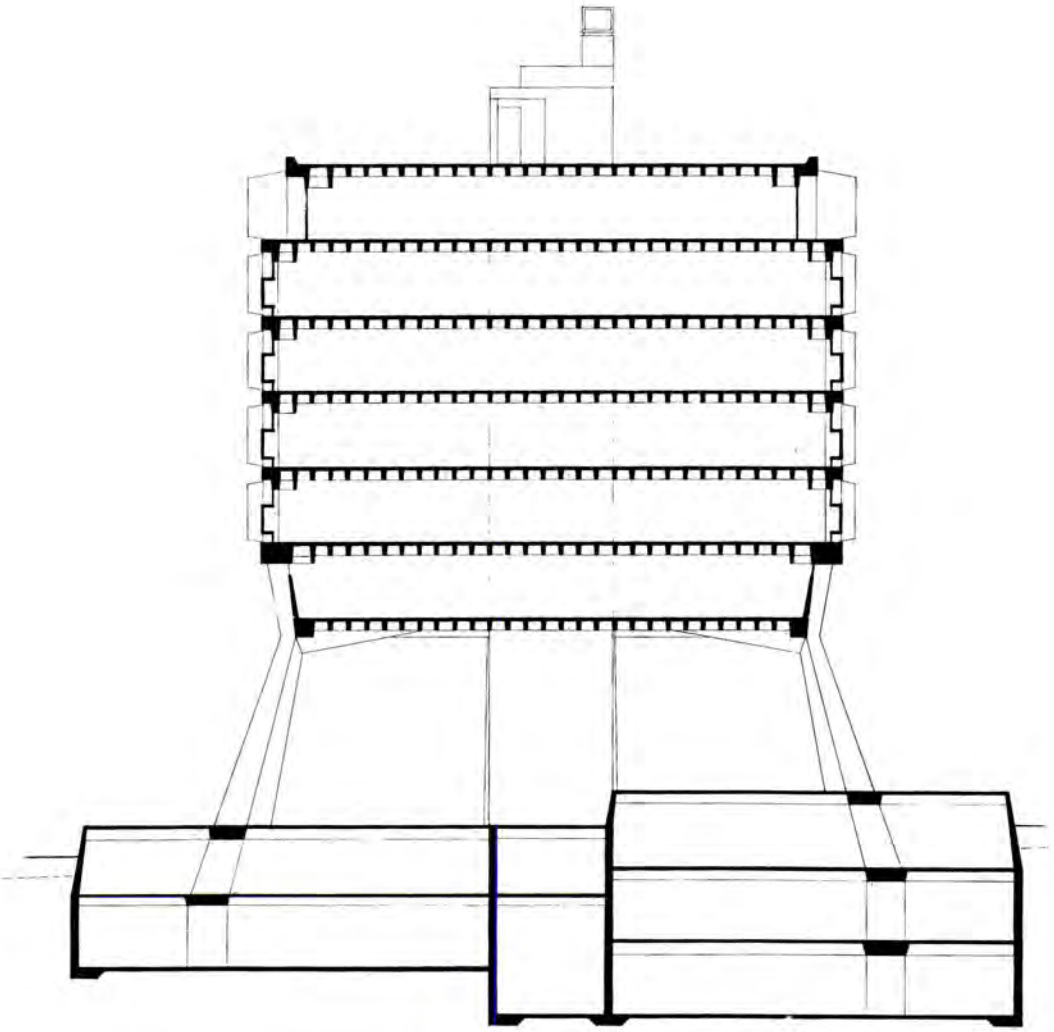
The supporting piers are bent so that they can be placed where they will not obstruct parking at the lower levels and will still accommodate the upper floors, which, because of zoning restrictions, must be set back within the site boundaries. Interior spaces had to be free of columns in order to permit variations in the circulation pattern. The present building has 60,000 square feet of office space, with provision for the future addition of two more floors, each with an area of about 10,000 square feet. The garage provides parking for 100 cars. The site is in the center of the Oakland area of Pittsburgh, near the universities, and adjacent to an old church, which is oriented to the street on the higher side of the site. The main portion of the building is raised to a level above grade which the architect feels minimizes the visual conflict with surrounding structures, and permits an independent character for the design.

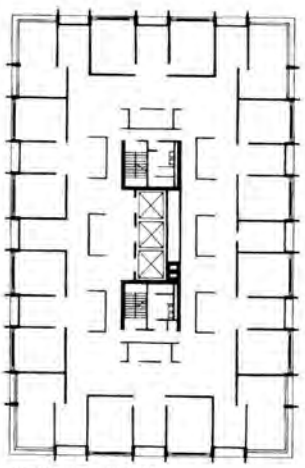
above the first story of the upper structure (see section). The entrance lobby is deeply recessed as a consequence of the split in levels of the parking below, which takes maximum advantage of the drop in grade across the site. The lobby can be small because access to the building, which is a research facility involved with many government contracts, is restricted to the occupants and authorized visitors. The unusual distance between the ground and the first occupied floor is designed to free the space at the lower levels from conflict with its surroundings.

American Institutes for Research, the client for this building, is an organization that incorporates many research programs in the social sciences. It needed column-free spaces to accommodate a circulation pattern that varied from floor to floor, depending on whether the areas were for staff use or open to visitors. The plan, below right, shows the laboratory floor, which requires only access to suites of rooms used by the staff. This laboratory floor occupies the recessed level below the main perimeter beam. The other plan shows a typical program floor, where visitors and staff circulation are separated by movable glass cubicles for the secretaries.

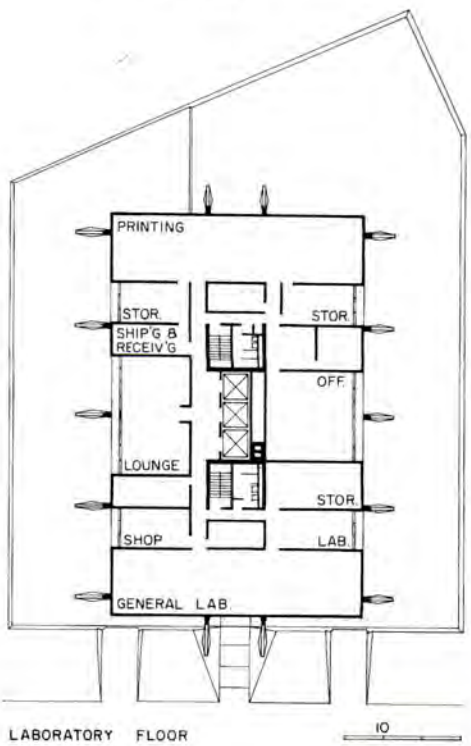
Although the concept of this building evolved in answer to a particular set of circumstances it might well point to other applications relating diverse elements of multi-use developments.

AMERICAN INSTITUTES FOR RESEARCH, Pittsburgh, Pennsylvania. Architect: *Tasso Katselas*, structural engineer: *R. H. Gensert;* mechanical engineer: *George Evans;* electrical engineer: *Anthony Eichmueller;* general contractor, *Navarro Corporation.*





PROGRAM FLOOR



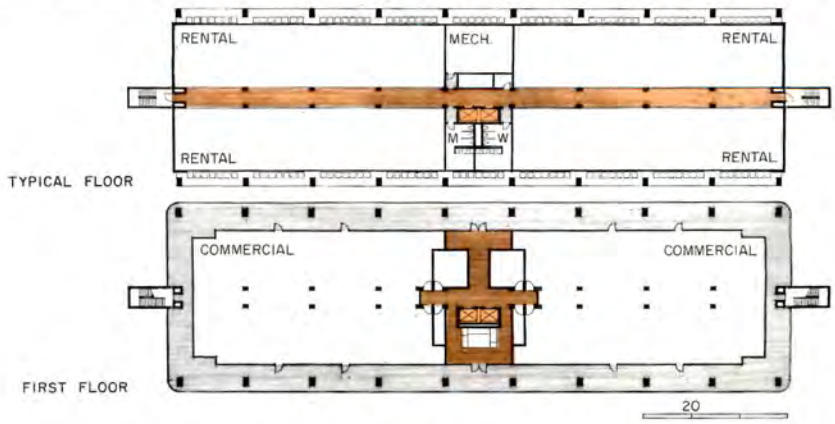
LABORATORY FLOOR

APPROPRIATE FOR SMALLER OFFICES

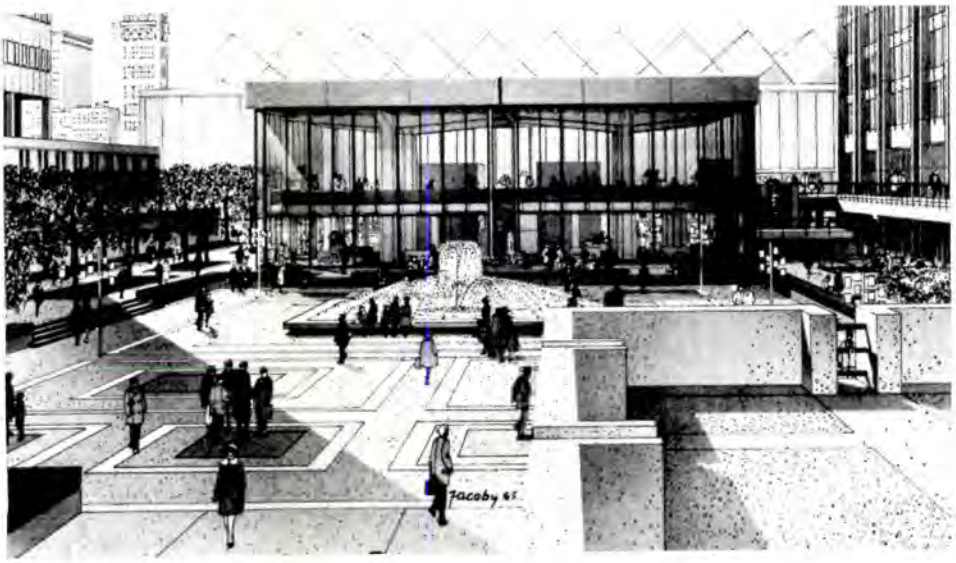
A clear and direct solution to a very typical problem is provided by this speculative office building in Memphis. Space devoted to circulation is held to a minimum by pulling the stair towers outside the building envelope. The 27-foot bay and the 31-foot depth from corridor wall to perimeter window provide spaces that are adaptable to a number of different types of small- and medium-sized tenants. For example, there is room for an internal double-loaded corridor in a suite of doctors' offices, as well as a more conventional arrangement of clerical space and peripheral offices. A large tenant could take half a floor or more; a small tenant need not even take a whole 27-foot bay.

The double-loaded corridor form seems far better adapted to a building of this size than a junior edition of the standard office circulation pattern.

POPLAR-PERKINS BUILDING, Memphis, Tennessee. Architects: *Walk Jones/Mah and Jones/Architects/Inc.;* structural engineers: *Gardner and Howe;* mechanical and electrical engineers: *Allen and Hoshall;* general contractor: *F. T. Thayer, Jr.*



This speculative office building, located in a landscape that consists mostly of parking lots, has a strong simple form that is well adapted to its size and the needs of its tenants. The bays are on 27-foot centers; the over-all length from end of stair towers is 284 feet; the width is 72 feet over-all.



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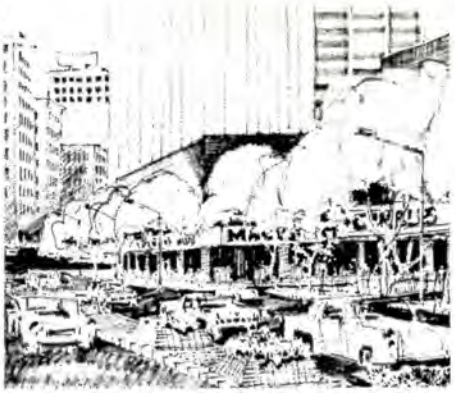


1. Detail of the Area 12 development of the Charles Center in Baltimore by Peterson and Brickbauer and Emery Roth & Sons, which is shown on pages 178 and 179; and, 2., the Akron Cascade Superblock, in Akron, Ohio, shown on pages 180-182 for which Lawrence Halprin and Associates were the urban designers and Moore-Turnbull the architects.

OFFICE BUILDINGS AND URBAN RENEWAL

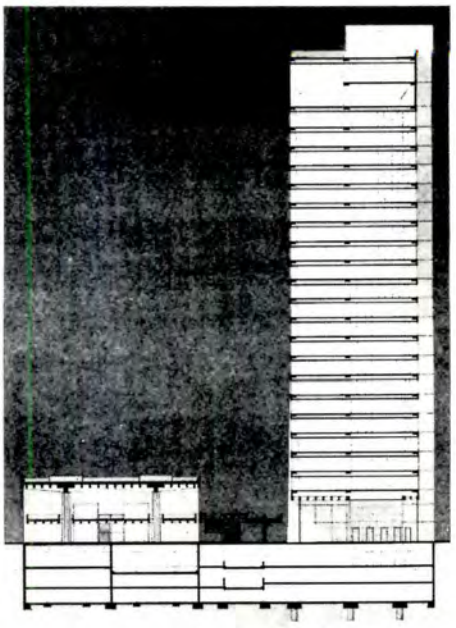
The architect's role in designing an office building for an urban renewal project is much more complicated than in an individual structure or even a privately-developed multiple-use complex in a downtown location. The nature of Federal renewal legislation as it presently stands makes it necessary to establish a conceptual framework at a very early stage, and this concept is usually separated from the design of actual buildings by several years of highly involved bureaucratic procedure. For example, when Peterson and Brickbauer came to design the office building at the Charles Center in Baltimore shown on pages 178 and 179, they had to work with a whole series of fixed conditions which had been established by a preliminary massing model many years before. While it is possible to "feed back" modifications into such early master plans, the process is inevitably much clumsier than the way in which such a plan could be designed if all the conditions had been part of the program from the beginning.

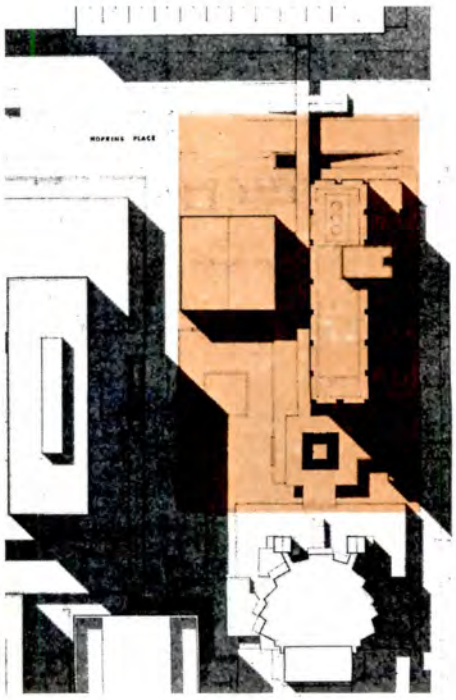
It is possible, of course, that whole districts of cities should not, or can not, be designed through the conceptual processes that work for individual buildings, but many architects are now attacking the problem of creating conceptual designs, at a scale larger than an individual building, which provide for a number of different kinds of land use. The Superblock in Akron, which is shown on pages 180-182, is an example of such a design concept being fed into the renewal process. The stepped back form that appears in Skidmore, Owings and Merrill's Carlton Hotel in Johannesburg (page 167), or in Professor Sir Leslie Martin's studies for the redevelopment of the government office complex in the Whitehall district of London, shows one way in which multiple land use can be assimilated into a single building. Perhaps such studies will lead, after a period of further research and development in many different situations, to the establishment of a new building type, where the office building is not simply modified by a new context, but incorporates it as well.

MEETING FIXED DESIGN CONDITIONS

The Charles Center in Baltimore is one of the earliest, and also one of the most successful, downtown multiple-use developments. It is a large complex of buildings connected by a matrix of underground garages, walkways, plazas, and retail shops, which contain the office buildings (one of which was existing), two hotels (of which one was already on the site), a theater, and two apartment houses.

The construction of the office buildings has proceeded sequentially, so as not to disturb the existing Baltimore rental market, or the prospects for the earlier



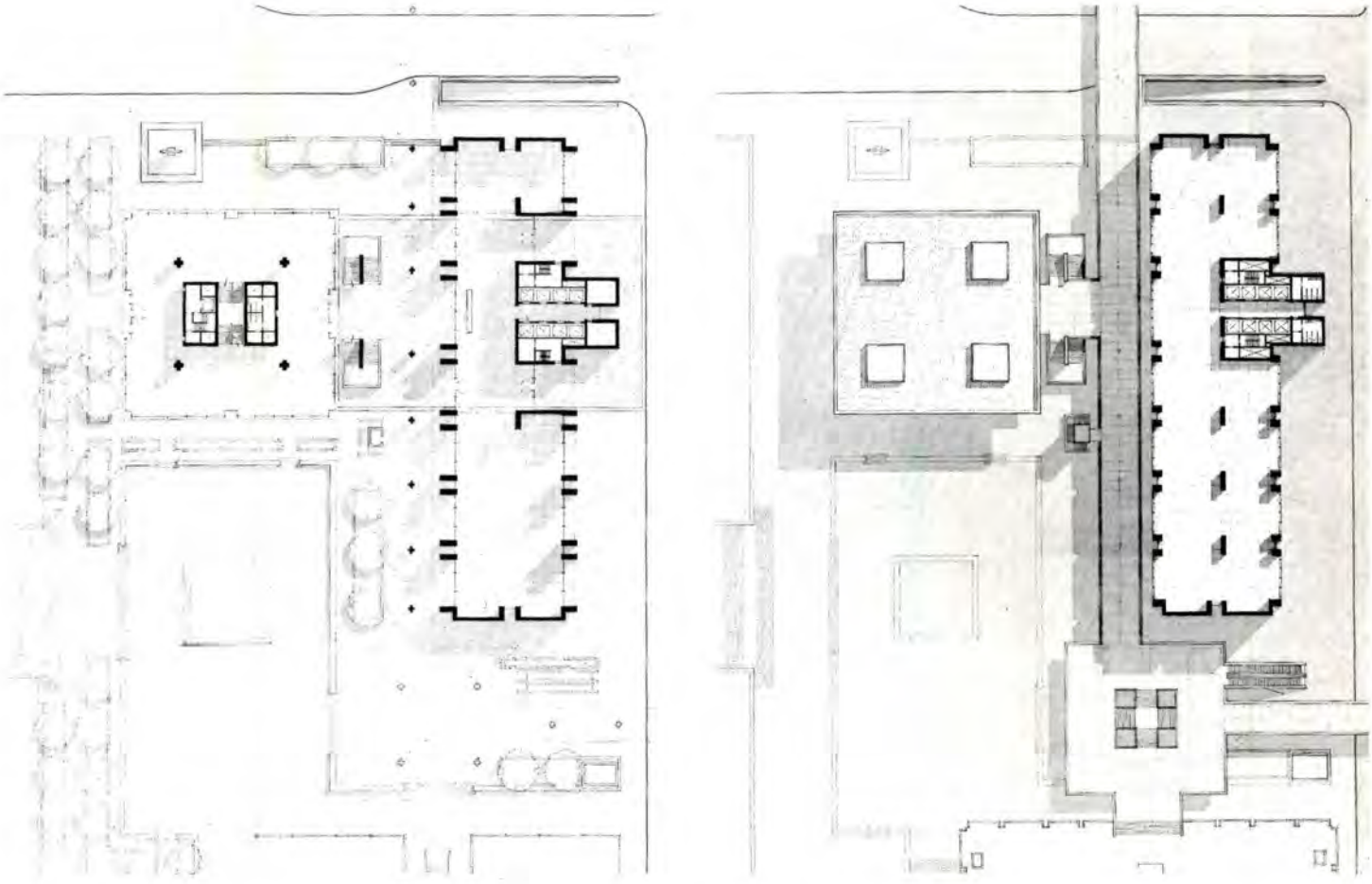


buildings in the Center. The Area 12 Building, shown here, is the latest in the series to go forward. Peterson and Brickbauer, also the designers of the Sun Life Building at Charles Center (September, pages 173-178) were selected as part of the winning architect-developer team after a limited competition. They had some fixed conditions to fulfill. The relationship between the upper and lower walkways was given, it was necessary to provide a certain amount of garage space, and the basic envelope and two-part massing had already been determined.

The solution is straightforward and economical: a reinforced concrete building in which the structure is also the architecture. The exterior will be buff colored and rough-finished, with bronze colored glass in bronze anodized aluminum frames and spandrel panels. Bright chromium tracks for the window washers' scaffold provide a contrasting effect. The adjoining pavilion for a bank is treated to make it seem as separate, and as transparent, as possible.

The design conditions at Charles Center were an economic necessity, but they tended to produce quite a disparate group of buildings although they have the advantage of the liveliness that comes from variety. This situation puts a difficult burden on the architects, who must preserve their building's identity without compromising its surroundings, conditions that this building fulfills very well.

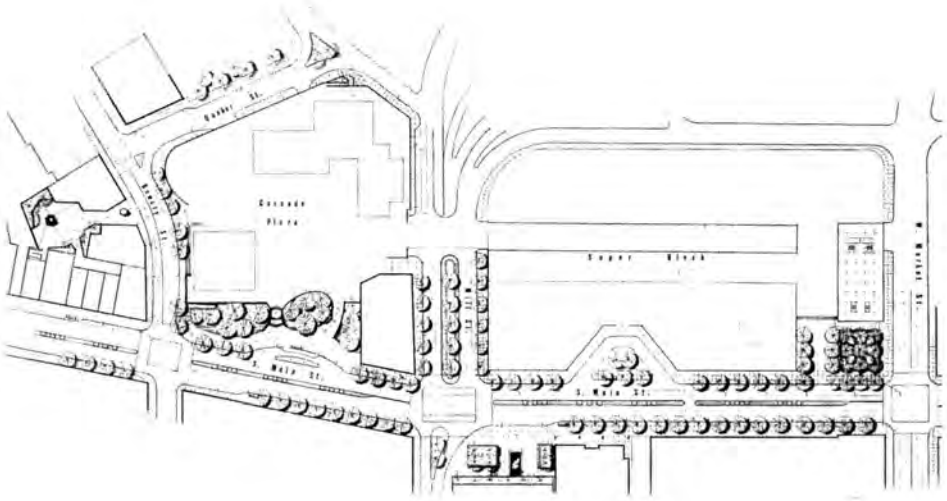
AREA 12 BUILDING, Charles Center, Baltimore, Maryland. Architects: *Peterson and Brickbauer and Emery Roth & Sons;* structural engineer: *Robert Rosenwasser;* mechanical and electrical engineers: *Cosentini Associates;* general contractor: *Gilbane Building Company.*

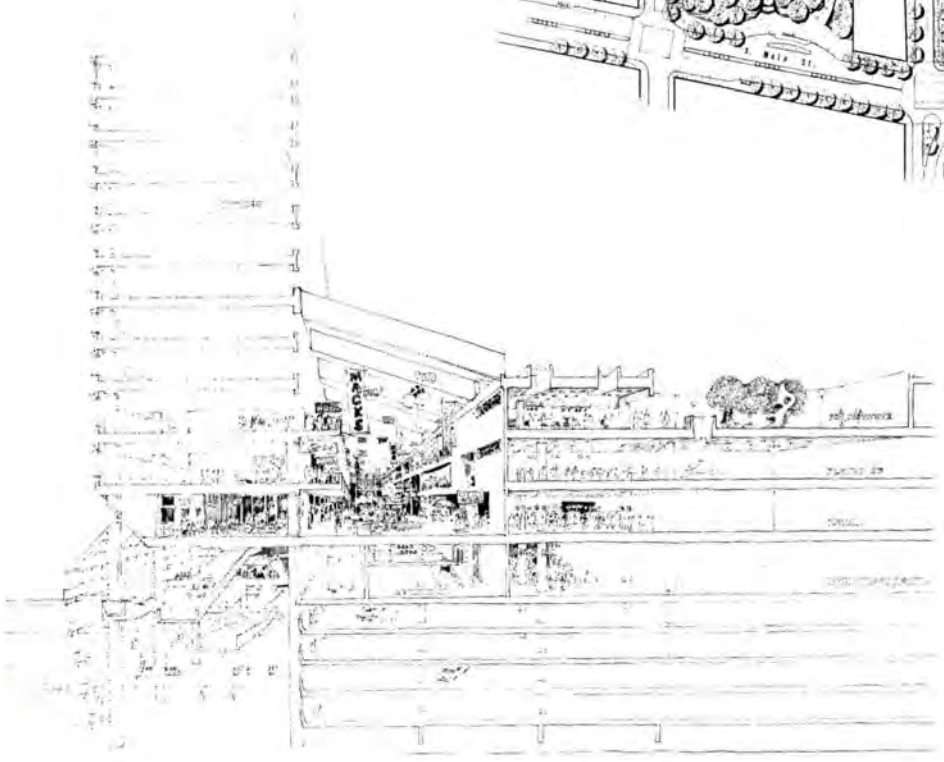


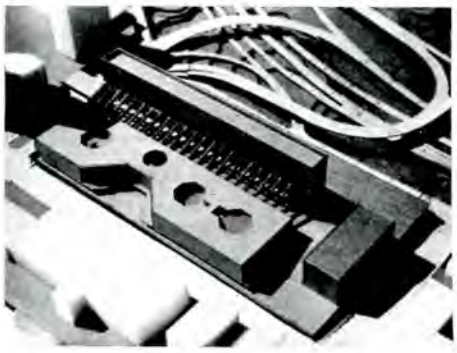
The Area 12 Building at the Charles Center in Baltimore will stand at the point of connection between the upper and lower walkway systems. The main entrance level, shown in the plan above left, if part of the lower system, with pedestrians brought down from the walkway, above right, by a double stairway. The plot plan at left shows the building's complicated relationship to other independently conceived designs, including the theater by John Johansen, the Federal Building by Fisher, Nes and Campbell, and the Sun Life Insurance Company, which is by the same architects as the Area 12 Building but was done at an earlier date. The plaza design is by Rogers, Taliaferro, Kostritsky, Lamb, who are the co-ordinating architects for the open space at Charles Center and the designers of street furniture and walkway details.

SUPERBLOCK POINTS WAY TO NEW BUILDING TYPE

The Akron Cascade Superblock in Akron, Ohio represents a step toward finding a single form for the multi-use downtown development. The office tower keeps its shape as a narrow slab, and the parking, shops, and other facilities keep their spread-out character, but the transition between the two is effected by a multi-story gallery with a slanting, glazed roof that opens up a pedestrian shopping arcade through the heart of the building. A three-sided cutout on the Main Street side provides a pick-up and drop-off point for automobile passengers.







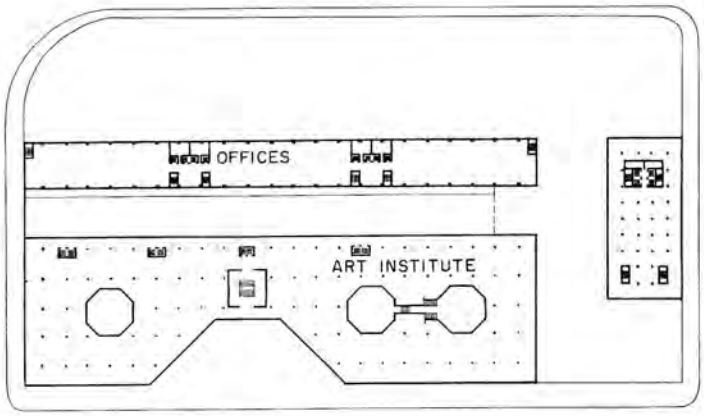
The Akron Cascade Superblock is part of an urban renewal project in downtown Akron, Ohio, that adjoins Akron's inner belt highway. Traffic from the highway can enter directly into the multi-level garage, while a three-sided entrance plaza is a major point of pedestrian access on the Main Street side. A low block containing retail shops, a department store and new quarters for the Akron Art Institute is joined to the office slab by a multi-story pedestrian arcade which has a glazed roof. The arcade in turn is connected to another part of the development, called Cascade Plaza, by a bridge that crosses over Mill Street.

A sharp drop in the grade on the side of the building facing the inner belt highway makes it easier to provide a multi-level parking garage throughout the development, as well as the necessary service tunnel. In addition to office space and shops, the superblock will include a theater, a department store and new quarters for the Akron Art Institute. Both the Institute and the department store will have octagonal courtyards open to the sky. A bridge across a major entrance to the highway connects the pedestrian arcade to another portion of the project, called Cascade Plaza, and will give the pedestrian a view of a monumental collection of highway "spaghetti" as he crosses the bridge.

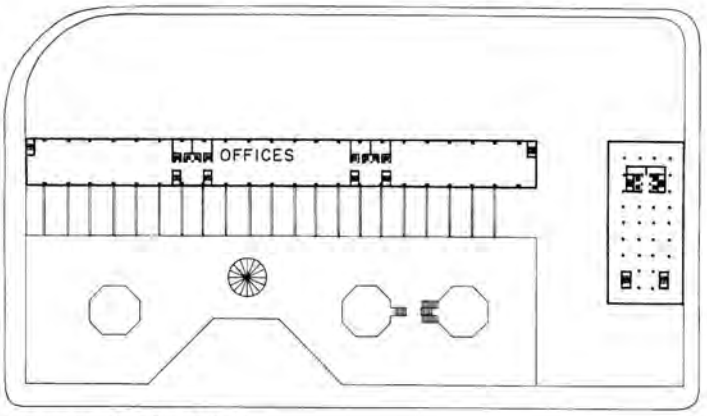
Perhaps the most important aspect of this project is that it incorporates a high level of architectural development at an early stage of the renewal process. The interesting, and significant, result is that the form of the building that emerges is an unusual one.

Creating a "conceptual design" in the survey and planning phase of urban renewal has a strong tendency to fix the level of the design at a pre-conception, rather than an architectural concept, because the planner almost inevitably accepts the office building, or the shopping mall, as an independent entity which can be designed at some later point.

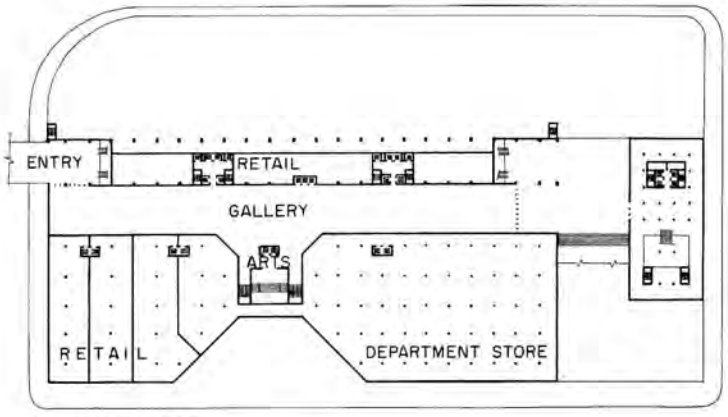
In the case of Akron, however, the work of Lawrence Halprin & Associates as landscape architects and urban designers went forward in concert with that of architects Charles Moore and William Turnbull of Moore, Lyndon, Turnbull, Whitaker. While the design is still in an early phase of development, a well-integrated



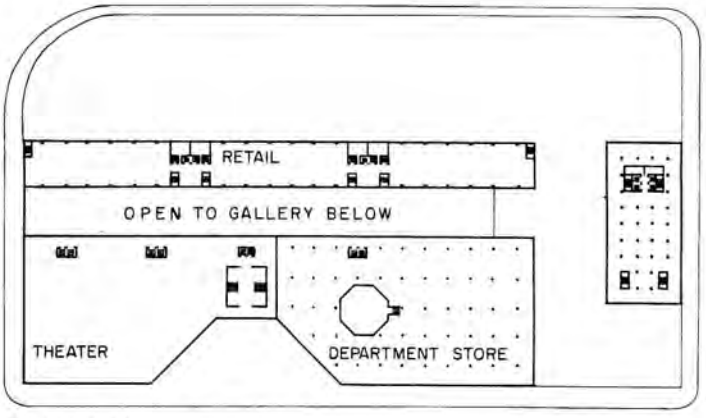
FOURTH FLOOR



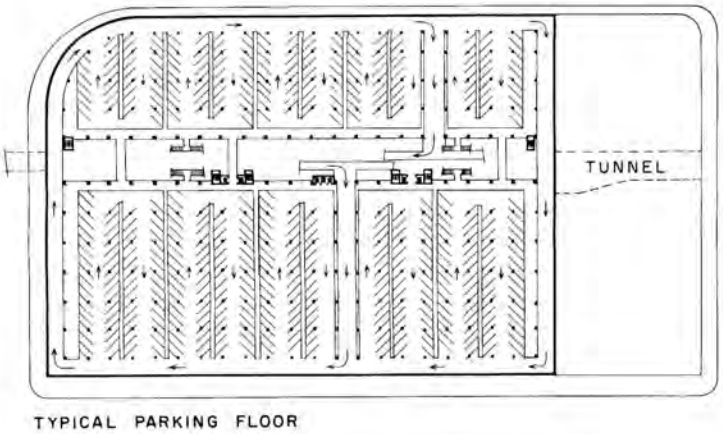
TYPICAL OFFICE FLOOR



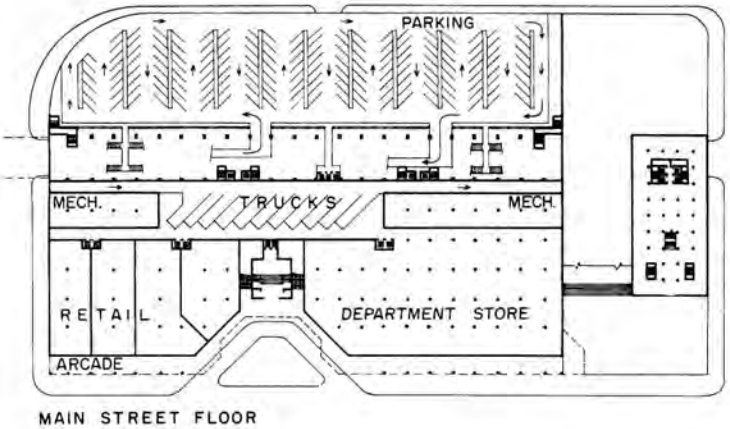
GALLERY FLOOR



THIRD FLOOR



TYPICAL PARKING FLOOR

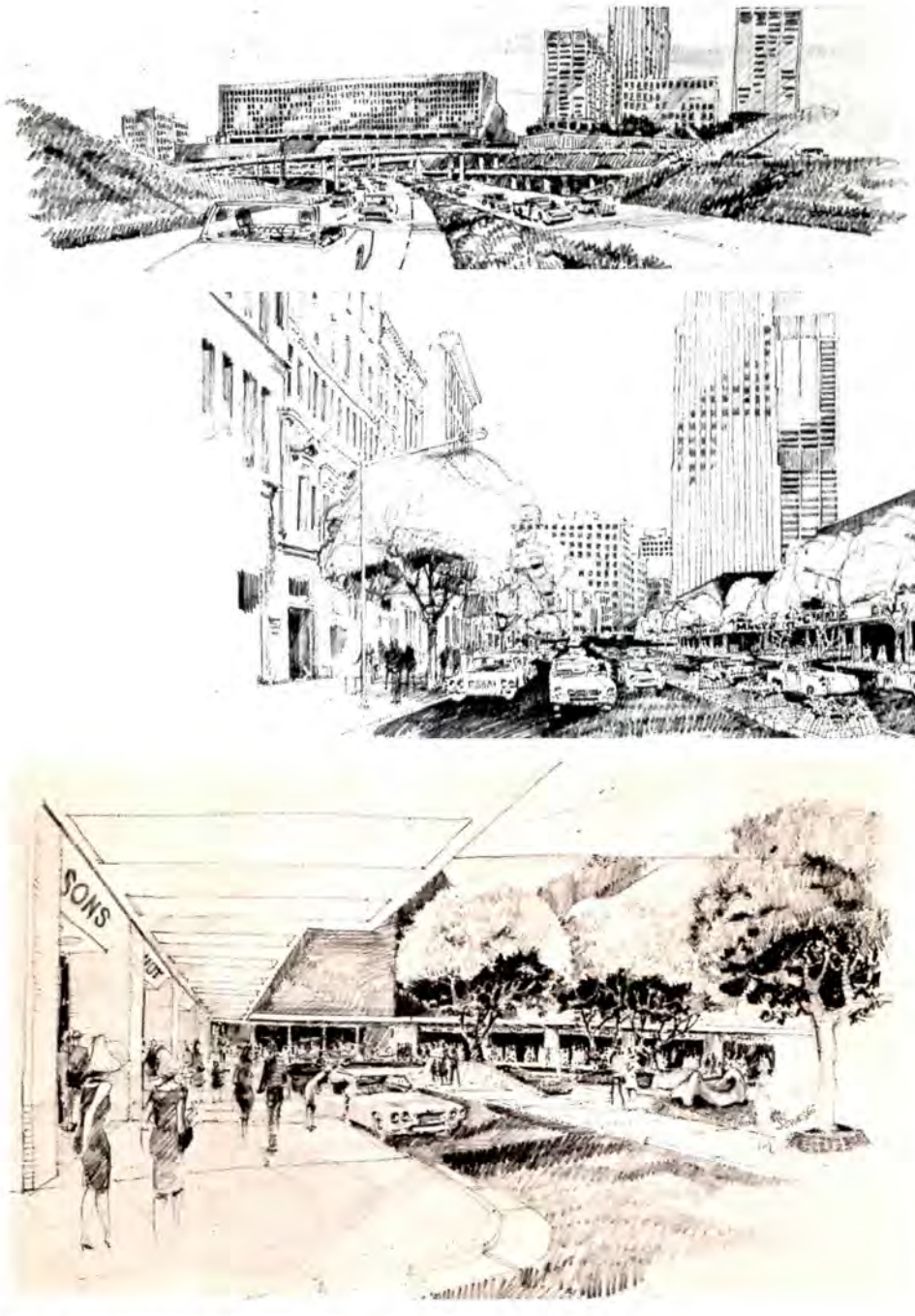


MAIN STREET FLOOR

concept has already been established. Even more integration might have been possible, including a closer relationship between the Superblock and the three buildings of Cascade Plaza, being designed by Emery Roth & Sons; but Akron is a clear example of the advantages to urban renewal of having architectural design take place in as early a stage as possible. Such early involvement of the architect in situations where innovation can take place could do much to diversitfy and enrich such a building type as the office tower, and free it of the many stereotypes and preconceptions, that have caused the apparent stagnation of its design development.

The issue, in fact, is larger than the planning of individual renewal projects, and effects concepts of what cities themselves should look like. The Akron Cascade Superblock is conceptually only a small slice of a continuous building, which, with some modifications, might be used as city center in itself.

SUPERBLOCK, AKRON CASCADE, Akron, Ohio. Urban designers and landscape architects, *Lawrence Halprin & Associates;* architectural consultants, *MLTW Moore-Turnbull.*



The three perspectives show, top, the Cascade Superblock from the Akron inner belt highway, and two views from Main Street.

Potential of foam plastics in building structures

What may be one of the most comprehensive studies of foam plastics as structural components for buildings has been published by the Architectural Research Laboratory of the University of Michigan. The study which explores the structural potential of foam plastics for housing in underdeveloped areas was sponsored by the Agency for International Development of the State Department.

The first phase of the structural investigation involved experimentation on a variety of foam plastics. The second phase involved investigation of a number of structural systems which appeared most promising. The first structure to be built was a polystyrene foam dome, 45 feet in diameter, using the "spiral generation" process. Other structures investigated included one comprising seven umbrella-shaped roof elements made of sprayed-on polyurethane foam; a two-story experimental structure made of triangulated bents of folded paper-laminated polyurethane foam board; a structure made of four, square umbrella-shaped roof elements using foam coated with reinforced polyester; and a room-size unit in which polyurethane foam board served as a mandrel for a filament-wound system.

But besides giving descriptions and analyses of these systems, the report reviews physical properties of plastics, raw materials resources, and requirements for production. In addition a review is included of marketing aspects and problems specifically related to foam plastics in technologically advanced countries which may help less developed countries.

The approach to housing in underdeveloped areas, the report suggests, is in industrialized techniques rather than in handicraft methods. For example, the authors ask, what sense does it make to use rammed earth construction in areas like Java and Ethiopia where they are ruined by rain? Emerging nations will never catch up with the more advanced countries unless they take as many shortcuts in development as possible, the report continues. "In the building field, rather than waste precious time and energy . . . it seems far wiser to take the most advanced concepts and techniques and see how they can be modified."

Concerning marketing problems of plastics in building in this country, the researchers feel that, "For some time to come . . . it will not be easy for plastics producers to make many inroads in conventional building beyond their present applications." To a certain extent codes are restrictive in the use of plastics in building, with a major stumbling block in obtaining code approval being their flammability. In this regard, the researchers feel that more study is needed of the over-all fire performance of plastic components, and that fire test data should be obtained from full-scale experimental structures. Most of the research conducted by industry, according to the report, has been with laboratory test samples, "a basis on which one can neither predict what will actually happen if a fire should start in a building, nor determine under what circumstances the various foams can be safely used."

Copies of the report, "Architectural Research on Structural Potential of Foam Plastics for Housing in Underdeveloped Areas" is available from the Architectural Research Laboratory, The University of Michigan, Ann Arbor, for $5.00.

THIS MONTH'S AE SECTION

A practicing engineer looks at engineering education

"The structural engineer is not presently trained to create structures, but only to check their strength," stated London structural engineer Frank Newby at the recent Royal Institute of British Architects conference in Dublin. "From experience," Newby continued, "he may develop a faculty for design, for an understanding of the importance of structure and for its control within building. However, a brilliant structure does not automatically produce a brilliant piece of architecture." Newby said that he could not foresee much change in the formal attitude toward the training of engineers. "Joint training, to my mind, is essential, but will only be effective if carried out with graduate engineers, either before they enter the building industry or after a short period of practical training and with joint informed staff."

The manager's view of building performance

In order to give architects and engineers a more definite idea of what is expected in the way of building performance, the General Services Administration is developing a guide on "managing and operating criteria for Federal buildings." This guide, according to Carl E. Rantzow, assistant commissioner for buildings

management, will be based on data derived from two different evaluations of buildings. The first is made four-to-six months after occupancy and the second is a follow-up study after three-years' use.

Speaking before this year's Producers Council Annual Meeting, Rantzow said that GSA building managers check out a building on four aspects: 1) livability—traffic flow, space, noise and sun control; 2) wearability—particularly flooring and wall finishes; 3) operability—custodial, mechanical and materials handling; and 4) repairability—particularly as related to equipment.

An argument for keeping the laboratory demonstration

The "live" laboratory lecture is far from outmoded, believes Burgess Standley, laboratory design consultant, and this he feels will continue to influence laboratory design. Evidence of this, he says, is a paper, "Conveying Science by Visual Presentation," by physicist Gerald Holton, published in Education of Vision as edited by Gyorgy Kepes (George Braziller, New York, N.Y., $12.50).

"Given a lecturer whose touch is, in some real sense, tender in the manipulation of demonstration equipment, one may ask if much is lost if a student, owing to poor position or distance, cannot clearly observe the hand . . . Moreover, the presence of a large audience itself will make the handling of equipment different, and less natural, from that of a small audience. Both factors argue for small lecture rooms. This is, however, not the trend of the time. Therefore, some form of closed-circuit television in the larger classroom may help to re-establish, at least partly, the intimacy on which the interest of a lecturer himself depends. Closed-circuit television for showing a close-up of equipment being handled, as an adjunct controlled by the actual lecturer who is simultaneously active in the same room rather than as a replacement for him, seems to me a likely optimum combination for the greatest impact in large classes . . . On the instructor's side, teaching with the aid of a lecture demonstration may . . . scale his delivery to a natural speed, namely the speed which the hand will naturally manipulate the apparatus, whereas speech alone is often too fast, too bare of essential details, or, on the contrary, too dawdling. . . . Everyone can recognize clearly the difference in the way a piece of equipment is held up by someone interested in entertainment and sleight-of-hand tricks, as opposed to how it is held by a craftsman who has spent a great deal of time and trouble over the piece. But I believe we should also be able to discern consciously (as the student always discerns unconsciously) the difference, among lecturers picking up apparatus, between those who enjoy performing a demonstration and those who are bored by it, or frightened by it, or who have rehearsed it too much—as is probably the case in most filmed demonstrations."

Major conferences on air pollution and fire safety

A National Conference on Air Pollution will be held in Washington, D.C., December 12-14 at which representatives of business, labor, civic organizations, and all levels of government will be called upon to examine the current status of air pollution control and to make recommendations for control effort. The sponsor is the Department of Health, Education and Welfare.

In announcing the Conference, Secretary Gardner added, "as President Johnson pointed out last February in his Message on Preserving our National Heritage, we have only begun our work in controlling air pollution. The problem still grows at a faster rate than our combined Federal, State, and local efforts to cope with it. The Conference I am calling should help us insure that the air pollution problem, already serious, does not become critical in the decade ahead."

▪ "Safety to Life and Property from Fire" is the theme of the 1966 Fall Conference of the National Fire Protection Association in Raleigh, N.C., Nov. 14-16. Program topics cover specific occupancies such as schools, hospitals and nursing homes, as well as dwellings and industrial property; restaurant kitchen hoods and ducts and other interior features; and exposure protection and elements of building construction.

Advanced building techniques sought for military shelters

The Air Force is underwriting a search for new materials and structural concepts for low-cost, lightweight expendable shelters, exploring the use of such materials as plastic composites, fiberboard, fabrics of film structures that can be folded into various geometric shapes and enclosures. The contractor, G. T. Schjeldahl Co., will also investigate a wide range of structural techniques, among them folded plate or shell, unfolding accordion, tension, chemically rigidized and air-inflated panels.

The shelters would be used for personnel, command posts and maintenance shops under field conditions.

They are to be resistant to fire, fungus and rot, offer reflective coatings as insulation and be able to withstand wind gusts of up to 60 mph.

Standards Association changes its name and scope

The American Standards Association will now be known as the United States of America Standards Institute. The change in name is the first step in a program to enhance the prestige and value of the organization, which in recent years has had problems in getting financial support. Another objective is to achieve greater acceptance of the organization at international standards meetings.

Reflecting its increased interest in international matters was a recent meeting at the Institute called as the first step in American participation in an international language for informational signs for travelers. A French organization, the Association Francaise de Normalization, proposed the use of standardized pictograms being used on highways, at passenger terminals and other public places to facilitate travel in any language.

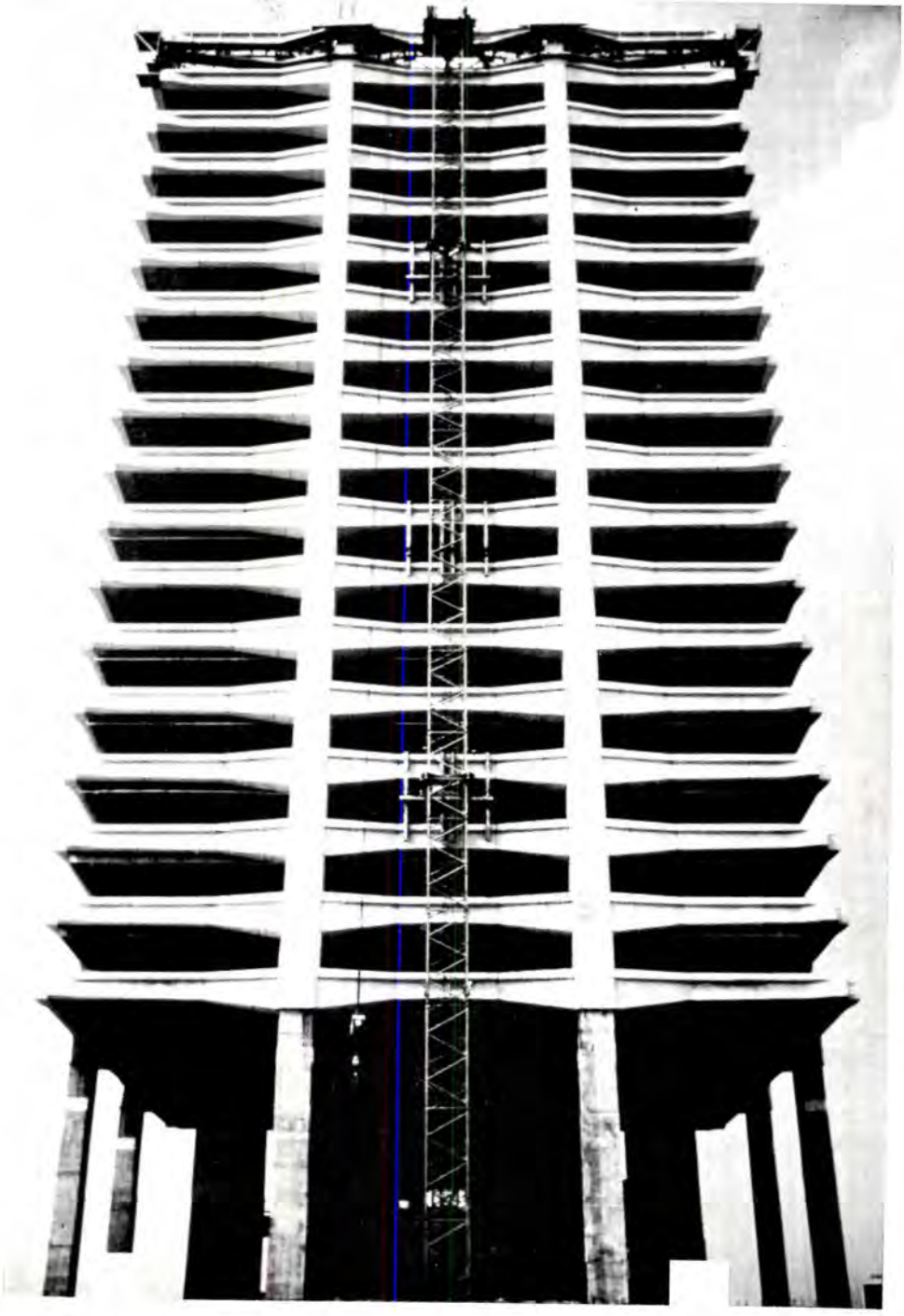
An early reaction to automation at the Met

In a story headlined, "Met Automation Won't Set Trend," The Wall Street Journal suggested that, ". . . the Met shouldn't be cast as the trend-setter in a revolutionary new age of backstage automation. As the country's most mechanized theater [see also RECORD, September] it's unique, and it's likely to remain unique for a long time."

The article noted that mechanization doesn't exist on Broadway at all, with rising, revolving and moving scenery being constructed specifically for each new show. In fairness to the Met, however, it was pointed out that labor-saving was of secondary importance there, and that a major concern was to have speed and efficiency in moving and changing sets and the ability to have seven simultaneous rehearsals with scenery. But most important was the desire for grander production effects than ever before. For example, in "Die Frau Ohne Schatten," a two-level lift raises a setting of the emperor's garden terrace up out of sight, replacing it with the setting of a dyer's hut. In the third act, an underground grotto set sinks into the floor, and the rear wagon rolls forward over it with a set of a temple.

Met technicians had very little opportunity to experiment with all their new-found mechanical devices before the opening, and they bravely weathered a couple of minor bugs. In one case the revolving stage wouldn't turn automatically, so it was pushed by hand. In another, one of the stage lifts had trouble, forcing the cancellation of several performances of La Traviata.

A knowing expression of the nature of precast concrete



There is increasing evidence that architects and engineers are finally taking more advantage of the esthetic, structural and construction potentialities of precast concrete. Case in point: the design of the new 27-story Gulf Life Insurance Company building in Jacksonville, Florida, said to be the nation's tallest precast, segmented, post-tensioned building. It was designed by Welton Becket and Associates, architects and engineers, with Richard Bradshaw as structural engineer.

Rising 430 ft above a broad podium, the tower will completely expose its sculptured structural frame on the exterior. The structural frame is supported by eight tapered, concrete columns, two on each side of the square tower.

Precast, segmented, concrete beams span the two columns at every floor and cantilever outward a distance of over 40 ft on either side. Each of the beams is being assembled from 14 precast concrete units strung together with high-strength steel cables and then placed under tension.

The cables extend through each of the beam units and through the columns, which are poured in place within a precast concrete shell as each floor is completed. Exterior faces of the beam units flare upward and inward from their juncture with the tapered columns, creating a deeply sculptured facade. An integral gutter to minimize overflow water on the vertical surface of the exposed structure is a beam detail refinement.

Completely expressing and exposing the structural frame, the window wall is set behind the inner face of the structure.

The basic structural system of the 27-story Gulf Life Insurance Company office building consists of cantilevered precast beams carried by two columns on each face. The 14 precast sections making up each of the beams are supported by a steel truss called a "strongback" until the beams have been post-tensioned. The columns are constructed by filling precast shells with poured-in-place concrete. The floor structure is comprised of double-tee units, spanning between the beams and the central core. Direction of these double-tees is east-west on one floor and north-south on the next to spread the load evenly. At the beams, the double-tees are supported by brackets welded to plates set in the beams. The photo, left, shows brackets being installed.

An architectural requirement was that the inner face of the exterior frame elements —that is columns and beams—should be in the same plane, permitting a continuous glass line inside the structural frame.

The exterior beams are being precast in segments tapered in two directions that weigh not over 15,000 lb each. The beams are being erected by two tower cranes located alongside the tower.

After the segments are shored in place, they have 12-strand tendons inserted through a sheath made continuous through the full length of the beam by the alignment of the segments similar to stringing a line of beads on a wire. This sheath is arranged in an undulated pattern in two directions so as to place the tendons in the proper location for stress control along the full length of the beam.

After the joints between the beam segments are grouted, the beams will be post-tensioned and the sheath pressure-grouted. The ends of the continuous beams, where they join the adjacent beam at the corner of the building, will be cast together in the floor structure to permit a sharing of the live loads.

The exterior columns are formed by precasting a concrete shell and then pouring in place the core of the column after the shell and reinforcing are erected. This is done to allow finish of the column to match that of the beam without the expense of special cement and sand throughout the mass of the column, as well as for erection purposes. The columns taper from a finished width of 6 ft, 9 in. at the third floor to 4 ft at the penthouse, and are 5 ft, 6 in. deep typically.

Beam system

The beams are 6 ft 9 in. deep at their maximum point, and cantilever 42 ft beyond the column center lines to the building corners where they are 4 ft deep. Prestressed floor tees with cast-in-place topping span between the beams and the core.

At the cantilever ends, the beam splays to receive the tendon bearing plates and provide sufficient area for them. The corner detail was developed to allow erection tolerances and proper conditions for the jacking equipment to successfully accomplish post-tensioning.

The beams are assembled on boom-like cantilevered strongbacks—heavily trussed falsework for aligning the precast segments. The strongbacks "fly" from floor to floor as the building rises. Each strongback consists of three sections: a center section that rests on completed columns below; and two end sections that cantilever outward from the center section so that no loads are imposed on the overhanging ends of the beams.

The beam segments are cast in Atlanta and transported by truck and rail to the building site. There tower cranes lift them into place. With a strongback in position, the assembly crew accepts beam segments in a predetermined sequence from the delivery trucks and places them end to end with the crane. Oak blocks faced with heavy cotton padding separate the precast segments from the steel of the strongback.

The contractor has four complete strongback units on the job, plus one extra center section, to speed moving the trusses from floor to floor. In raising the four trusses to the next floor, one of the tower cranes positions the extra center section first, above one of the trusses to be moved. The end sections of the lower truss are unbolted, lifted by crane, and bolted to the extra center section. This frees the center section at the lower level, and this section then is used as an extra section to raise the next strongback. When all four strongbacks are raised, the left-over center section is lowered to the ground until needed for the next lift.

The oak blocking used to keep the finished precast segments off the steel of the strongbacks provides the clearance needed to move the strongbacks after each use. Tensioning takes load off the blocks so they can be removed easily.

Floor framing

With core walls, beams, and columns in place, the precast floor tees are installed. The double-tee units are 18 in. deep and 41 ft long. To spread the load evenly on the building's eight columns, the tees are installed north-south and east-west on alternate floors. They bear on metal brackets welded to inserts in the beams, on the core walls, and on precast girders spanning between core and beams.

Where the vertical stems of the double tees rest atop previously cast-in-place core walls, the outside forms for the next core-wall lift start at the top of the double-tee slabs.

Core construction

The core is 53 ft square with two additional free-standing elements enclosing

elevators. In addition to serving as the interior support for the precast floor framing system, the core resists all of the wind forces on the building.

The main core encloses portions of the two passenger elevator banks, each with three elevators of the six per bank. The remaining six elevators are located in the two freestanding elements.

Foundations

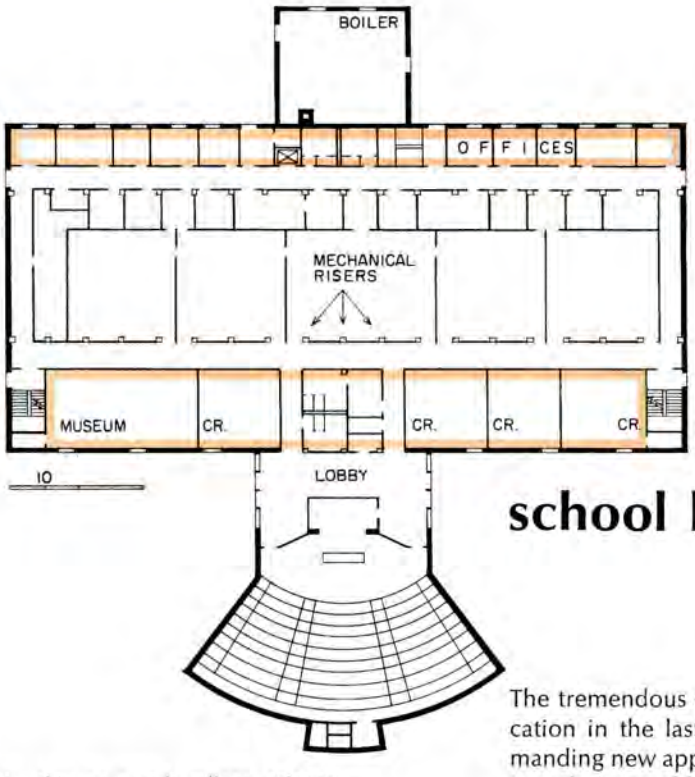
The foundation of the building presented special problems. The foundation strata is weathered limestone about 28 ft below the surface. Pile footings proved impractical, so large spread footings were used. Because this limestone is about 25 ft below ground water level and the St. John's River is immediately adjacent to the site, an extensive dewatering system of well points, sand drains, and piezometers was required. Of particular importance is the stabilizing by the dewatering of the "earth dam" between the river and the footing excavation.

The podium and concourse levels of the building, which are larger in area than the tower, are framed of precast, prestressed single tees with a 7 ft width, a multiple of the basic module of the building. The basement of the building has its slab 10 ft below the waterline, and is, therefore, designed to resist hydrostatic pressures. The unbalanced uplift of this pressure is resisted by a number of walls that cantilever off the central structural core.

General contractor for the building is Auchter Co. and precast concrete erector, George Marble Setting Co.

Kurt Lenk

The beams taper in both directions, in accordance with their load pattern, giving an interesting sculptural pattern to the facade. The glass will be installed at the inside faces of the beams, which provides an uninterrupted perimeter at each floor, while also expressing the structure. Note that the precast column shells are "lined" to carry through the horizontality of the beams and the verticality of the columns. An important construction feature of the cantilevered beam design is that the beams can be easily aligned at their ends. After this is done the ends are covered by precast facings. This design also provides room for jacks which post-tension the ½-in. tendons threaded through precast units.



In this proposed college science building all of the laboratories are grouped in the center (light gray border). Partitions may be rearranged depending on the particular needs of the time. All office and classrooms are at the perimeter of the building.

Some current trends in school laboratory design

The tremendous changes in science education in the last 10 years are now demanding new approaches to both laboratory design and laboratory furniture. The background of the new thinking and its implications were the subject of a seminar earlier this year in Miami. It was organized for the Dade County Board of Public Instruction by their consulting architects, Pancoast, Ferendino, Grafton and Skeels. Purpose of the seminar was, "to discuss the requirements of the current science curriculum, possible future developments in the disciplines and the best possible arrangement and equipment to serve the educational requirements, present and future." Following is a brief summary of the major points. Existing and projected educational science equipment was discussed by Burgess Standley, laboratory design consultant from Boston. Educational requirements were covered by teachers and administrators from the Dade County school system.

There is a tremendously greater emphasis on pupil-involved instruction in the science field. This is because studies show that a pupil learns a great deal more if he manipulates equipment himself than if he merely reads or talks about natural phenomena.

Part of the change to more pupil involvement is a change in emphasis from the accumulation of facts, to concern with the process by which facts are assimilated.

The format of new courses is to begin with a demonstration in the laboratory when starting a new subject area, and then from what has been observed, proceed to additional information in the textbook. This is in contrast to the old courses in which the purpose of the laboratory was to demonstrate what had been discussed before in the classroom.

There is a different emphasis in the chemistry laboratory, however, where the more accurate data are, the better results are. Hence, the instructor begins in the classroom, not the laboratory. On the other hand, there is more emphasis on drawing out the gifted students and providing them with facilities for experimentation where they show the inclination. This is a reason for having a science project room for carrying out this sort of work. The science research may be undertaken by individuals or by groups, where more direction is given. Given the opportunity, very often the less-gifted student will show learning progress just as great as the gifted student due to his personal involvement and motivation. These project programs make additional demands on the physical facilities, inasmuch as they require individual storage space in excess of what has ordinarily been provided.

One example of the projects approach cited: Laboratories are grouped around a common projects and storage area. The building has an intermediate area for directed projects as well as a projects area for more advanced individual research. In the projects area there are no lines drawn between the disciplines on the assumption that several disciplines might be involved in the same project, so facilities are provided at all work stations for all disciplines.

In the Dade County School System, science at the seventh grade level is being taught by television. Eighth and ninth grade science is taught in individual classrooms. There is a definite trend at seventh and eighth grade levels toward more laboratory work by the students themselves. Equipment used is generally very basic and work stations would not

all require the utilities that must be furnished at senior high level. However, there would have to be some facilities in the room of this nature. Most have a demonstration table for the teacher which is fully equipped.

Another significant development is the increasing interdependence of the disciplines—physics, science and biology. For example, students in biology may need to use equipment from the physics department to understand approaches in biology. Also the concept of probabilities might require the mathematics teacher to make the presentation. This would call for a flexibility of structure where a space could be opened up large enough to bring the whole group together for instruction. Then during the lab periods the class would return to smaller groupings for closer supervision.

Thus the feature that will probably have the most effect on the physical plant is the development of a more or less universal lab rather than separated disciplines of the traditional educational plant.

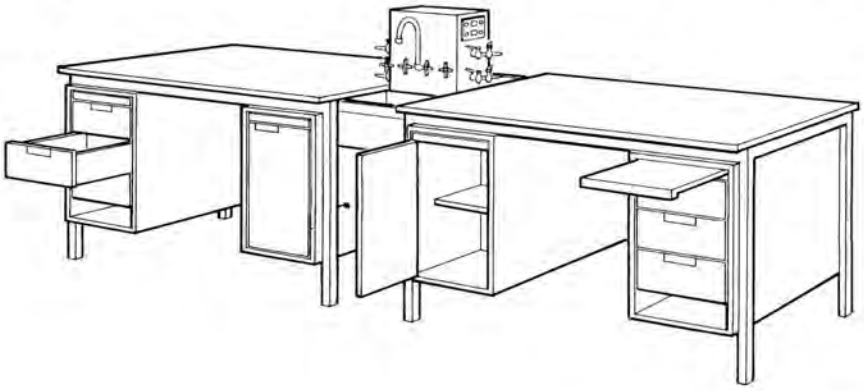
Individual study programs have been introduced at the college level. An example cited is a program at Purdue University. In this case the student pursues his studies and research where his interest leads him. He does his laboratory work not necessarily within a group, but when his schedule permits. Arriving at a laboratory which is open 40-50 hours a week he simply finds an unoccupied cubicle and does the lab work his studies require on an individual basis. The lab work is programmed and he receives individual instruction with the help of audio-visual aids, film and tapes; then he performs experiments or manipulates equipment. Then he may be instructed by tape to go to a central table for additional work when he has finished the program in individual project type curriculum.

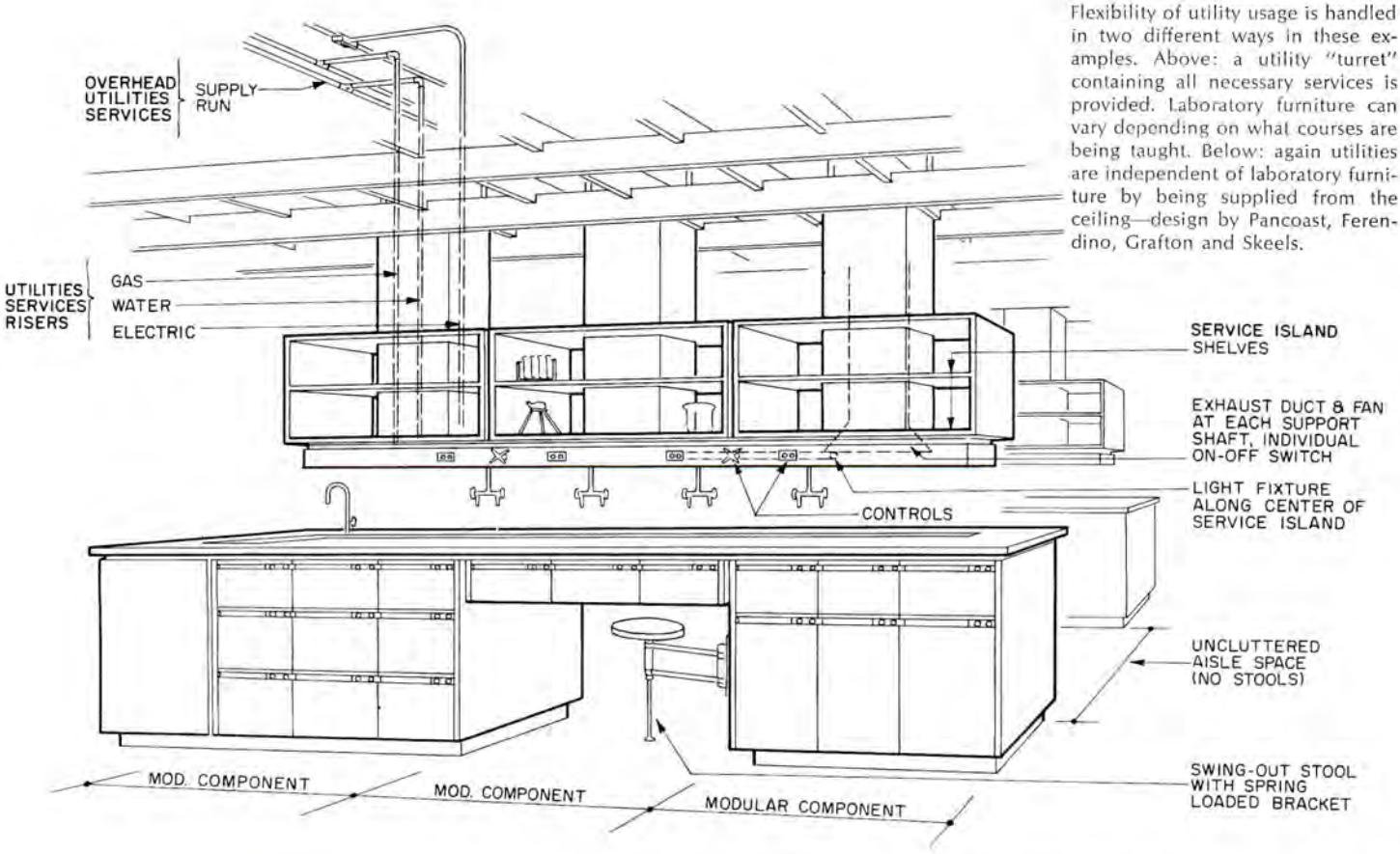
Cost of science facilities should not be approached so much from the standpoint of total cost of a science facility or even the cost per unit of instruction—instead higher costs for science could be justified better from the standpoint of high utilization made of the facility by careful programming.

Portable fume hoods and movable science laboratory desks are available from many manufacturers, but the cost is higher than for conventional. Such equipment might be used when the increased cost could be justified by greater utilization. Flexible locations of science tables is limited to great extent by the need for a sink and the plumbing code requirements for the waste from that sink.

One answer to greater utilities flexibility is a utility turret at the center of a group of tables (see below). These tables may be rearranged without disturbing the utility turret to accommodate a different science discipline. Storage elements are modular and are interchangeable within the table framework.

Another development—in chemistry laboratories where the storage of labware has always been a serious problem, the development of micro-labware and of lightweight packages has alleviated this problem. The package or suitcase opens up new possibilities for storage more remote from the actual work table and consequently greater utilization of the expensive laboratory and its utilities.





Flexibility of utility usage is handled in two different ways in these examples. Above: a utility "turret" containing all necessary services is provided. Laboratory furniture can vary depending on what courses are being taught. Below: again utilities are independent of laboratory furniture by being supplied from the ceiling—design by Pancoast, Ferendino, Grafton and Skeels.

New theory for what's behind built-up roofing failures

By Kenneth Tator
Kenneth Tator Associates

Ten years of field research on weathering of built-up roofing suggest a whole new theory to explain degradation of the roofing membrane.

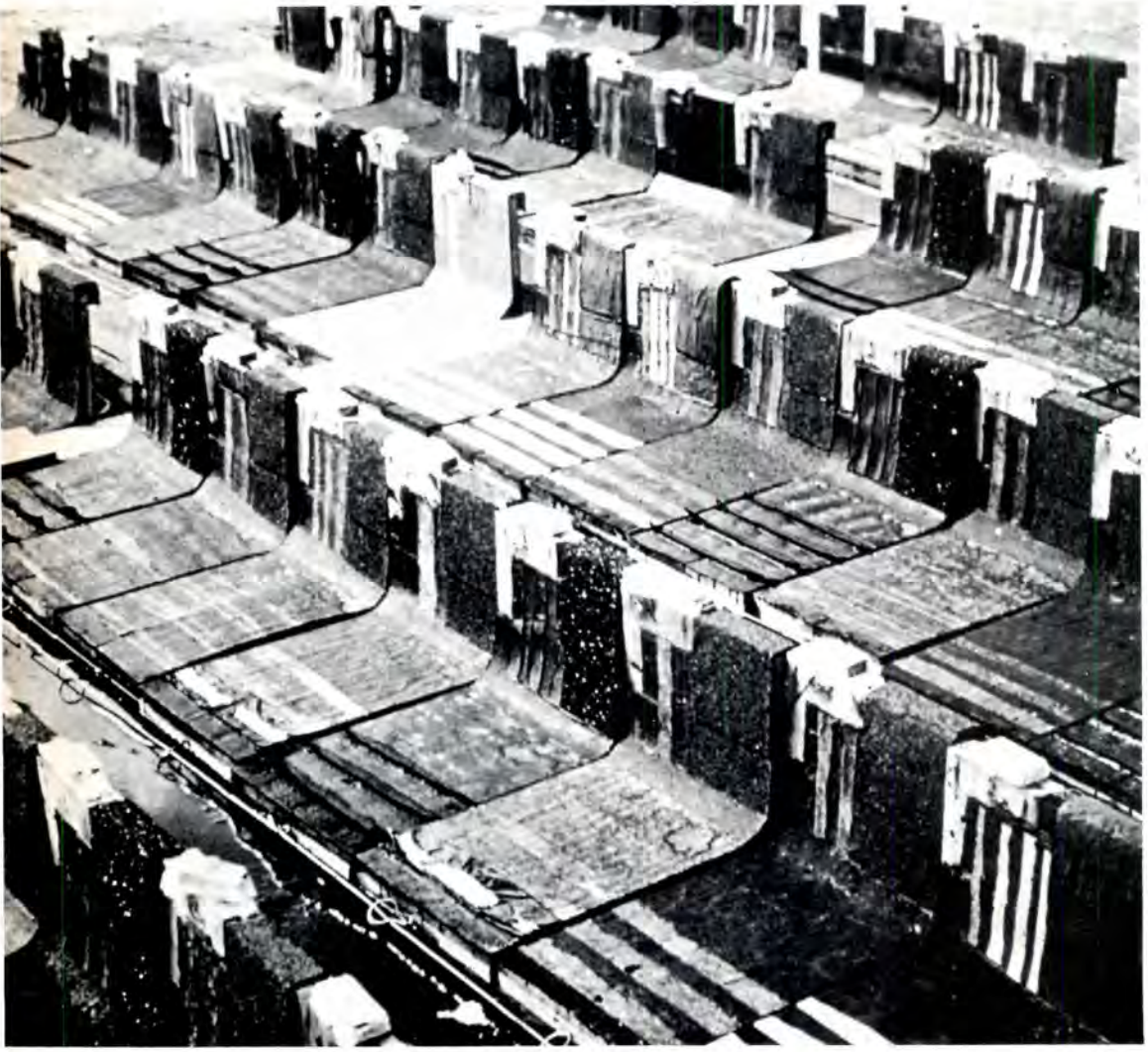
While considerable attention has been focused on the effects of structural movement, there has been little study of what happens to the roofing as it goes through the seasonal cycles—exposed to the boiling sun, to rain, to snow and to freezing temperatures.

New field and laboratory research both point to moisture as a basic source of trouble. The potentially destructive effects of water vapor inside buildings has been known for some time, and has led to the use of vapor barriers below insulation to deter vapor from entering the roofing membrane. What has not been realized, however, is that the bitumens used in built-up roofing are not completely impervious to the passage of water vapor. Thus, if water is absorbed by the roofing felts during the winter months, spring and summer heat will cause expansion of this moisture, exerting appreciable internal pressure within the built-up roofing system, which can result in blistering, buckling and even delamination of the roofing plies.

The research has comprised: 1) surveillance of actual roof performance, 2) evaluation of test samples at weathering stations in hot and cold and humid climates, 3) simulated weathering studies, and 4) laboratory investigations of moisture vapor permeation, moisture absorption and progressive oxidation.

■ The research showed that: 1) Within the same construction of number of plies and coating, rag felts seemed more prone to blistering, buckling and impairment of interply and base adhesion than asbestos and glass felts; 2) within any one construction and type of felt there was considerable variation in blistering, buckling and adhesion depending upon the type of coating used; and 3) blisters rarely occurred in the weatherometer exposure, even of coating systems which blistered rapidly on roof exposure.

The propensity of organic felts to absorb and retain moisture is much greater than for inorganic felts; the organic felts, however, have a greater ability to resist tension splitting by virtue of their greater elongation, except when their tensile strength is impaired by direct exposure to weather, industrial contaminations or ultraviolet rays.



Since conventional methods of testing roofing materials did not seem to reproduce the range or severity of weather conditions found in practice, a different kind of test panel was developed. Deceptively simple, the panel (called the KTA roofing system panel) is merely an "L"-shaped construction of wood to which the roofing sample is applied. As the wood alternately absorbs moisture and dries out, it pumps moisture into and out of the roofing sample. The panel also swells and shrinks, applying tension or compression to the roofing. Although this method of applying stress to the roofing does not correspond to the frequency or time of application of temperature or structurally-induced stresses, it nonetheless applies a sufficient magnitude of stress to indicate how roofing failures develop. Test panels such as those shown here, have been tested over an eight-year period in such extremes of weather as Massena, N. Y. and southern Florida.

The effect of weather cycles

To understand what happens to roofing in service, it is necessary to examine its behavior through the various weather cycles. The sole function of the bitumen (asphalt or pitch) is to serve as a waterproof coating for the roof deck. The function of the felt is to reinforce the bitumen to help it withstand internal stresses and external abuse.

As initially applied, the consistency of a bitumen may range from a slowly flowing viscous consistency to a plastic deformable consistency. But consistency will change radically with temperature. Hot summer temperatures will cause the bitumen to soften—even to the point of liquifying. Cold weather temperatures will make the bitumen rigid to the point of brittleness. Furthermore, any bitumen will progressively become harder due to weathering, until, at the end of its useful life, it will be in a hard, brittle condition.

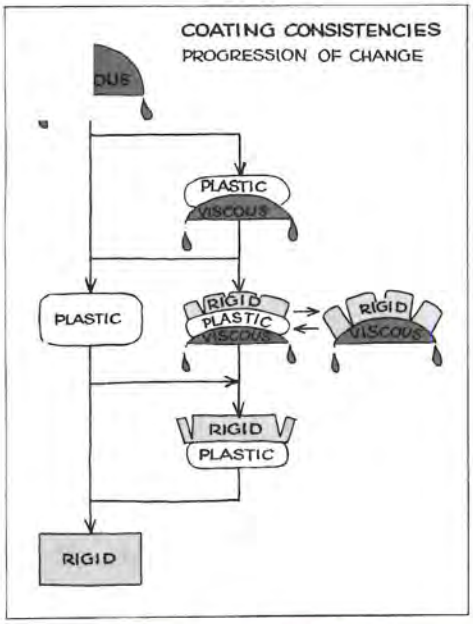
This progressive, permanent hardening is due to many changes within the bitumen—including oxidation by sunlight and weather, and progressive evaporation of the plasticizing components. This latter effect sets up shrinkage stresses within the bitumen during hot weather exposures (see below).

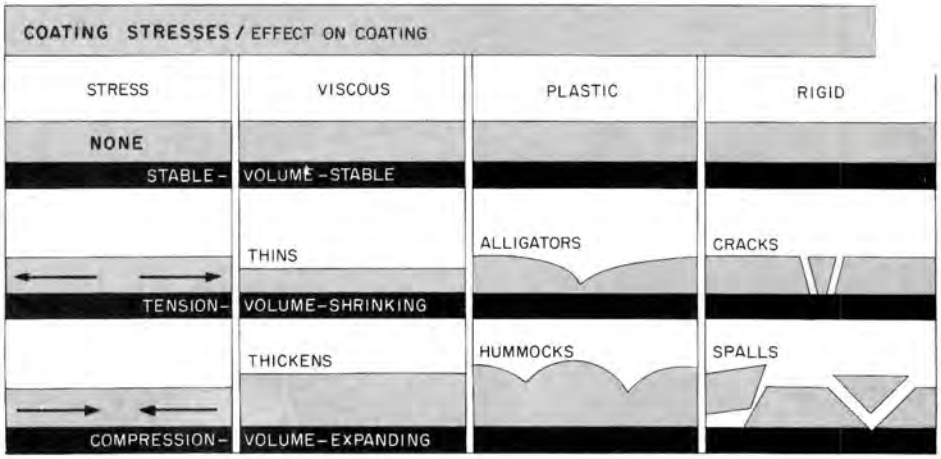
What happens to the bitumen when external stresses are imposed upon it when it is in various consistencies? If the bitumen is in a viscous condition, the stress will be absorbed harmlessly by flow. If in a plastic condition it will form hummocks under compressive stresses and will stretch under tensile stresses. In the rigid, brittle condition, the bitumen will crack and spall, losing its waterproofing continuity. Thus, the vital bitumen coating can be damaged by imposed stresses when aged or at low temperatures, weakened by them at normal temperatures, and unharmed by them at higher temperatures.

If the reinforcing felt is to do a thorough job of strengthening the bitumen, it must be able to resist the deteriorating effects of moisture when cracks ultimately occur in the bitumen, and it also must be impervious to the passage of water vapor through the bitumen before cracks occur. (Actually, no bitumen is a completely positive vapor barrier. While the permeability may seem inconsequential, it can be shown that this can amount to as much as one quart of water per 100 sq ft of roof in six months' time.)

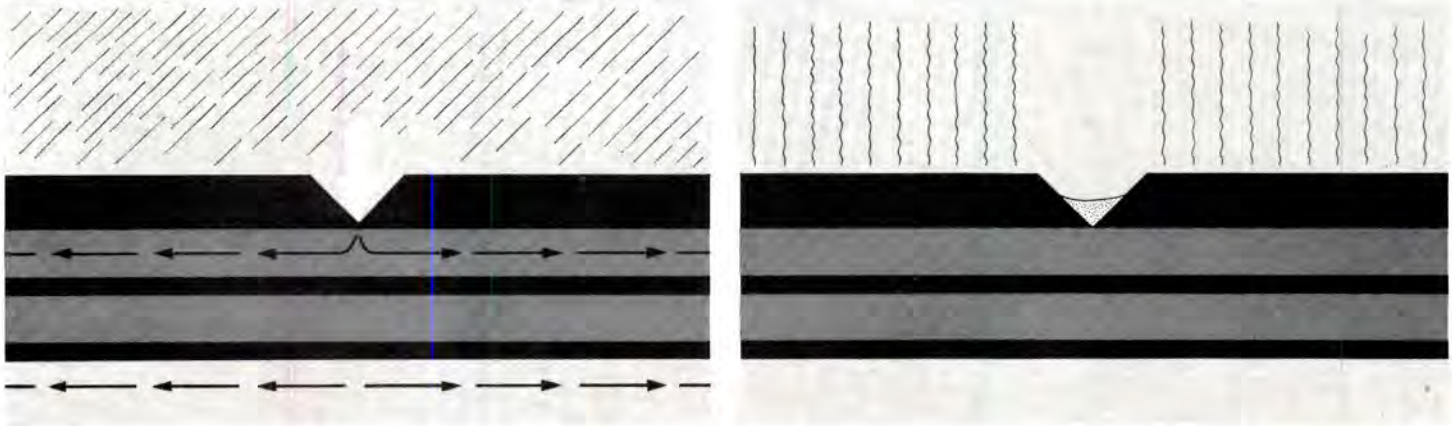
In the winter months, the built-up roof will pick up considerable moisture since there are many periods of almost constant wetness. If the surface has cracked and spalled, liquid moisture can penetrate to the felts.

During the following warm days of spring and hot days of summer, the fractured bitumen may heal itself partially or completely, sealing moisture into the built-up roofing system. Then, as described earlier, the expansion of moisture





As applied, the basic consistency of roofing bitumen ranges from a slowly flowing viscous state to a plastic state. In summer it may liquify, and in winter become rigid. What happens to the bitumen as tensile or compressive stresses are induced due to temperature or building movement depends on its physical state. This is illustrated in the drawing above. If the top layer of bitumen cracks, moisture may enter the roofing felts as indicated by the sketch below, left. Then if the crack becomes healed during the summer weather, the moisture may be entrapped and lead to trouble.



due to heat will start its destructive effects on the roofing membrane.

Recommendations

It should be apparent that even those systems comprised of the best materials and applied with the greatest of care are subjected to natural forces of considerable magnitude. Accordingly, the following precautions should be observed:

New Roofing:

1. Use coating with lowest rate of moisture vapor transmission. Most hot applied asphalts and pitches qualify.

2. Use felts and other components of low equilibrium moisture content; glass, asbestos and most plastic sheetings meet this qualification.

3. Where high humidities prevail within the building, or where the deck material is hygroscopic, such as gypsum, use a vapor barrier over the deck.

4. During application, be sure that all roofing materials are adequately protected from rain and other moisture, not only during storage prior to use, but also during application by specifying that all applications started in one day must be completed within that same day and/or before any precipitation.

5. Prevent prolonged exposure to standing water by adequate roof drainage.

6. If insulation is used, provide means of venting to avoid moisture accumulation within it.

7. Avoid overheating of the bitumen during application, to avoid loss of its life extending plasticizing components. Kettle temperatures should not exceed 475 F for asphalt, or 400 F for pitch.

For below-zero climates:

1. Use dead level asphalt wherever slopes permit.

2. Use felts and other reinforcing components which possess greatest elongation without rupture. This property is currently found to the greatest degree in the moisture susceptible materials, so these will be but a compromise in any but predominately cold-dry climates.

3. Consider the use of heat absorptive surface coverings.

4. Avoid as far as possible, or relieve, all external sources of stress.

For warm, humid climates:

1. Dead level bitumen will be advantageous only if precautions are made to stabilize flow under heat, such as:

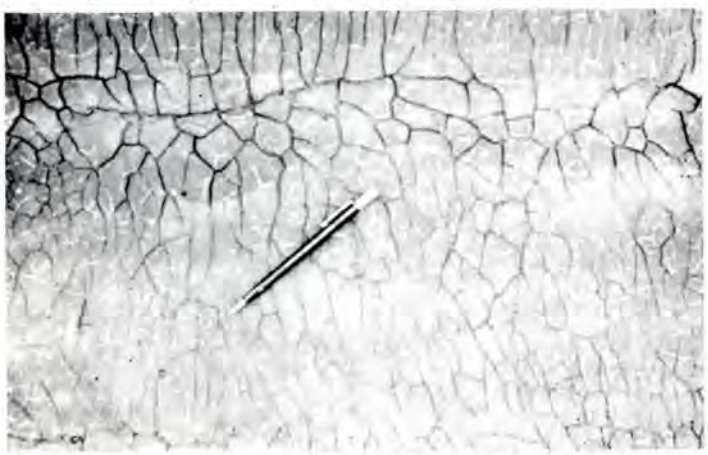
a. provision of flow-impeding top course, such as gravel or cap sheet,

b. provision of anti-drip sheets over deck joints, such as vapor barrier, taped insulation, or dry sheets, and

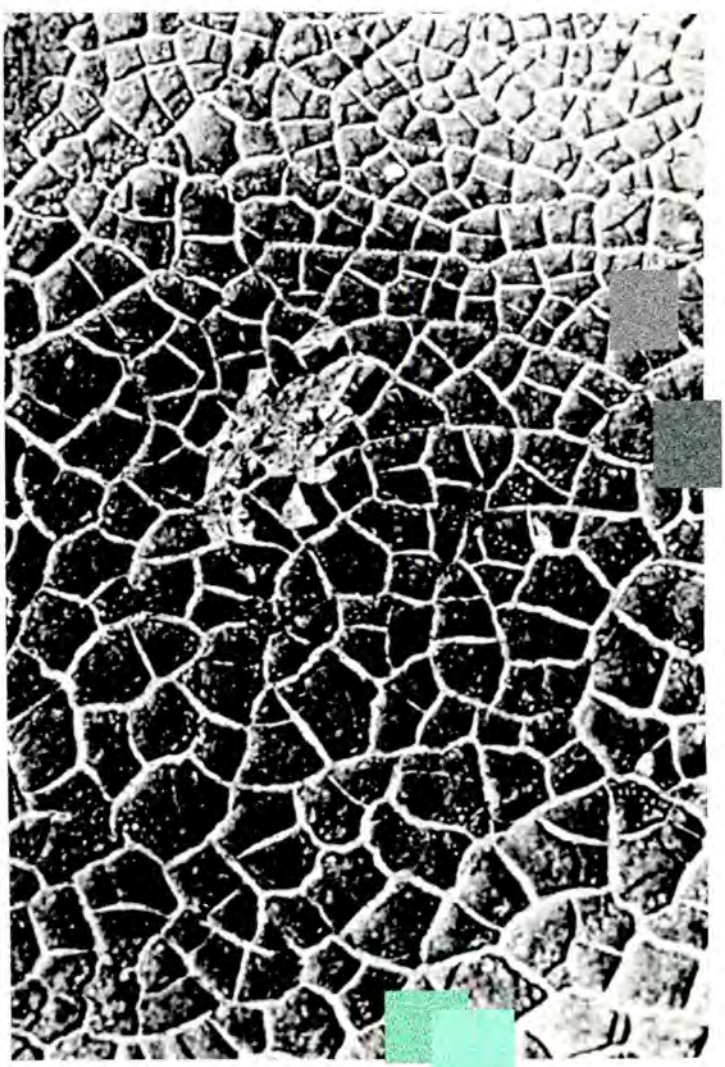
c. adequately high gravel stops at all eaves.

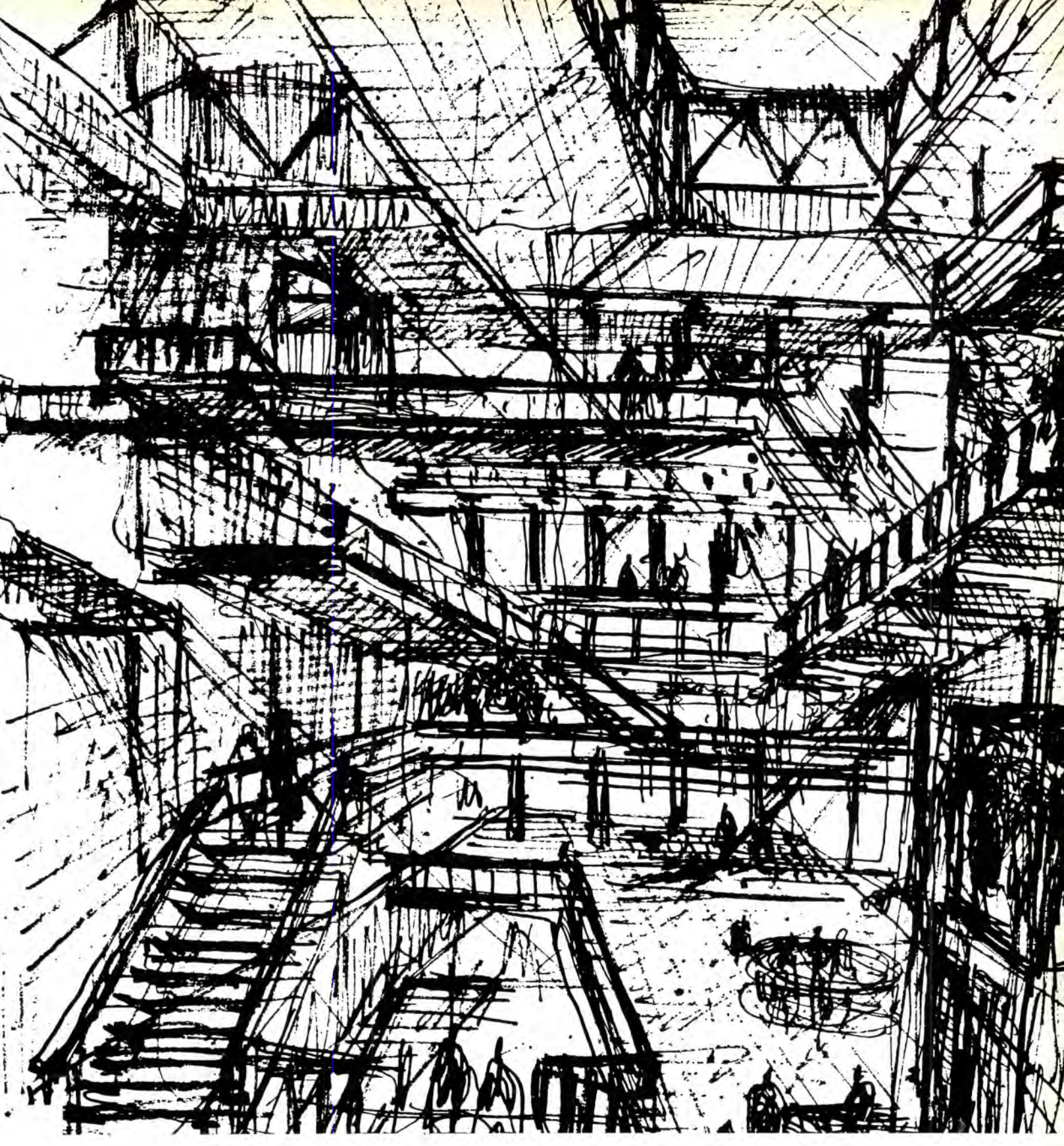
2. Use heat reflective surfacing.

This article is based on a paper which forms part of a symposium on built-up roofing sponsored by Owens-Corning Fiberglas.



High temperatures (solar heat or too high kettle temperatures during application) can cause loss of volatile components in the bitumen, resulting in shrinkage of the bitumen and exposure of felts. This can be recognized by the pattern illustrated above. Then during winter weather, cold embrittlement cracks develop (shown below). The heat of summer turns these cracks into the familiar alligatored surface seen in the photo, right.





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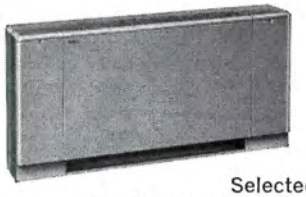
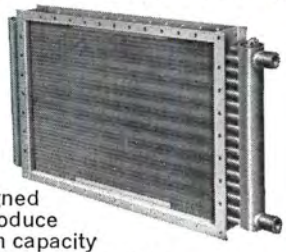


Selected as remote room conditioners for all the guest rooms ... modern, functional, only 8½" deep. Four types—floor, basic, ceiling and hideaway—from 220 to 1240 cfm.

McQUAY TYPE "5WH" WATER HEATING DUCT COILS



Designed to produce high capacity with limited water quantity. Standard or custom coils for any requirement or design load.

HOLIDAY INN, TEMPLE, TEXAS Innkeeper: Harry F. Lane, Temple, Texas.
McQuay Rep.: J. P. Ashcraft Co., Lubbock, Texas

Holiday Inn® OF AMERICA
THE NATION'S INNKEEPER®
REG. U. S. PAT. OFF.

Many Holiday Inns throughout America are McQuay equipped. Here are some of them ....

Ashville, N.C.
Binghampton, N.Y.
Bloomington, Minn.
Buffalo, N.Y.
Cedar Falls, Ia.
Chillicothe, Ohio
Cocoa Beach, Fla.
Columbus, Ohio
De Kalb, Ill.
Elizabeth Town, Ky.
Elyria, N.Y.
Fort Dodge, Ia.
Fort Wayne, Ind.
Greenville, N.C.
Greenville, S.C.
Joliet, Ill.
Lawrence, Kans.
Lorain, Ohio
New Bern, N.C.
New Orleans, La.
Paducah, Ky.
Pine Bluff, Ark.
Rockford, Ill.
Roswell, N.M.
Sandusky, Ohio
Seymour, Ind.
Spokane, Wash.
Topeka, Kans.
Waycross, Ga.

MAKE THE SEASONS COME TO YOU

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Box 1551, 13600 Industrial Park Blvd.,
Minneapolis, Minnesota 55440
AIR CONDITIONING • REFRIGERATION
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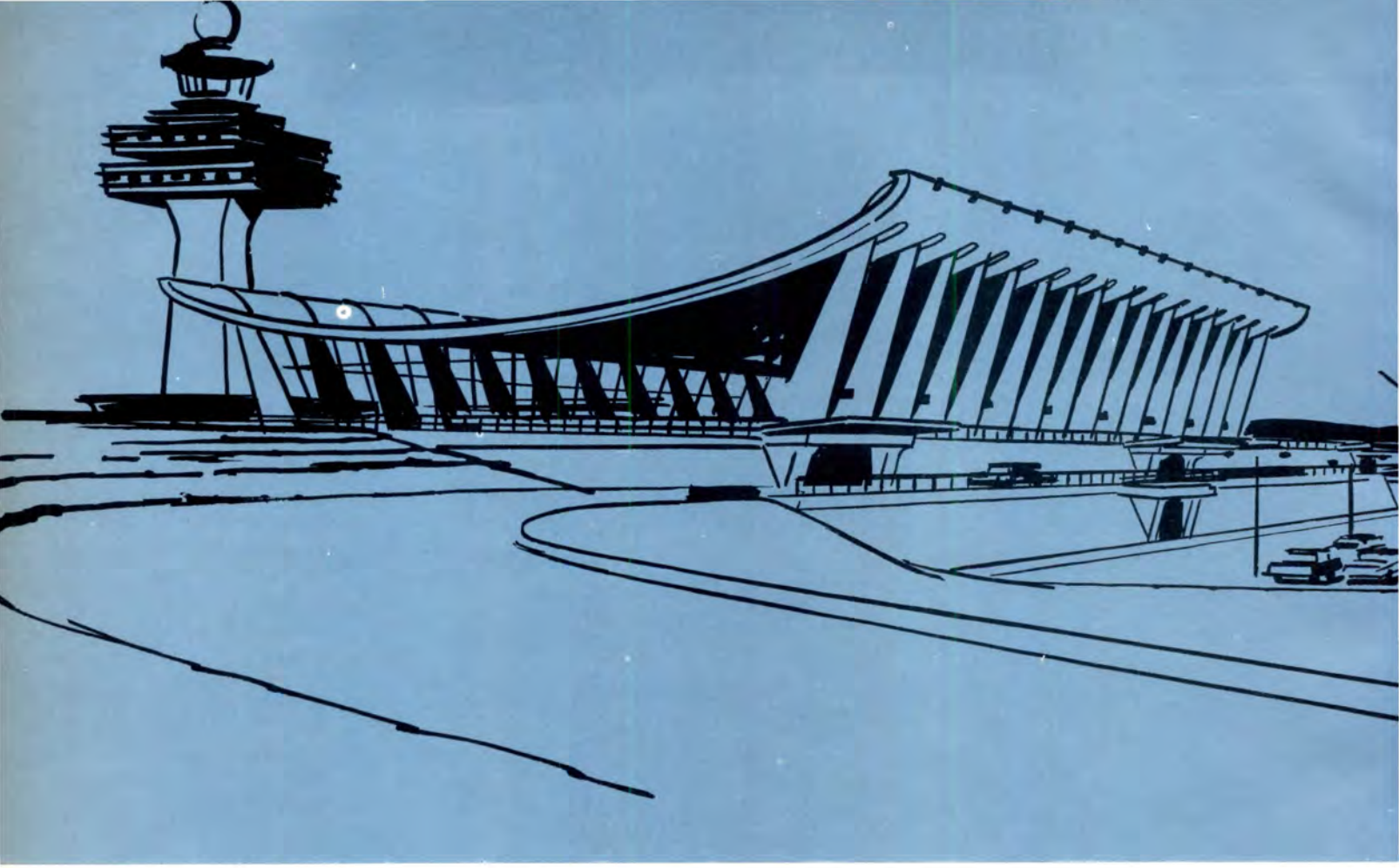
MANUFACTURING PLANTS AT FARIBAULT, MINNESOTA • GRENADA, MISSISSIPPI • VISALIA, CALIFORNIA

For more data, circle 87 on inquiry card



Honor to be in Honored Company

Eero Saarinen & Associates received FIRST HONOR, awarded by the 1966 Honor Awards Jury of the AIA, for their design of Dulles International Airport Terminal Building, Chantilly, Virginia.

The jury in selecting this as one of only three such awards, commented in part "To a remarkable degree Dulles epitomizes the qualities of vigorous, free and graceful movement which we associate with flight. The principal structural component — the pylons and roof — have a sculptural quality which dramatizes their function."

Lockwood Mortise Locks were the choice for this honored building for the very reasons stated above — outstanding beauty and functional dependability.

We would be honored to have **your** next building "Locked up with Lockwood."

AIA
FIRST
HONOR

Eero Saarinen & Associates

Architect: Eero Saarinen & Associates
Contractor: Humphreys & Harding
Hardware Supplied by: W. T. Weaver Company

LOCKWOOD HARDWARE DIVISION
INDEPENDENT LOCK COMPANY ILCO
Fitchburg, Massachusetts

For more data, circle 88 on inquiry card

Combination lighting, air-handling troffers in the new 31-story Illinois Bell Telephone office building can easily be changed from two-lamp fixtures to four-lamp fixtures, raising the footcandle level from 85 to approximately 150. Similarly, the air-handling unit can be adjusted to deliver from 50 to 120 cfm of tempered air.

To change from a two-lamp to a four-lamp fixture it is necessary only to snap open the lens, shorten the special telescoping wiring channel, and unlock the wing bolts which hold the channel in the troffer. The entire channel, containing sockets, ballasts and wiring, is held by a chain while the workman unhooks wiring.

The flanged aluminum frames of the troffers support the perforated metal ceiling panels, eliminating the need for an exposed grid. Troffers are equipped with gaskets to prevent seepage of dirt over the lens when the troffers are being used to exhaust air.

Lighting troffer design for changing space needs

A key element in providing flexibility for change in a new 31-story office building for Illinois Bell Telephone Company is a specially designed air-handling lighting troffer which can provide either 85 or 150 footcandles and be adjusted to deliver from 50 to 120 cfm of tempered air. The 970,000-sq-ft structure, in downtown Chicago, will be completed this year.

Designed by Holabird & Root, the building is divided into 6-ft modules which can be converted inexpensively in any combination into a separate office for general clerical work; for artwork, engineering drawing or drafting requiring a high footcandle level; or for high-heat-gain data processing equipment.

The air-handling troffers, designed especially for the project by the Benjamin Division of Thomas Industries Inc., are equipped with two 4-ft fluorescent lamps to provide an average maintained level of 85 footcandles. The entire wiring channel and socket assembly of the fixtures is a special telescoping type that allows the power assembly to be removed as a unit.

At present, 85 footcandles of illumination is considered adequate by Illinois Bell for illuminating general office areas. Should higher lighting be required in the future (it is being used now in specialized areas of the building), the two-lamp holder can be replaced with a four-lamp holder to provide a footcandle level of approximately 150.

The smaller unit is removed from the troffer and the wiring disconnected. The larger unit is then wired in, telescoped out to fit the troffer and locked into place. The 277-volt wiring being utilized for the 2-lamp arrangement is adequate for four lamps, so that, in making the changeover, the ceiling need never be opened so far as the lighting is concerned.

Of course, increased lighting means an added heat gain. But air-handling lighting troffers provide an easy solution. Each fixture can be adjusted to deliver from 50 to 120 cfm of tempered air. Further, the ducting arrangement above the troffers is designed so that any troffer in

the building can be connected to or disconnected from a supply air duct or an exhaust duct with relative simplicity.

(An exception to the supply-exhaust flexibility involves the perimeter of the building, where induction air-handling units rather than troffers are used to bring in tempered air. Here, the troffers are connected to exhaust air ducts only. All heating, cooling, and ventilating chores within the remaining part of the structures are, however, handled by the lighting fixtures.)

While all lighting troffers are equipped for connections to air ducts, only 50 per cent are actually connected at present, except in electronic data processing areas where more cooling is needed. In general office areas, approximately every other troffer is connected to ductwork. Thus, a 12 ft by 12 ft office has two fixtures supplying or exhausting air, rather than four.

Should the partition walls be moved back to extend the office to, say 18 by 18 ft, different fixtures could be connected to air-handling ducts—thereby avoiding drafts, as well as increasing thermal control capacity. Flexible ducting is used to connect air-handling boots to main ducts, and it is a relatively simple matter to disconnect a boot from a fixture and attach it to an adjacent one.

The lighting fixtures utilize a "floating" lens in an anodized aluminum frame. They have swing bar hangers plus the removable housing for ballasts and sockets. The flanged aluminum frames of the fixtures were designed to support 2 ft by 2 ft and 2 ft by 4 ft perforated acoustical panels which make up the ceiling. Thus, they eliminated the need for gridwork, providing a cleaner-design ceiling free from projections which would collect dirt and increase maintenance costs. The troffers are also equipped with special gaskets which prevent seepage of air over the lens to cause a dirt build-up when the troffers are being used to exhaust air.

Further, air-handling boots are recessed an inch above the bottom of the ceiling so that the slotted aluminum extrusion, rather than the air-handling boot itself, becomes the air diffuser. This factor is also expected to play a role in reduced ceiling maintenance costs.

Troffers are suspended from steel channels and are locked in place by means of turn-down screws in the swing bar hangars. Troffers are equipped with prismatic lenses for light control. The structural floor is cellular metal decking, fire-protected by sprayed-on insulation.

Air distribution is by a dual-duct system. From the mixing boxes located in each zone, air goes to air diffusers mounted on the sides of the troffers. At present only half of the troffers are used to either supply or exhaust air. If necessary, present connections can be shifted to suit a new partitioning arrangement.

For more information circle selected item numbers on Reader Service Inquiry Card, pages 315-316

ENTRY DOORS / Antique carvings reproduced on panels have been applied to either standard- or special-sized finished or unfinished doors. The furniture finish is the result of a deep base color and an original aging technique. A polyurethane sealer protects against the weather. ▪ Palazzo Panels, Santa Ana, Calif.

Circle 300 on inquiry card

AUTOMATIC DOOR LOCKS / An automatic pushbutton lock system eliminates keys, keyholes, tumblers. One 4-number combination can unlock all doors in a home, office or building. Ten pushbuttons offer 10,000 possible combinations that may be easily changed. ▪ Preso-Matic Lock Co., Inc., Lyons, Ill.

Circle 301 on inquiry card

GARAGE DOOR OPENER / An electronic garage door opener is designed for single- or two-car garages with one-piece solid doors. A touch of the portable push button opens, closes, and securely locks the door automatically. The Electro-Lift also controls the garage light. The transmitter requires no car installation. ▪ Perma-Power Company, Chicago.

Circle 302 on inquiry card

HOSPITAL TELEVISION SYSTEM / A fully transistorized electronic system provides both audio and video intercommunication in addition to furnishing individualized TV entertainment for patients. The system requires only a single coaxial wire. A balanced arm keeps the miniature set at the correct viewing position and within the patient's reach so that he can make all set adjustments without the aid of a nurse. ▪ Bell Hospital Systems, Inc., Bridgeport, Conn.

Circle 303 on inquiry card

TRIO KITCHEN SINK / This sink features two washing compartments and a high-level rinse and scrape compartment designed for food disposer installation. The unit is made from cast iron, acid-resisting enamel and is available in over 70 colors. ▪ Graning Company, El Monte, Calif.

Circle 304 on inquiry card

LIGHTING FIXTURES / Over 100 fixtures are available in a line that includes recessed and regressed downlights, Alzak downlights, wall washers, many kinds of surface-mounted units, and various units for outdoor use. Shown is the low-surface-brightness Alzak fixture for use where a fairly high level of illumination but an inconspicuous light source are required. Fixtures also can be made to meet architect's special requirements. ▪ Swivelier Company, Inc., Nanuet, N.Y.

Circle 305 on inquiry card

MOBILE FIELD OFFICE / A light delivery van fitted with a retractable "Turtle Top" and mobile office equipment can be used for on-site and site-to-site business. The unit has storage room for files, plans, and equipment plus a refrigerator and a built-in bank. ▪ Work-N-Play Division, Independent Protection Co., Inc., Goshen, Ind.

Circle 306 on inquiry card

more products on page 205

OFFICE LITERATURE

For more information circle selected item numbers on Reader Service Inquiry Card, pages 315-316

GENERATORS / A 14-page illustrated bulletin describes 19 units for gas, No. 6 or lighter oil, or combination gas/oil firing. The units have ratings from 20 through 750 Bhp. Corresponding MBh ratings are 670 through 25,106. High-pressure models are designed for 150-lb steam W.P.; low-pressure units for 15-lb steam and 30-lb. water W.P. ▪ American Standard, Industrial Division, Detroit.

Circle 400 on inquiry card

INSULATED PIPE / A 40-page illustrated brochure describes six different systems for underground or overhead applications. Detailed specifications as well as information on conduit sizing, trenching, insulation and recommended field-installation procedures are included. ▪ RicwiL, Incorporated, Barberton, Ohio.

Circle 401 on inquiry card

CONCRETE PIPE / An 8-page illustrated bulletin explains uses in sanitary sewers, culverts and storm drains. The bulletin explains the different types of flexible joints used for pipe installations and lists office locations. ▪ United States Concrete Pipe Company, Cleveland.

Circle 402 on inquiry card

LOW-VOLTAGE EQUIPMENT / The Summer 1966 *Buy Log* is a 212-page catalog listing such products as load centers, safety switches, molded-case circuit breakers, panelboards, grouped metering equipment, switchboards, busway, ballasts, and many more. ▪ General Electric, Plainville, Conn.

Circle 403 on inquiry card

OIL-FIRED BOILERS / A 4-page brochure explains the high heat-transfer principle of the Thermo-Oval-Tube oil-fired boilers. There are illustrations and descriptions of the functional components plus specification charts. ▪ Thermo-Dynamics Corp., Schuylkill Haven, Pa.

Circle 404 on inquiry card

LABORATORY EQUIPMENT / A 4-page brochure covers the complete laboratory equipment line and contains data and illustrations on both ground and compression-type laboratory stops. In addition, the brochure discusses tube washers and heavy-duty aspirator pumps for moving heavy fluids. ▪ Haws Drinking Faucet Company, Berkeley, Calif.*

Circle 405 on inquiry card

GRILLES / A 12-page illustrated bulletin describes an aluminum grille system of basic modules and interchangeable components from which original grille designs may be developed. Uses include solar screening, decorative screening, and refacing. ▪ Construction Specialties, Inc., Cranford, N.J.*

Circle 406 on inquiry card

STEEL PRODUCTS / Five fact sheets provide information on flat rolled steel in residential construction. The subjects covered are: steel bathtubs, steel doors, galvanized steel windows, galvanized steel ducts, and galvanized steel raingoods. ▪ American Iron and Steel Institute, New York City.

Circle 407 on inquiry card

ACRYLIC SHEET / A 16-page booklet describes the process for continuous casting of acrylic sheet in unlimited lengths. The booklet defines the significance of this process to architects and notes some interesting applications that have already been completed. ▪ Swedlow Inc., Garden Grove, Calif.

Circle 408 on inquiry card

SAUNA / Two publications, an illustrated data sheet and a specifications sheet, give information on the sauna heater and the sauna room. ▪ Wesco, Northwest Foundry & Furnace Co., Portland, Ore.*

Circle 409 on inquiry card

SCIENTIFIC FURNITURE AND EQUIPMENT / A 124-page catalog describes the full line of wood products for schools and colleges. Besides picturing and detailing thousands of items, the catalog also includes data and suggestions on laboratory planning and layout to achieve maximum efficiency and use of space. Letterhead requests. ▪ Labcraft Division, Metalab Equipment Company, 270 Duffy Ave., Hicksville, N.Y.

BRICK / A 16-page brochure illustrated with color photographs of installations shows possible effects achieved through the varied use of brick. Drawings provide dimensions of units and diagrams show detail for joints, junctions, pilasters, provisions for sash, and various construction anchorages. ▪ Harbison-Walker Refractories Company, Pittsburgh.

Circle 410 on inquiry card

GROUND WATER SYSTEMS/A 16-page illustrated booklet on permanent pumping systems covers such areas as water supply and control, soil stabilization, pollution control and artificial recharge. ▪ Moretrench Corporation, Rockaway, N.J.

Circle 411 on inquiry card

ZINC CORROSION/A guide to the behavior of zinc exposed to a number of different environments examines many aspects, from the formation of surface films and the mechanism of corrosion to the behavior of galvanized steel and zinc alloys. Letterhead requests. ▪ American Zinc Institute, 292 Madison Ave., New York City. 10017

DOUBLE WALL MOVABLE PARTITIONS/ An eight-page color brochure illustrates a partitioning system for offices, industrial buildings, hospitals, laboratories and schools. The brochure explains that the system, which allows independent faces, permits use of any color, any texture, any type of wood, wallboard, glass or plastic and in any thickness from ¼ in. to ⅝ in. The metal skeleton can be erected and wired before panels are installed, and damaged panels can be replaced without disturbing adjacent panels. ▪ L. A. Darling Company, Workwall Division, Bronson, Mich.*

Circle 412 on inquiry card

FREEZERS-REFRIGERATED WAREHOUSES / A Working Data Catalog for sectional walk-in coolers and freezers/refrigerated warehouses reports the efficiency of units operating at temperatures as low as −50 deg and as high as +200 deg F. The catalog contains complete, detailed architectural specifications, diagrams, charts, and photos. ▪ Bally Case and Cooler, Inc., Bally, Pa.*

Circle 413 on inquiry card

CEDAR PANELING AND SIDING / A full-color brochure, shows several applications for "Lam-Loc Pecky Cedar," in both interior and exterior applications. Available in three faces—re-sawn, smooth, sandblasted—and two edge designs—square-cut or tongue and groove. ▪ Ed Fountain Lumber Co., Los Angeles.

Circle 414 on inquiry card

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

more literature on page 276

there are some wall coverings we don't make

Cliff dwellings do pose problems for wall beautifiers, and not even Laminating Services is much help. But we're more help than anybody when you need to create impressive interiors for restaurants, offices, meeting rooms, bank lobbies, and the like.

No other manufacturer offers you such a broad range of quality wall coverings as Laminating Services. One unique material is Pliant Wood, shown below, a genuine wood veneer with fabric backing. Pliant Wood can be applied directly to existing walls, requires no furring strips, no alteration of existing woodwork. It's available in over 50 species in matched or random grade, including many exotic varieties.

There are many more: Vin-L-Fab, offering hundreds of colors, textures and patterns, such as Vin-L-Fab "22", a tough, solid vinyl that even comes in stripes in widths you specify . . . Wovan, for the soft beauty of woven cloth . . . and velvety Vin-L-Suede, of washable nylon.

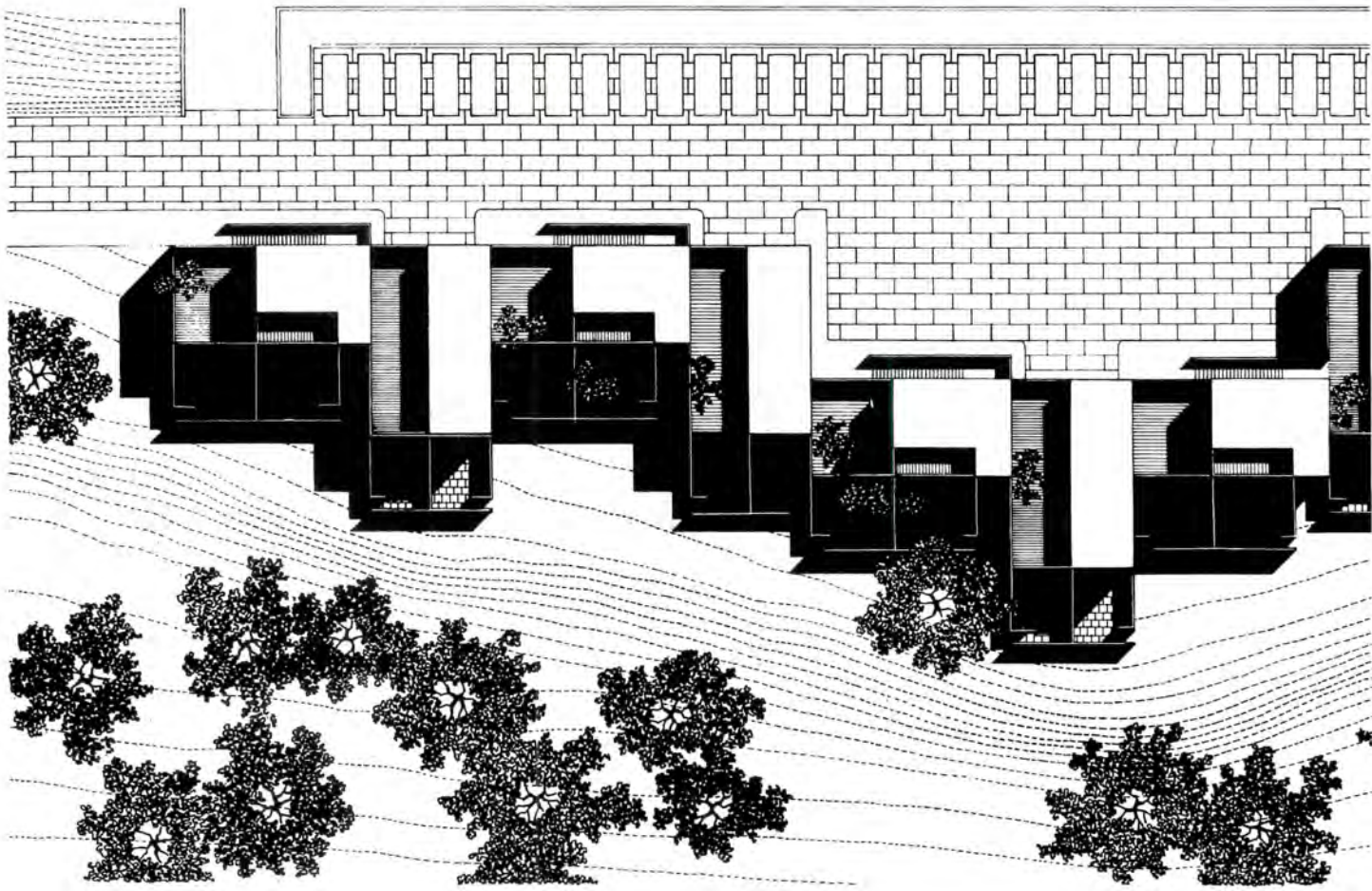
No other manufacturer can answer so many of your wall covering needs.

For details write for Brochure No. 100(A).

SEE US IN SWEET'S

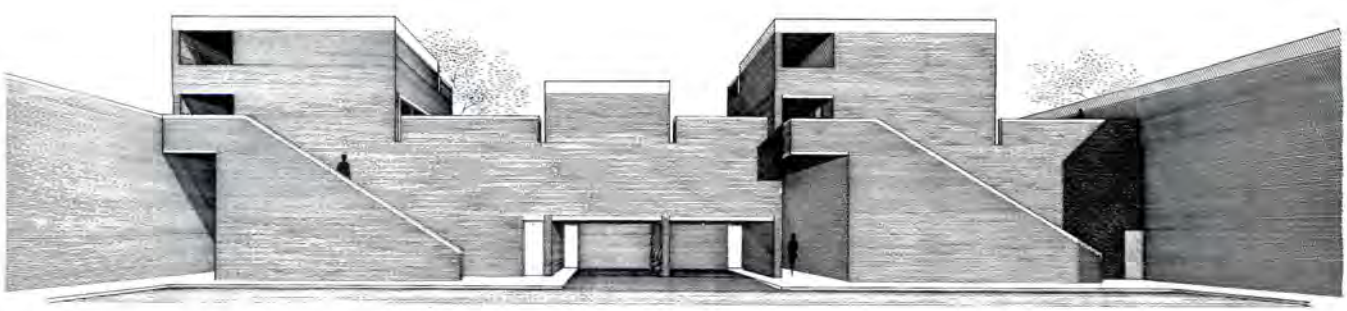
LAMINATING SERVICES, INC.
4700 Robards Lane, Louisville, Ky. 40218

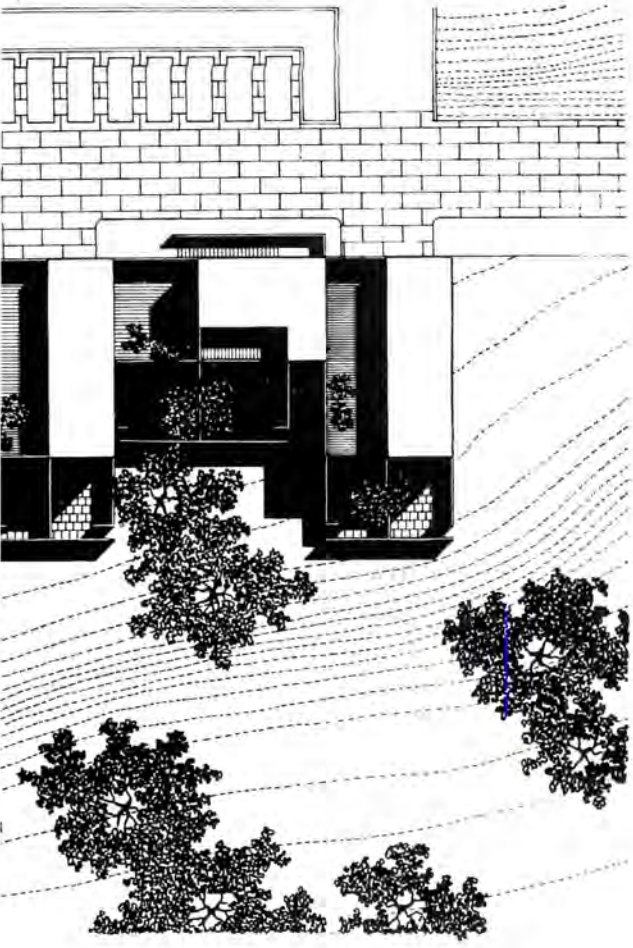
For more data, circle 89 on inquiry card



Marvin Hatami designs an apartment house

Utilizing Zonolite® Masonry Fill Insulation he cut operating costs $600 annually and handed his client a 206% return on his investment





Zonolite prototype building #11: a walk-up apartment complex.

Architect Marvin Hatami and consulting engineers Cator, Ruma & Associates, both of Denver, Colorado, were commissioned by Zonolite to design this spacious, 35 apartment complex.

One of the problems to be faced was engineering the structure to withstand Denver's severe winters, yet remain consistent with budget requirements.

To do this, Mr. Hatami specified Zonolite Masonry Fill Insulation. The addition of Masonry Fill increased net costs by $3400. However when this is figured against a 20 year mortgage life, at 6% interest, the annual cost becomes only $292.

Compared to the annual $600 reduction of operating costs, Zonolite provided a $308 a year saving for the client. That's a whopping 206% return on his investment.

The reason for this high return is the low cost, combined with the effectiveness of Zonolite Masonry Fill Insulation.

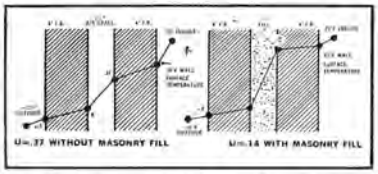
Masonry Fill also reduces initial building costs because smaller, more efficient heating units can be utilized. And because of the insulation's sound absorption qualities, each apartment is quieter.

Additional facts worth investigating are contained in our Bulletin MF-113. Write Zonolite, 135 South La Salle St., Chicago, Illinois 60603.

ZONOLITE

GRACE

ZONOLITE DIVISION W. R. GRACE & CO.
135 SO. LA SALLE ST., CHICAGO, ILL.



At 10° below zero, with the building heated at 70°, the interior surface of an outside wall without Zonolite would register an uncomfortable 50°.

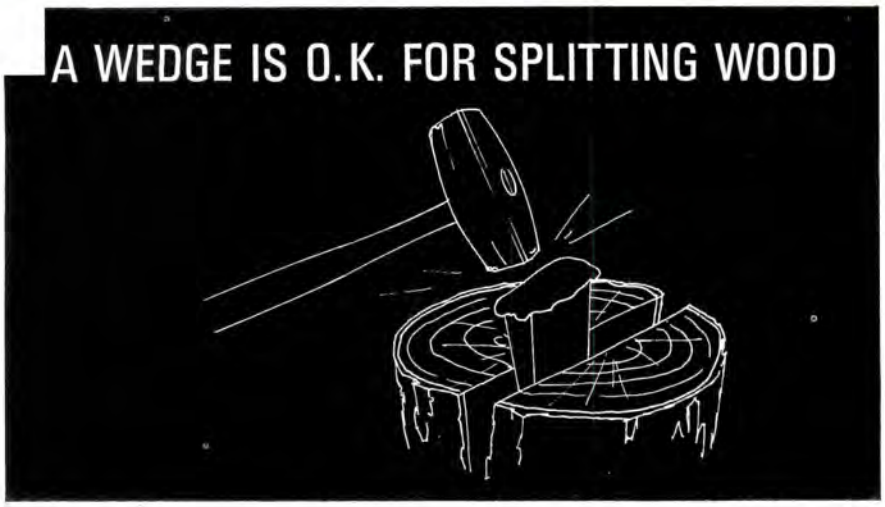
By installing Zonolite Masonry Fill Insulation, the architect was able to increase inside wall temperature to a comfortable 62°.

DESIGN CONDITIONS			Winter Heat Loss in BTU/HR. Assuming 70° F Indoor −10° F Outdoor	
	Without Masonry Fill	With Masonry Fill	Without Masonry Fill	With Masonry Fill
Walls	4" Face Brick 2½" Air Space 4" Face Brick	4" Face Brick 2½" Zonolite Fill 4" Face Brick	826,000	**313,000**
Roof	Roofing, 4" Concrete 2" Insulation		155,000	**155,000**
Floor	4" Concrete on Grade		41,000	**41,000**
Glass	¼" Plate Glass		780,000	**780,000**
Ventilation	4000 CFM		504,000	**504,000**
Totals			2,306,000	**1,793,000**
% Savings with Masonry Fill			$\frac{2,306,000 - 1,793,000}{2,306,000} \times 100 = 22\%$	

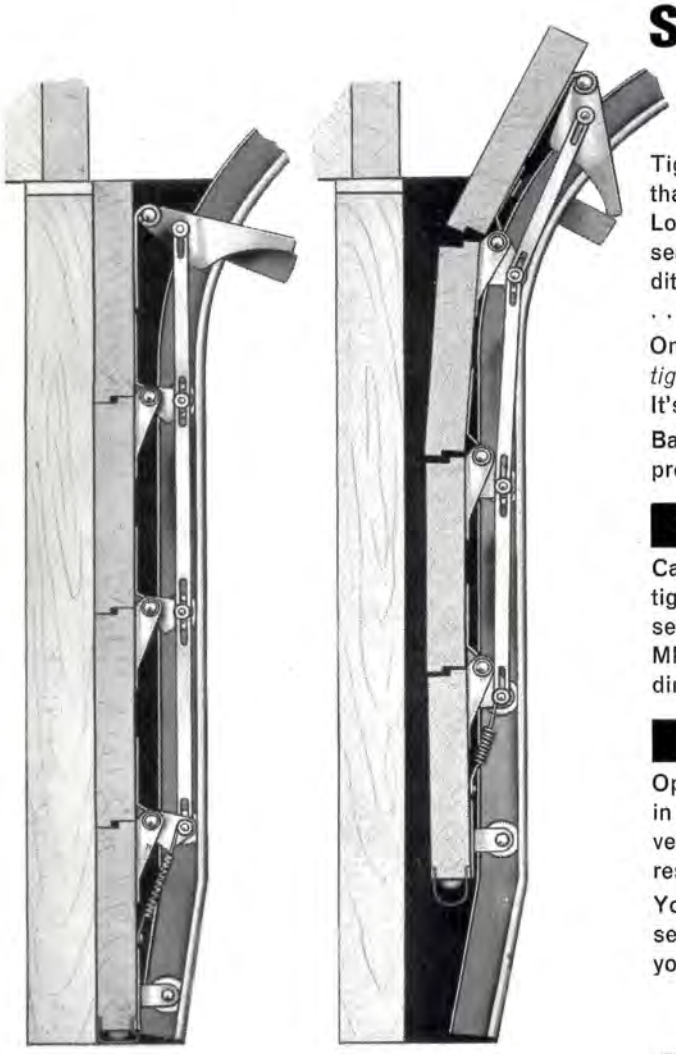
1. Operating costs are reduced by over $600 per year.
2. 34,000 sq. ft. of walls (includes 6,000 sq. ft. of Interior Walls) @ 10¢/ft.=$3,400 installed.
3. Raised indoor wall surface temperature from 50° F to 62° F provides added comfort.
4. Increased wall attenuation characteristics reduces sound transmission between apartments by a considerable amount.

Based on 5673 degree days $.053 per therm gas boiler.

For more data, circle 90 on inquiry card



Exclusive "CAM-ACTION" doors by BARCO



CLOSED
Cam-Action holds door tightly against jamb stops. Positive seal eliminates *air leakage*, keeps out dirt particles, wind and rain.

OPENING AND CLOSING
Cam-Action keeps door away from jamb to maintain 1/4" free-running clearance. No binding during door movement.

seal tighter . . . are friction free!

Tight-fitting doors help maintain accurate temperature control that's essential to modern manufacturing and storage operations. Loose-fitting, wedge-type doors are not expected to achieve tight sealing that's fully effective. They permit costly heated and conditioned air to leak out, dirt, soot and weather elements to leak in . . . increasing maintenance and overhead cost the year round.

On the other hand, conventional wedge doors adjusted to seal *tight* will stick, bind or won't budge . . . like a wedge in a stump. It's a problem!

Barcol doors with exclusive "Cam-Action" operating principle provide the answer.

CAM-ACTION HARDWARE

Cam-Action and Gasketed Perimeter Sealing make Barcol the tightest sealing doors on the market! Barcol Cam-Action doors seal 15 TIMES tighter than conventional wedge-type doors (10 MPH wind velocity) providing maximum sealing against dust, dirt, water, air-borne corrosives, abrasives and weather elements.

PERIMETER SEALING

Optional jamb-gasketed Cam-Action door seals 90 TIMES tighter in a 70 MPH wind than a conventional door in a 10 MPH wind velocity. Compressible neoprene rubber jamb gasket remains resilient to —60°F.

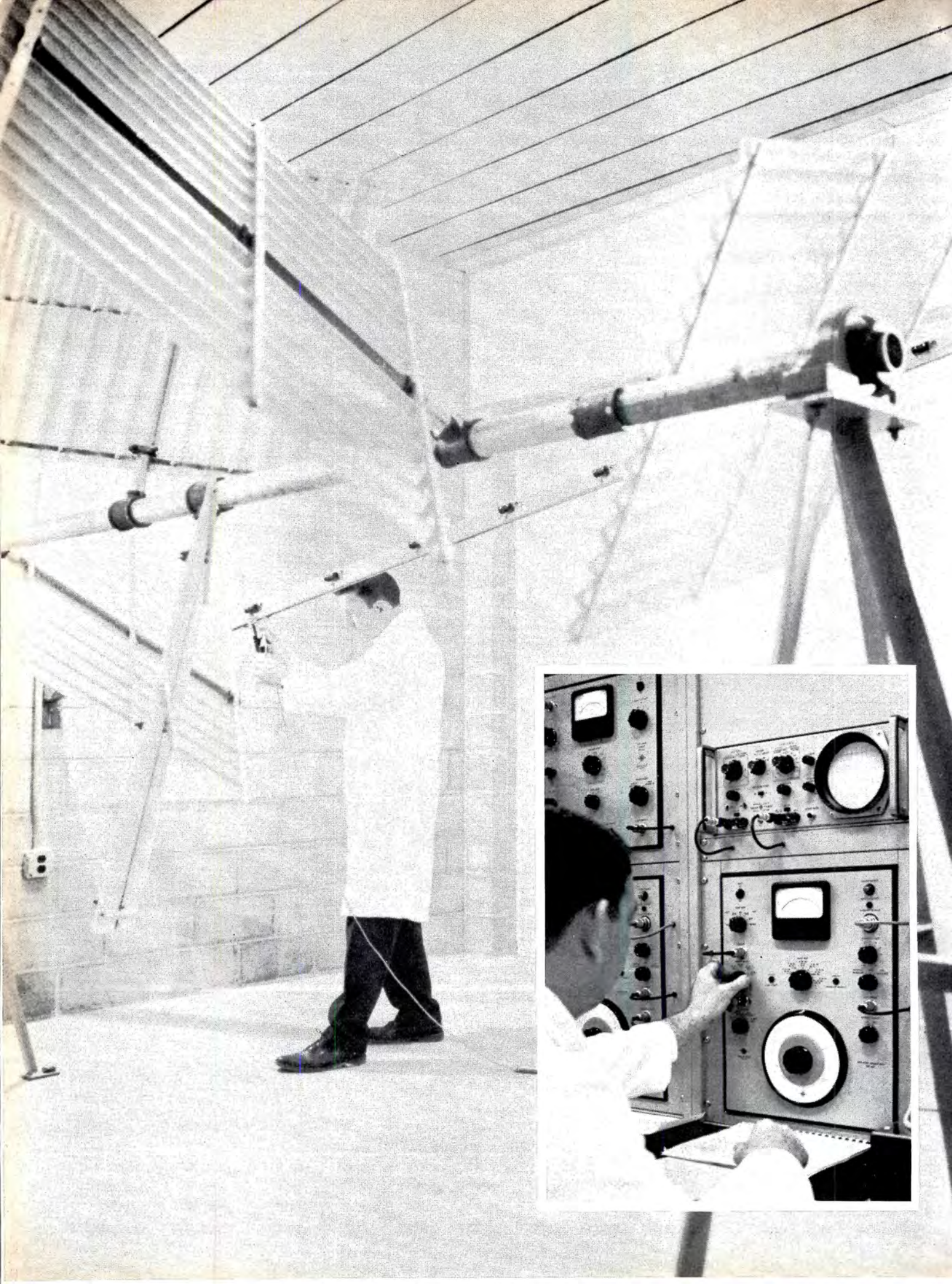
Your Barcol dealer is prepared and qualified to provide tight-sealing doors . . . and analyze other door problems that will help you prevent unnecessary plant-operating costs.

OUR CATALOG IS IN SWEET'S

BARCOL

BARCOL OVERDOOR COMPANY
SHEFFIELD, ILLINOIS
Subsidiary of Barber-Colman Co.

For more data, circle 91 on inquiry card



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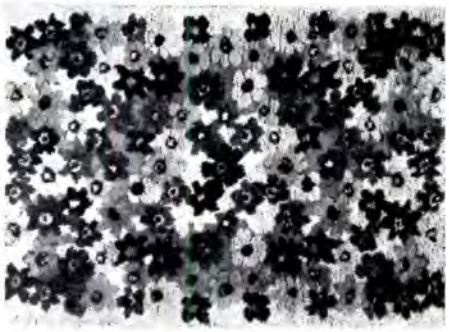


RUGS / A collection of 31 handsome area rugs, handmade in Portugal and Spain, offers new ideas in color, design, and texture. In addition to the original 31, many variations are possible: for example, the center motif of one may be combined with the border of another, and the rugs are available in any size and coloring. Shown here are the "Zodiac" and "Cedovim" models. The latter is a three-level shag with mottled background and multicolored flowers. ▪ Simon Manges & Son, Inc., New York.

Circle 307 on inquiry card

OFFICE FURNITURE / The 3000 Series is a grouping of double and single pedestal desks for the executive and general office use, secretarial units, machine units and groupings of credenzas and tables in various sizes. The desks come with wood or wood-pattern tops, custom colors or 14 decorator colors. ▪ Yawman-Erbe Division, Sterling Precision Corp., New York City.

Circle 308 on inquiry card

more products on page 208

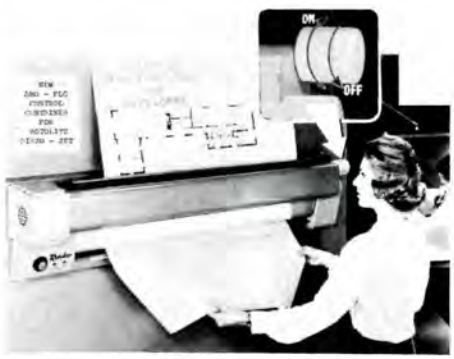
continued from page 205

DRAFTING MACHINE / This drafter, imported from Mutoh Industry Ltd. of Japan, has a two-year unconditional guarantee. Features include: ability to be raised clear of the board to a vertical rest position; stainless steel tension bands; supersensitive, adjustable disc brakes for full stability on board inclines up to 25 deg; five-minute vernier with removable magnifying lens; adjuster for hairline baseline settings; and engine divided acrylic plastic scales. All internal parts are fully machined to exacting tolerances. ▪ Drew & Carr, Inc., Chicago.

Circle 309 on inquiry card

RETRACTABLE SLIDE RULE / A pocket-sized slide rule extends to ten in. The rule has A, B, C, and D scales with the B and C scales folded in D^2 pi and D pi relationship to permit determination of circular areas and circumference by moving cursor only. Reverse side measures 20″ or its metric equivalent and lists basic equivalents, fan laws, power, trig and geometric formulae. ▪ Cal-Tape, Roann, Ind.

Circle 310 on inquiry card



DEVELOPER-PRINTER / A combination developer and printer with an ammonia system added to the developer section promises "fast, convenient processing of architectural drawings, plans and specifications, layouts, charts and maps." The ammonia control container needs no venting and there are no plastic or rubber tubes. ▪ Rotolite Sales Corporation, Stirling, N.J.

Circle 311 on inquiry card

more products on page 230

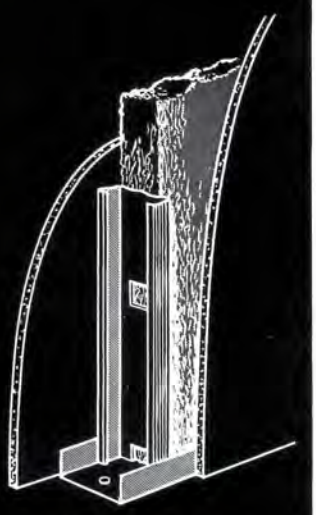
For more data, circle 95 on inquiry card

You get sound advice from Gold Bond

Like walls that assure privacy. Four Gold Bond partitions, from the many we've developed, are shown here — and each has a Sound Transmission Class of 47 or better. ■ These systems use Gold Bond Gypsum Wallboard in a variety of ways. For example, take our method of using ½" wallboard over 1" interlocking core boards (below, right). The STC of this system is 57 — and it's fire-rated for two hours. ■ Gold Bond Wallboard Systems are thoroughly tested and proven. (We have the finest privately owned research facilities in the industry in our new Sound and Fire Testing Center.) At the Center, original research and construction systems testing are conducted in accordance with A.S.T.M. Standards. Various sound chambers measure all characteristics of absorption, transmission, flanking and impact noise. Chambers are sufficiently large in size and volume to permit testing of full-scale partition and ceiling construction systems. ■ It's all part of our program to improve sound and fire control systems. So whenever you want to provide acoustical privacy or fire protection, talk to your Gold Bond® Representative. ■ He'll give you sound advice. ■ Or write National Gypsum Company, Department AR-116G, Buffalo, New York 14225.

Gold Bond®
PARTITION SYSTEMS

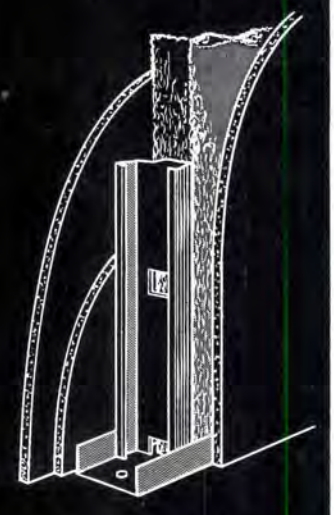
STC 47



SINGLE LAYER PARTITION

One layer of Gold Bond ½" Fire-Shield Wallboard is fastened to each side of 3⅝" steel screw studs spaced 24" o.c., with 1" drywall screws 12" o.c. Space between studs is filled with 3" Fiberglas® Insulation, friction fit in stud cavity. Sound transmission class: 47. (Riverbank TL 66-142)

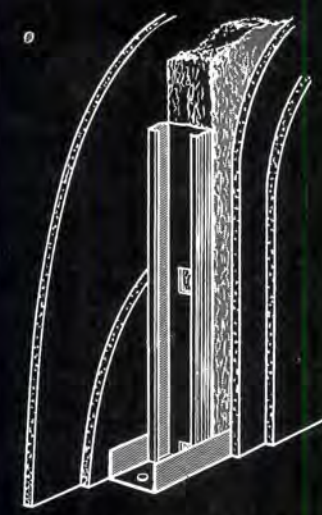
STC 53



UNBALANCED PARTITION

A single layer of ⅝" Fire-Shield Wallboard is fastened to one side of 3⅝" steel screw studs with 1" drywall screws 12" o.c. On the other side, two layers of the same board are applied: the first layer with 1" screws 12" o.c. at edges and 24" o.c. at intermediate studs, the second layer with 1⅝" screws 12" o.c. Mineral wool insulation, 2" thick and 3# density, friction fit in stud cavity. STC is 53. (Geiger & Hamme, NG 243 Ft.)

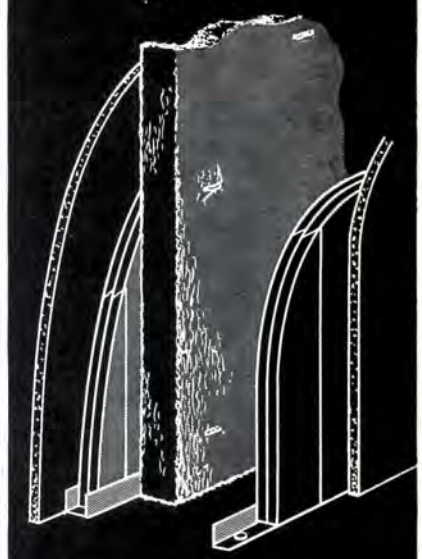
STC 53



DOUBLE LAYER PARTITION

Both sides are identical, using double layers of ½" Fire-Shield Wallboard. Base layers are fastened to 2½" steel screw studs spaced 24" o.c., with 1" drywall screws 12" o.c. at joints and perimeter and at third points at intermediate studs. Face layers fastened with 1⅝" drywall screws 12" o.c. at joints and 16" o.c. at intermediate points. 3" Fiberglas® insulation friction fit in stud cavities. STC is 53. (Riverbank TL 66-65)

STC 57



DOUBLE SOLID PARTITION

Two 1" interlocking gypsum cores are spaced 4" apart, with insulation (3" thick, 2 pcf Fiberglas® or 3" thick standard R-11 Fiberglas® or 2" thick mineral wool) stapled to the back of one core in the cavity. Over the cores, Gold Bond ½" wallboard is laminated to each side. STC is 57. (Geiger and Hamme, NG 218 Ft and NG 222 Ft and NGC Testing Lab.) Angles, shown at right, were used in sound tests. Channels are optional.

For more data, circle 93 on inquiry card

New facts on Gas vs. Electric Heat

Eight Pennsylvania schools are bid both ways.

Holiday Park

The comparative figures at the right tell the story of the actual alternate bids. First costs of Gas and electric heating are virtually the same. And the operating economy of Gas heat made it the choice in 7 out of the 8 new Pennsylvania schools.

This study is not an isolated case. Far from it. The Better Heating-Cooling Council has data on 32 pairs of bids from four other states. Figures show Gas first costs actually averaging 2.4% *lower* than electric resistance heating.

Interested in school heating costs? Now you have a double reason to consider Gas. Its economy has been proven, initially and over the long term. Your local Gas Company Sales Engineer can tell you the full story. See him soon.

AMERICAN GAS ASSOCIATION, INC.

For school heating... Gas makes the big difference

Result:

no basic difference in first costs. Gas heat is chosen for operating economy.

West Point

Fairless

Perry

South Franklin

South Jr.

Blaine-Buffalo

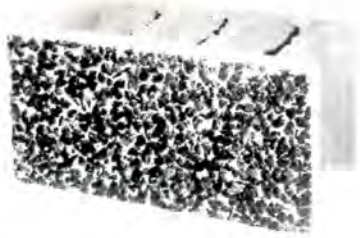
Findley

TOTAL CONSTRUCTION BIDS

Location, Name of School	Square Feet	Gas	Electric (Resistance)	Date of Bid	System Installed
Monroeville (South Jr.)	104,000	$1,580,700	$1,636,300	July '60	Gas
Claysville (Findley)	14,000	205,633	204,173	July '59	Gas
Claysville (Blaine-Buffalo)	14,000	216,459	217,725	July '59	Gas
Claysville (South Franklin)	4,600*	96,952	95,938	July '59	Electric
Mount Morris (Perry)	18,000	267,285	270,132	Jan. '61	Gas
Westmoreland Co. (West Point)	39,071	729,620	715,666	Apr. '63	Gas
North Braddock (Fairless)	17,000	345,279	348,679	Apr. '61	Gas
Plum Boro (Holiday Park)	35,000	530,790	522,970	Dec. '61	Gas

*Addition

continued from page 208

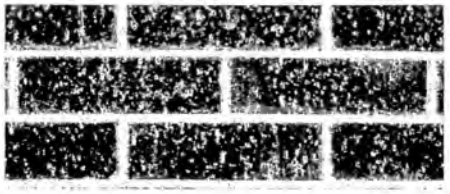


CONCRETE BLOCK / A precision cast concrete block, similar in size and structure to the standard concrete block, has an exposed aggregate face manufactured directly on the block. The surface may be any one or a combination of the fifteen aggregates. The manufacturer says that the stones retain their full color and brilliance permanently, requiring no maintenance. ▪ Preco Chemical Corp., Plainview, N.Y.

Circle 312 on inquiry card

LONG LENGTH GLUED REDWOOD / "Finger-Joint" end-glued redwood lumber can be ordered to the exact length, width, thickness and grade called for by the job. Tested exterior adhesives are used at the glue-line which accepts paint as well as the surrounding redwood. ▪ Union Lumber Company, San Francisco.

Circle 313 on inquiry card



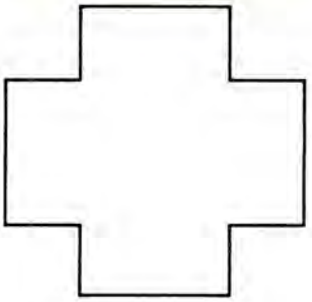
CERAMIC GLAZED TEXTURED BRICK / The manufacturer reports that the finish of this brick is a maintenance-free facing, impervious to moisture and soil. In addition to bronze tones, there are blue-green and brown-green blends. ▪ The Claycraft Company, Columbus, Ohio.

Circle 314 on inquiry card

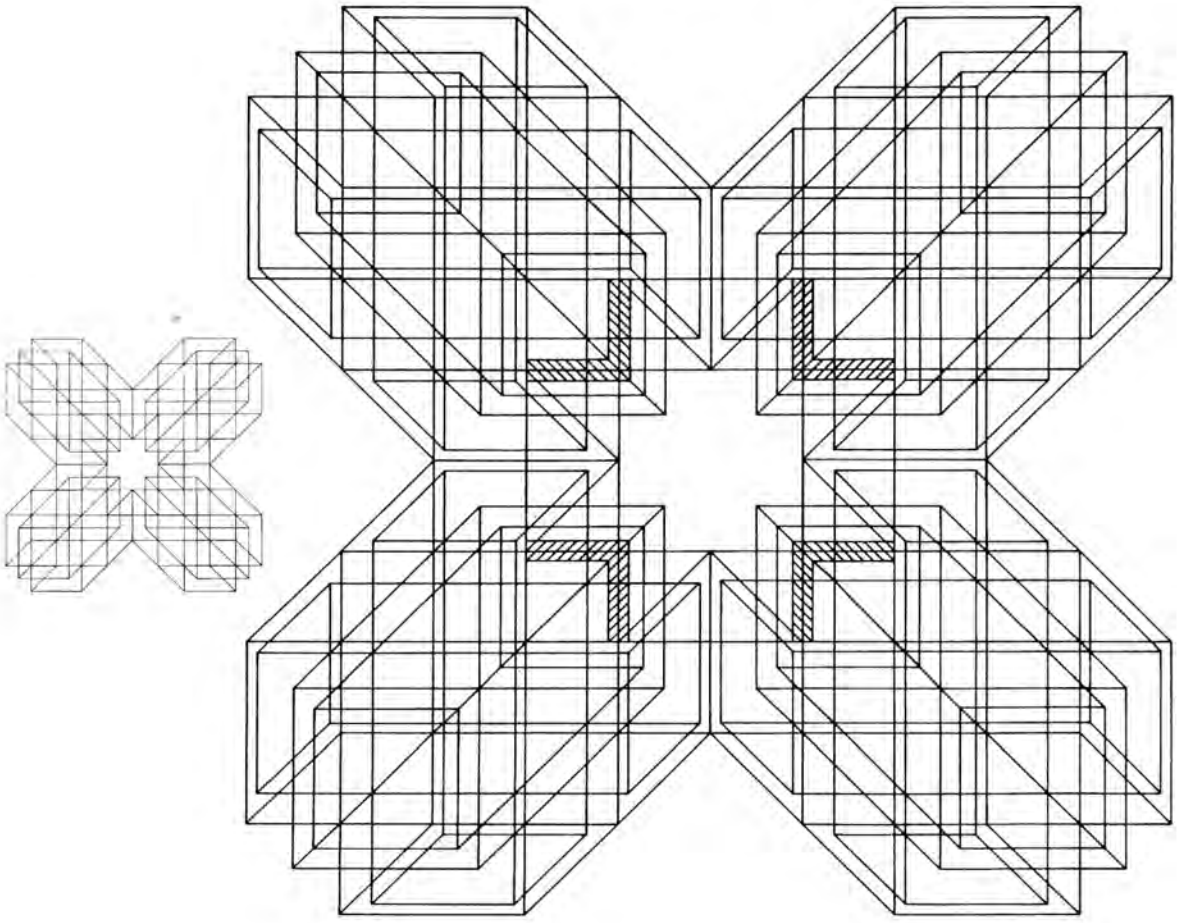
more products on page 238

The formal generators of masonry structure:

The cruciform



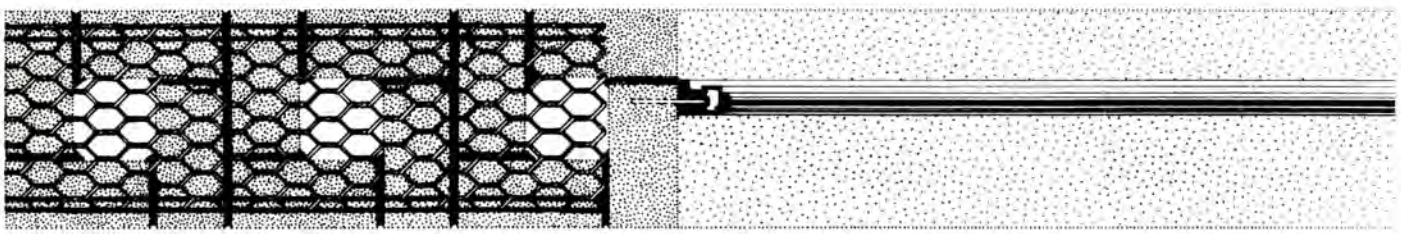
no. 4 of 6



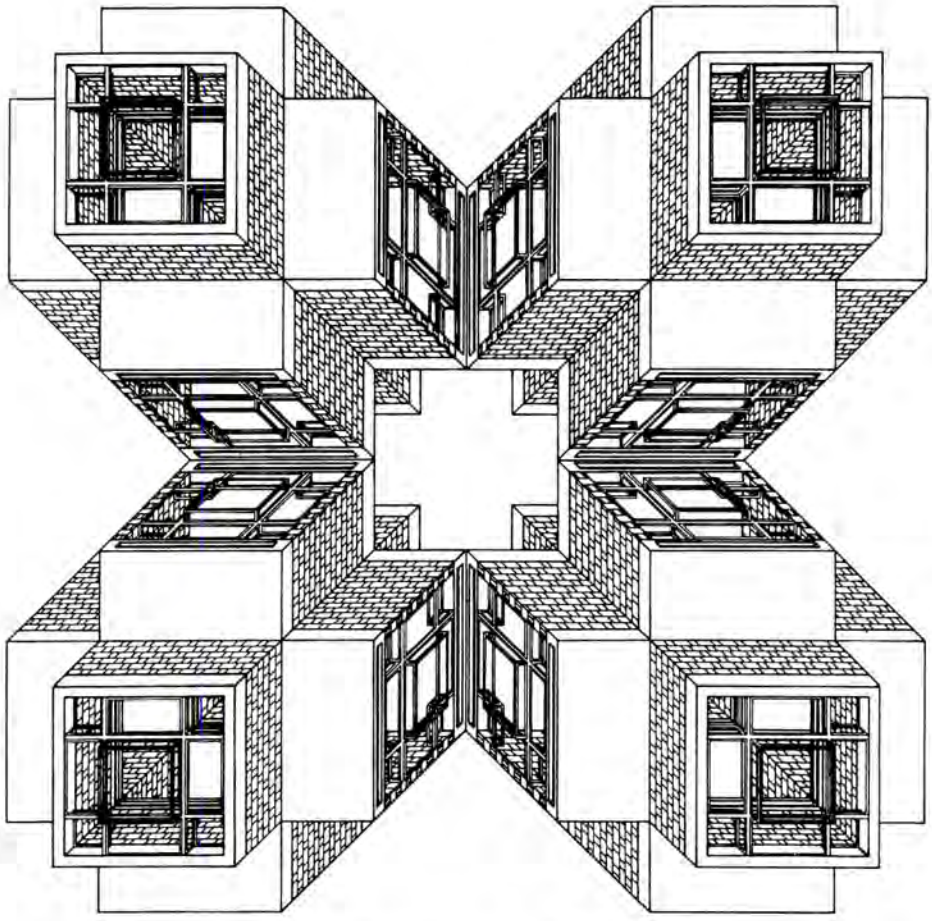
Architect Stanley Tigerman continues his exploration of masonry structures with the cruciform. Projected three dimensionally, it then proceeds from parti to floor plan to complete structure.

Throughout this series, we shall continue to show how the basic orthogonal shapes of masonry construction—the square, lozenge, rectangle, pinwheel, cross and linked figure—can be developed and projected. We hope the drawings offered here will not only be of interest to you, but also prove helpful by serving as both idea stimulators and time-savers.

Our motives, however, are more concerned with products.



Jamb sections: 12" brick masonry wall, Flemish bond with operative steel sash.



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We have two products, roll-type and rod-type Keywall® masonry reinforcement, which can help you improve the usage and quality of masonry construction. We want you to use them, so we make it easy by including them in the details shown below.

This structure—with the details drawn to 3″=1′0″ for easy tracing—are reproduced on convenient 8½″ x 11″ sheets. To receive these and the entire series, write:

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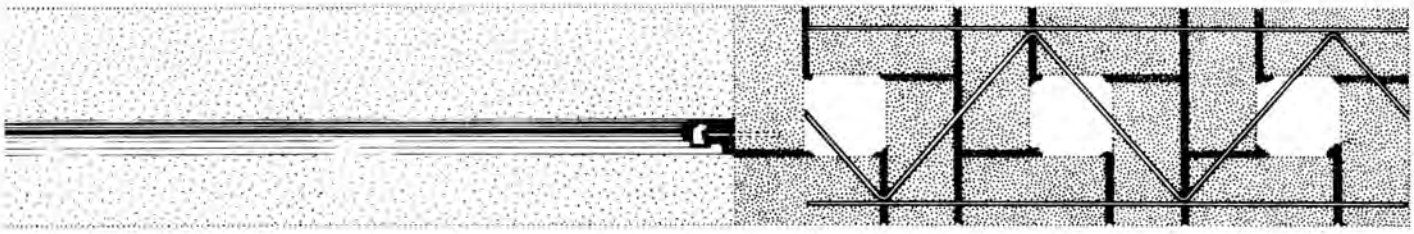


For more data, circle 111 on inquiry card

The $10,000 typewriter.

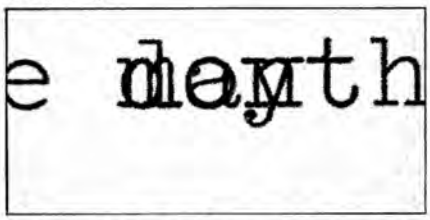
It's a better bargain than a 20¢ eraser.

The new IBM Magnetic Tape Selectric® Typewriter, (MT/ST for short), costs ten thousand dollars.

And it's worth every penny.

Before, when a typist made a mistake, she had to stop typing and erase it. Or maybe even start all over again.

But with the new IBM® MT/ST, she simply backspaces, retypes, and keeps on going.



The mistake is changed on magnetic tape, where all typing is recorded and played back correctly at incredible speed. (Roughly 15 characters per second.)

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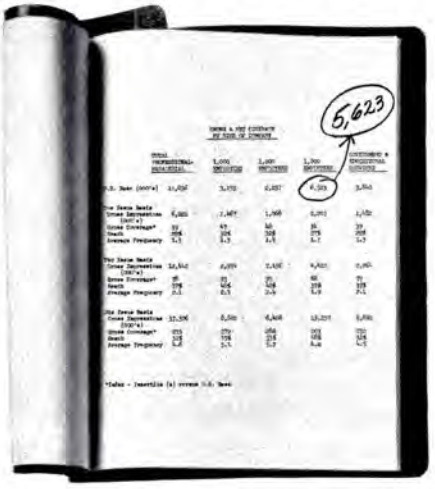

Only your changes are retyped. The rest is automatic.

Now for the $10,000 question: What does the new IBM MT/ST mean to you?

For one thing, a girl who types 80 words per minute won't end up averaging a slow 20 wpm because of constant retyping or restarting.

For another, the IBM MT/ST shortens the time gap between your first draft and the finished document.

In fact, you'll be able to handle correspondence, contracts, proposals, and building estimates more than 50 percent faster. (With less proofreading, too.)

The new IBM MT/ST: more power and more productivity. Ask your IBM Representative for the complete story.

Remember, you have to stop typing to use a twenty-cent eraser.

And that's the rub.

IBM

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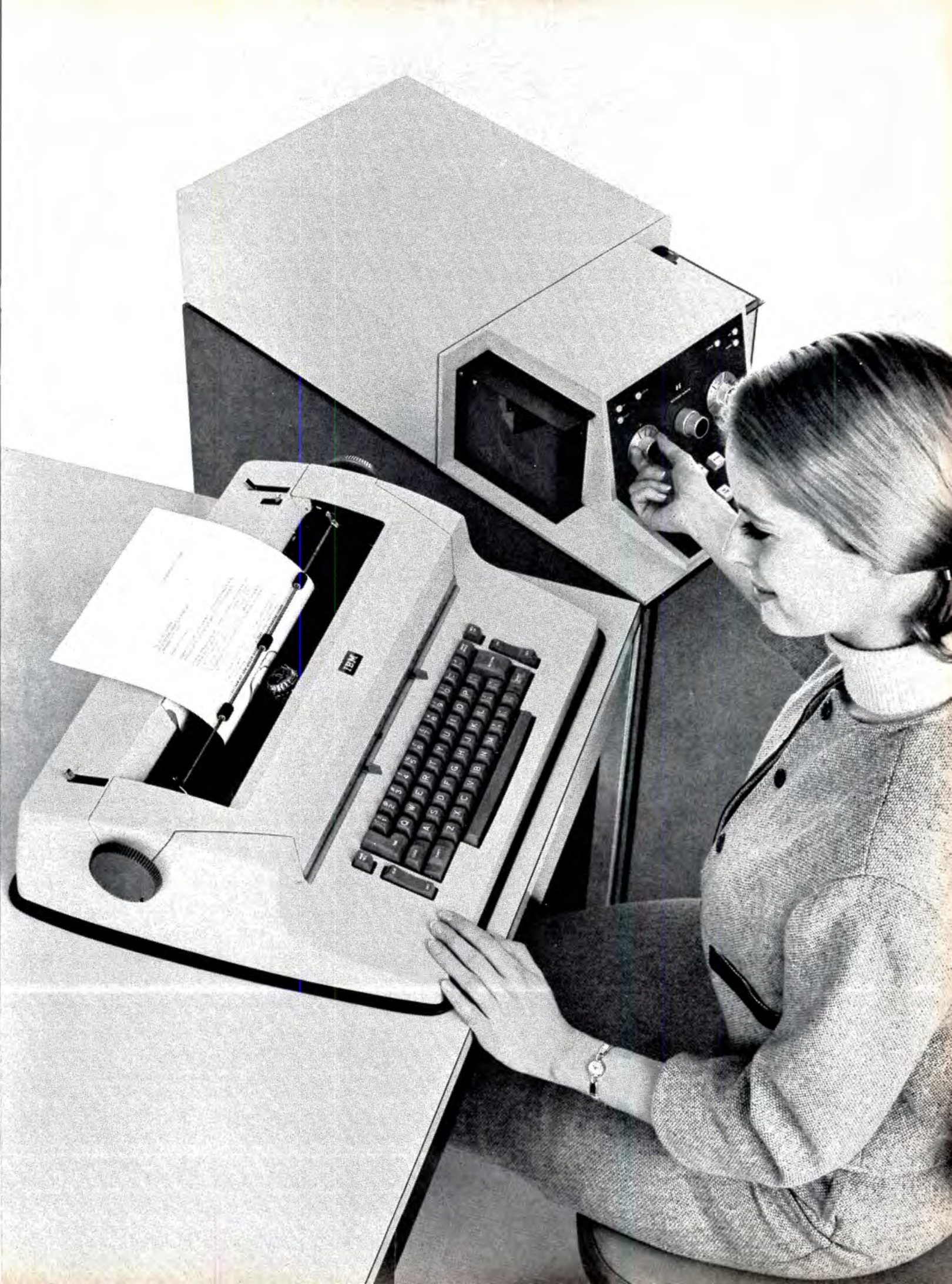
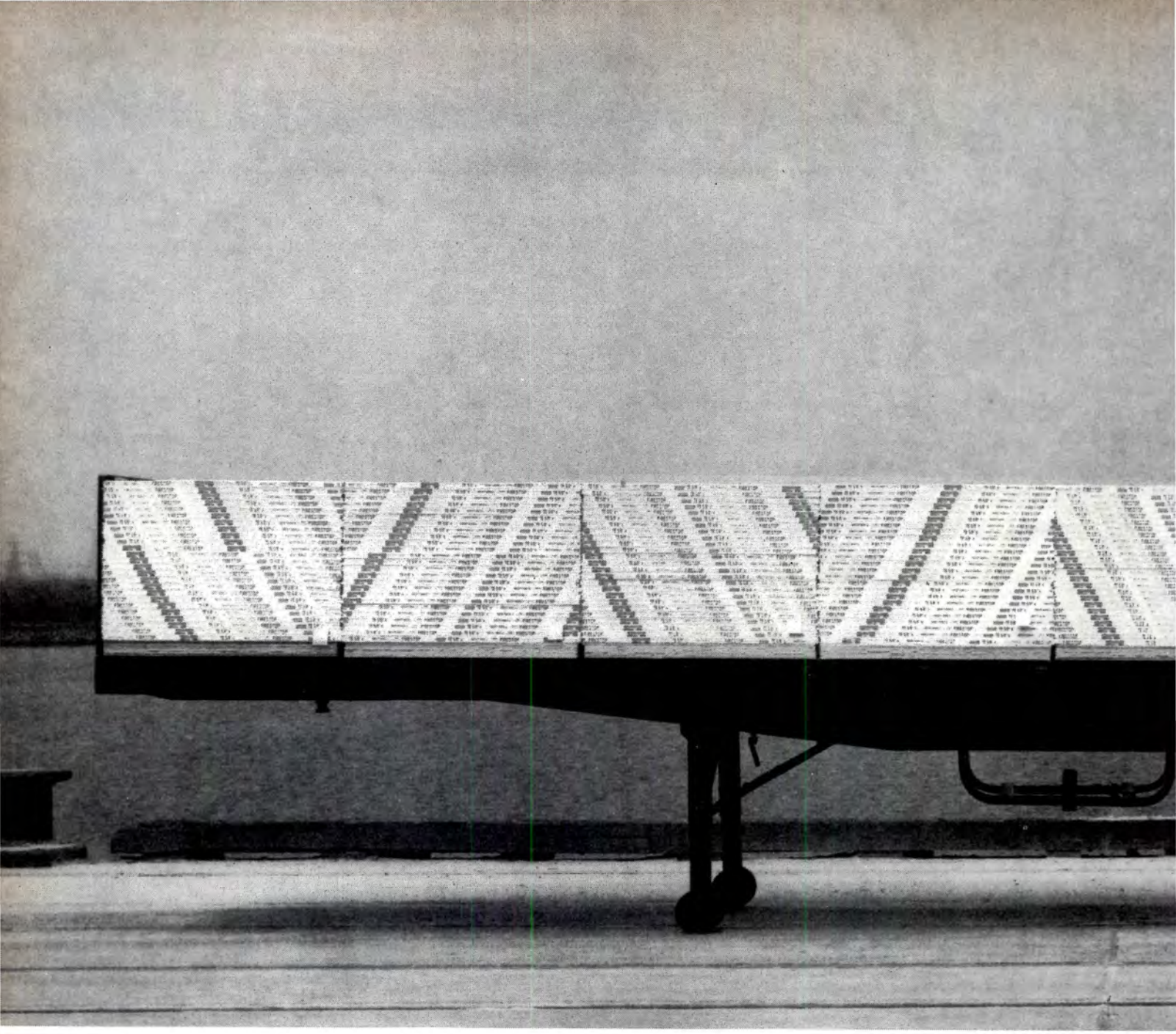
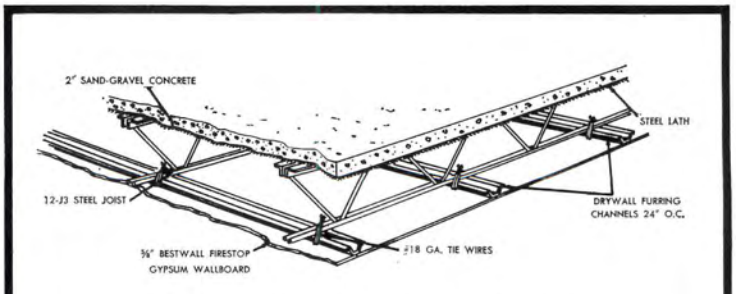
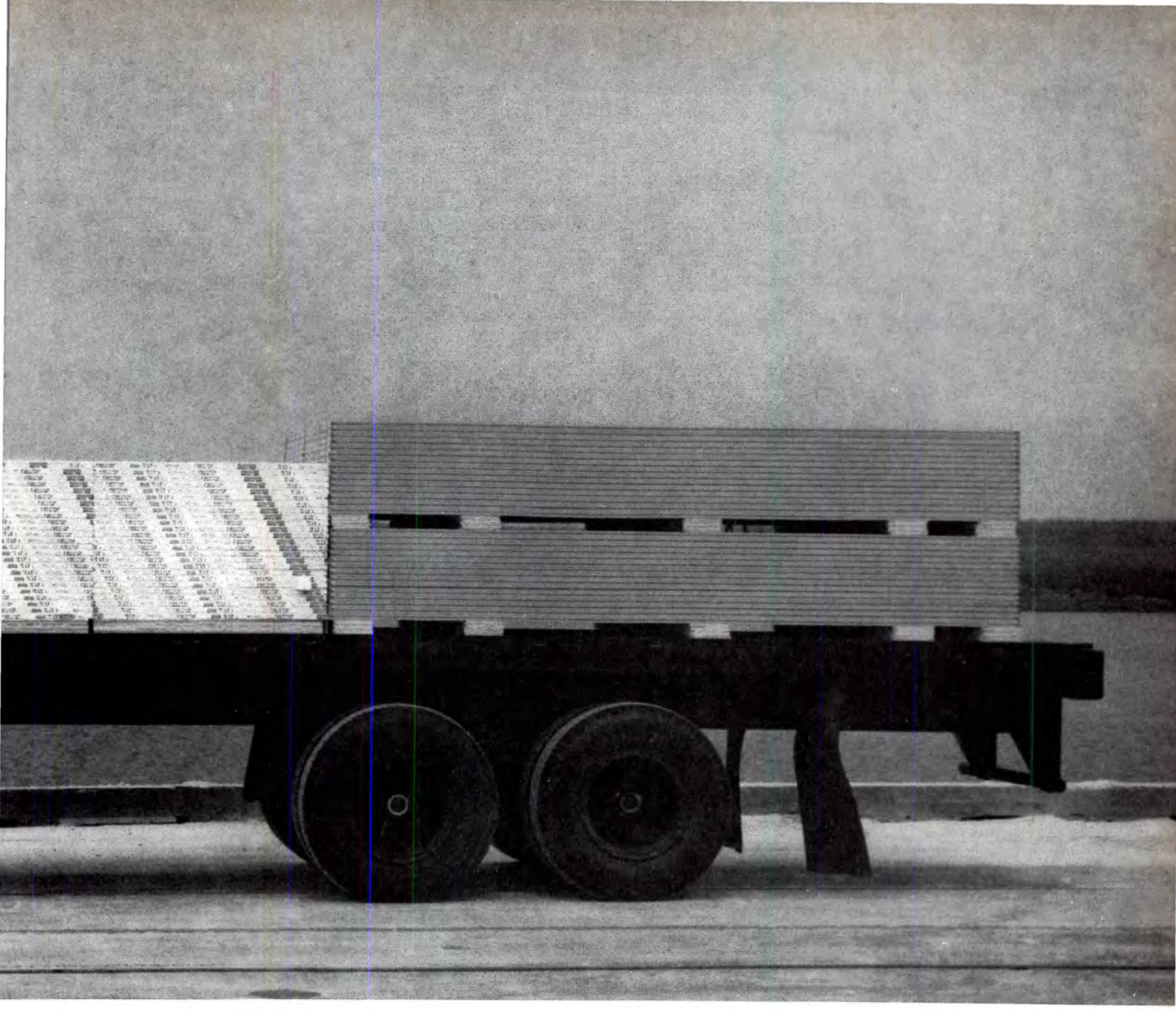




New 5/8" Firestop provid s



UL Design 259—2 Hr. (with 2" concrete)



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continued from page 230

HOSPITAL LAV-STATION / This one-piece unit can be installed in present or planned patient rooms as well as in examining, treatment, or recovery rooms. Built-in features include overhead light, mirrored door, towel dispenser, removable shelves, convenience outlet, hot and cold water faucets equipped with wrist blades, soap dispenser and one-piece sink and backsplash. Unit may be recessed into the wall or wall mounted. ▪ Market Forge Company, Everett, Mass.

Circle 315 on inquiry card

FLOORING / Novalite, a development of formulated powders, marble chips, and resin, may be installed as thin as ⅜ in. and provides a white matrix as well as pastel colors. ▪ Selby, Battersby & Co., Philadelphia.

Circle 316 on inquiry card

HANDLING SYSTEM FOR HOSPITALS / This automatic system consists of a monorail, a self-propelled electric transporter, and removable closed containers. The system allows rapid continuous travel in both horizontal and vertical directions, without limit on distance or number of stations. Any type of material can be carried, up to the 220-pound capacity of each container. ▪ Ritter Pfaudler Corporation, Rochester, N.Y.

Circle 317 on inquiry card

more products on page 246

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An integral safety specification for large buildings, siamese connections allow use of a building's water source as a supplement to fire department hydrants

You can specify W. D. Allen siamese for sidewalk or wall, flush or projecting installations, rough or polished brass or chrome, 2-way, 3-way, 4-way

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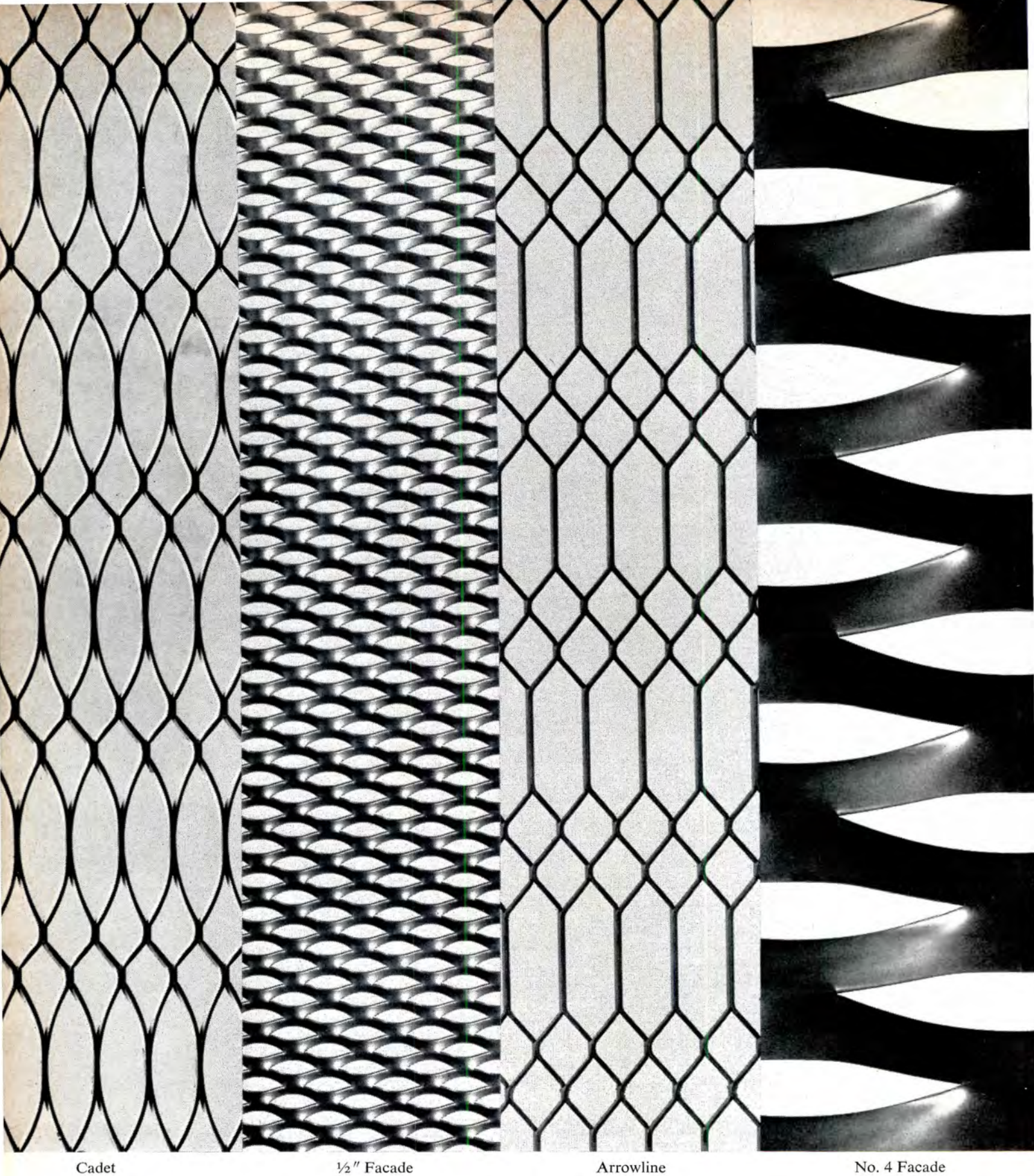

Cadet ½″ Facade Arrowline No. 4 Facade

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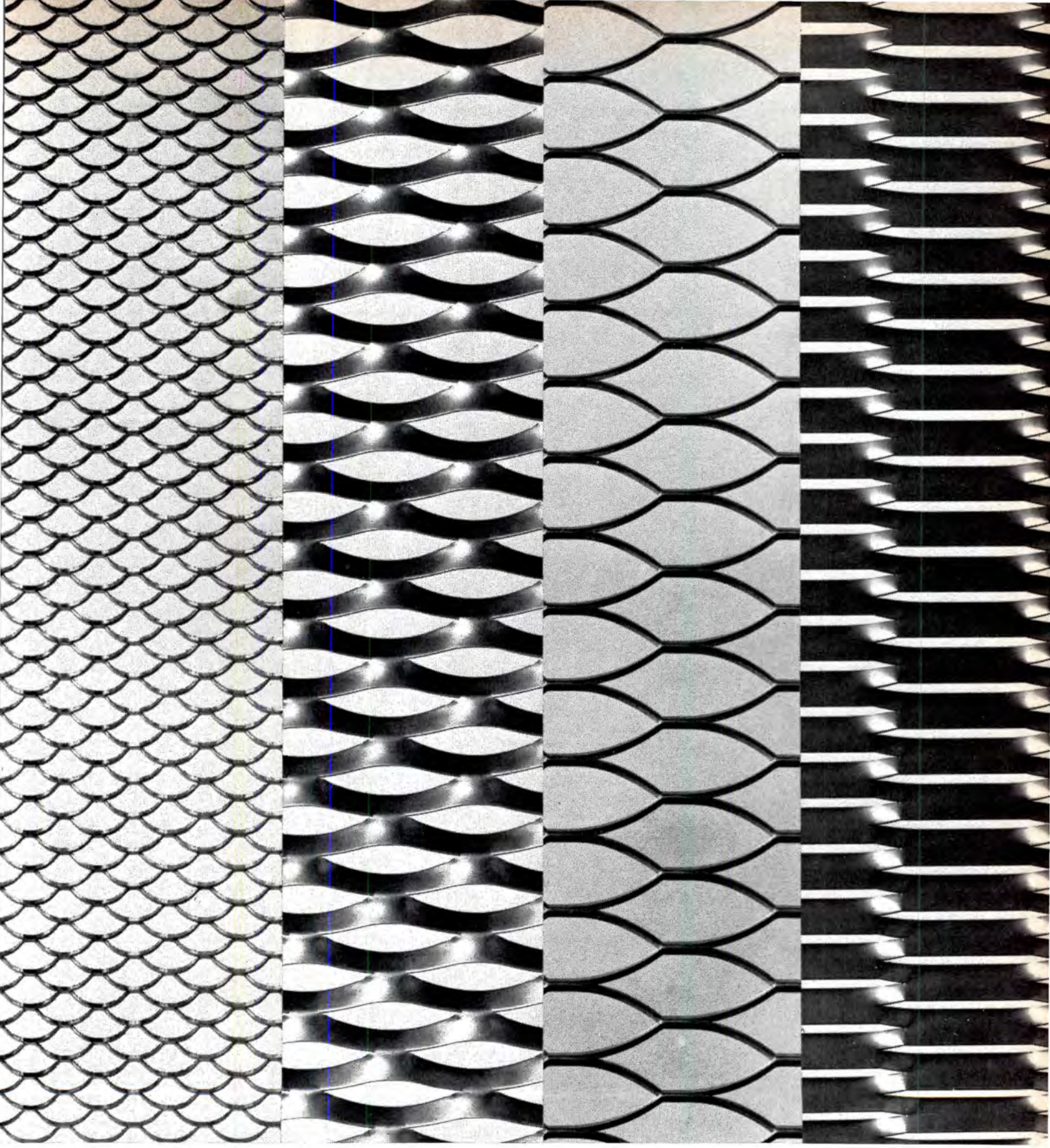

Drape Mesh | 1½″ Facade | Castle | Louvermesh

it's made from. Wrap it around a balcony; slap it up on a wall; divide a room with it; shape a patio; contemporize a

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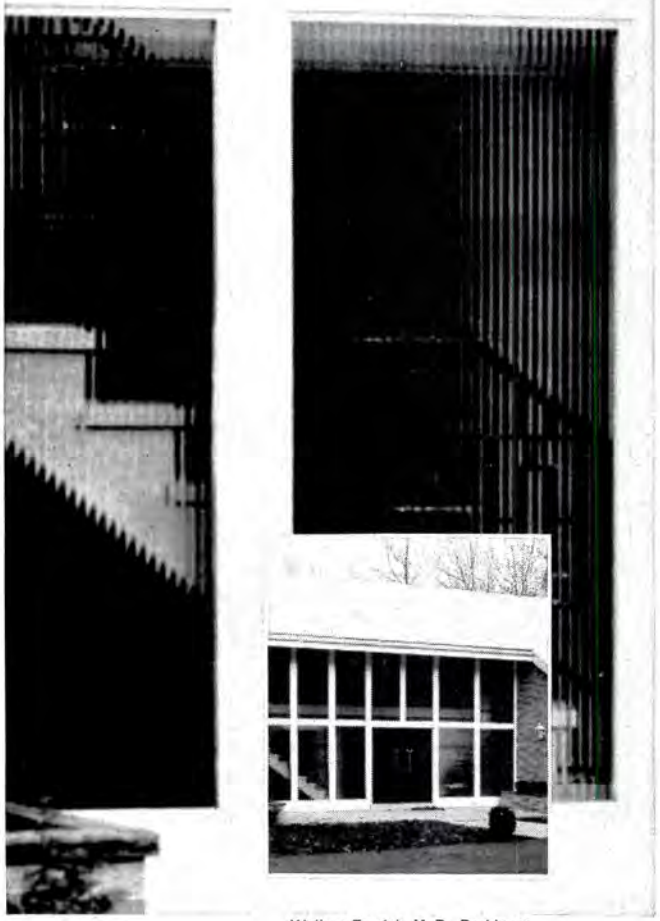

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For First Stage of
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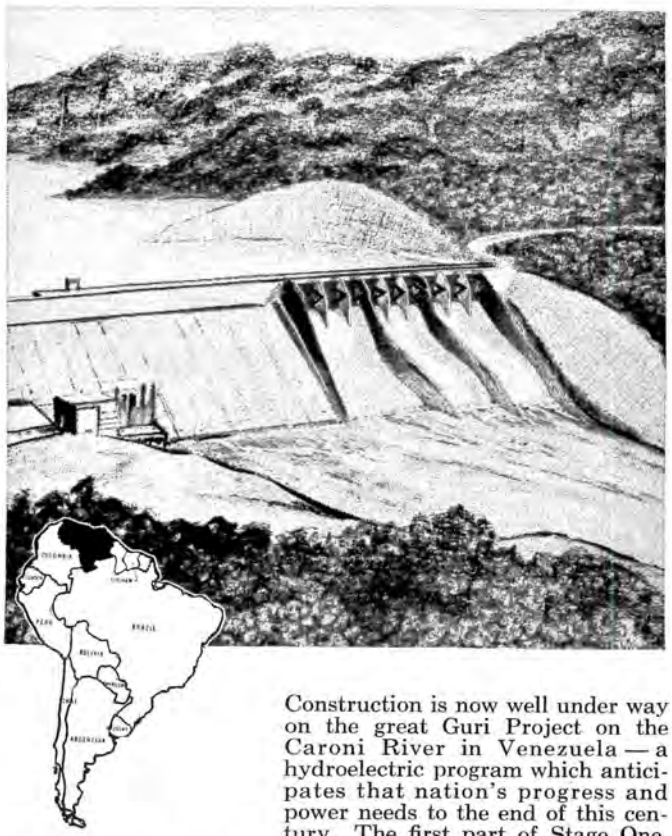

General Contractor — Consorcio de Guri: Kaiser Engineers and Constructors, Inc.; Macco International; Tecon International; Merritt, Chapman and Scott, Inc.; and Christiani and Nielsen Corp.

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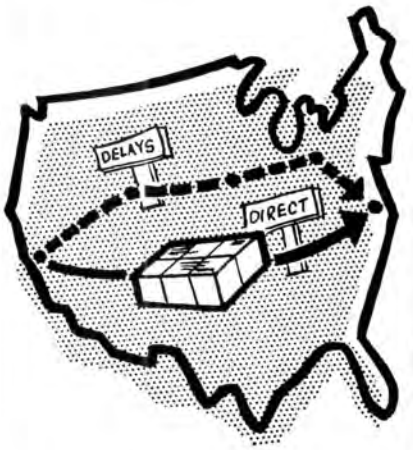

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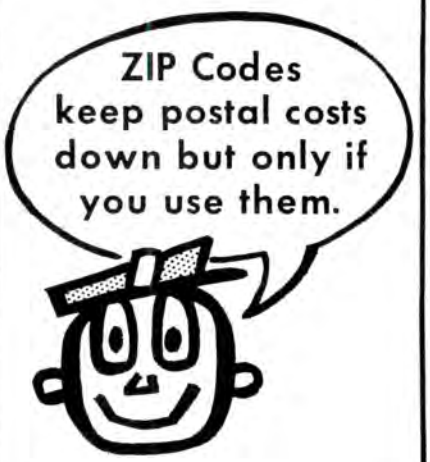

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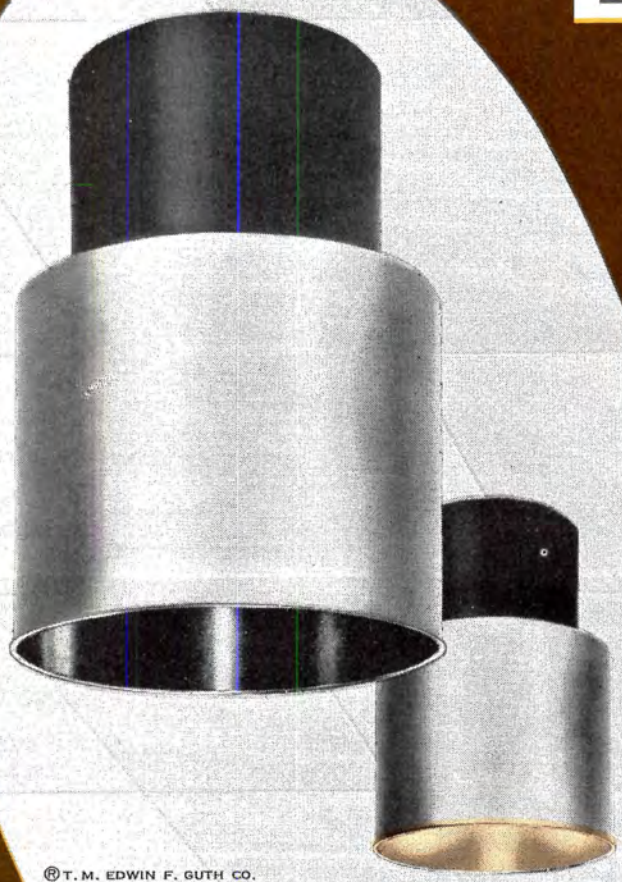

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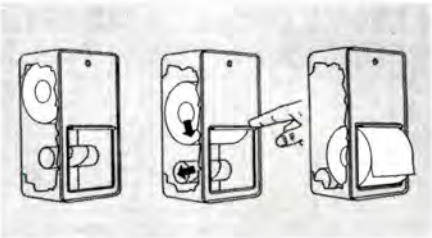
continued from page 238



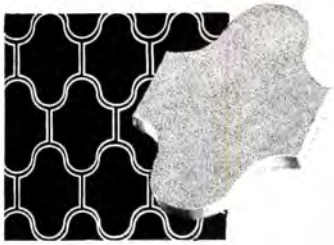
BATHROOM DISPENSERS / The "Fash'n-Front" of this dispenser allows an almost unlimited selection of materials to harmonize with the room interior. Push button automatic features hold and dispense two rolls of tissue. Only after the first roll is used will the push button allow the second roll to lock into place. ▪ Reserv-A-Roll Company, Houston, Texas.

Circle 318 on inquiry card

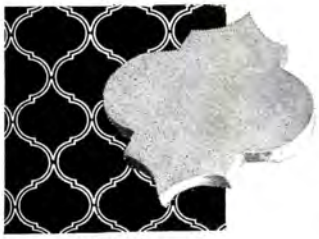
MOP SERVICE BASIN / This lightweight basin of man-made stone provides flexibility in installation and accurate fitting in pre-planned space. The manufacturer reports that the surface is smooth, stain-proof, non-porous and easy to keep clean. ▪ Fiat Products Department, American Cyanamid Co., Plainview, L.I., N.Y.

Circle 319 on inquiry card

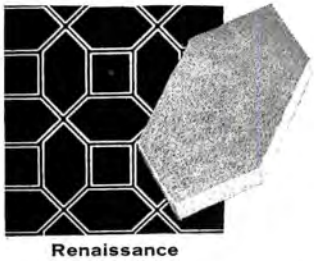
more products on page 254



Provence



Valencia



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The chairs are Krueger's 3205-U UPHOLSTERED ARM CHAIRS welcoming you with open arms to all the comforts of foam. Shell is contour-molded and upholstered in select colors of deep-textured fabric or Naugahyde. Covers are neatly fitted and sealed to contours for the look of executive elegance coming and going. Choose from brushed aluminum swivel/pedestal bases with self-leveling glides (casters optional), black enamel or chrome-plated tubular steel legs. See the handsome 3200 Series Upholstered Arm Chairs live and in color at your nearest Krueger dealer.

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For more data, circle 159 on inquiry card

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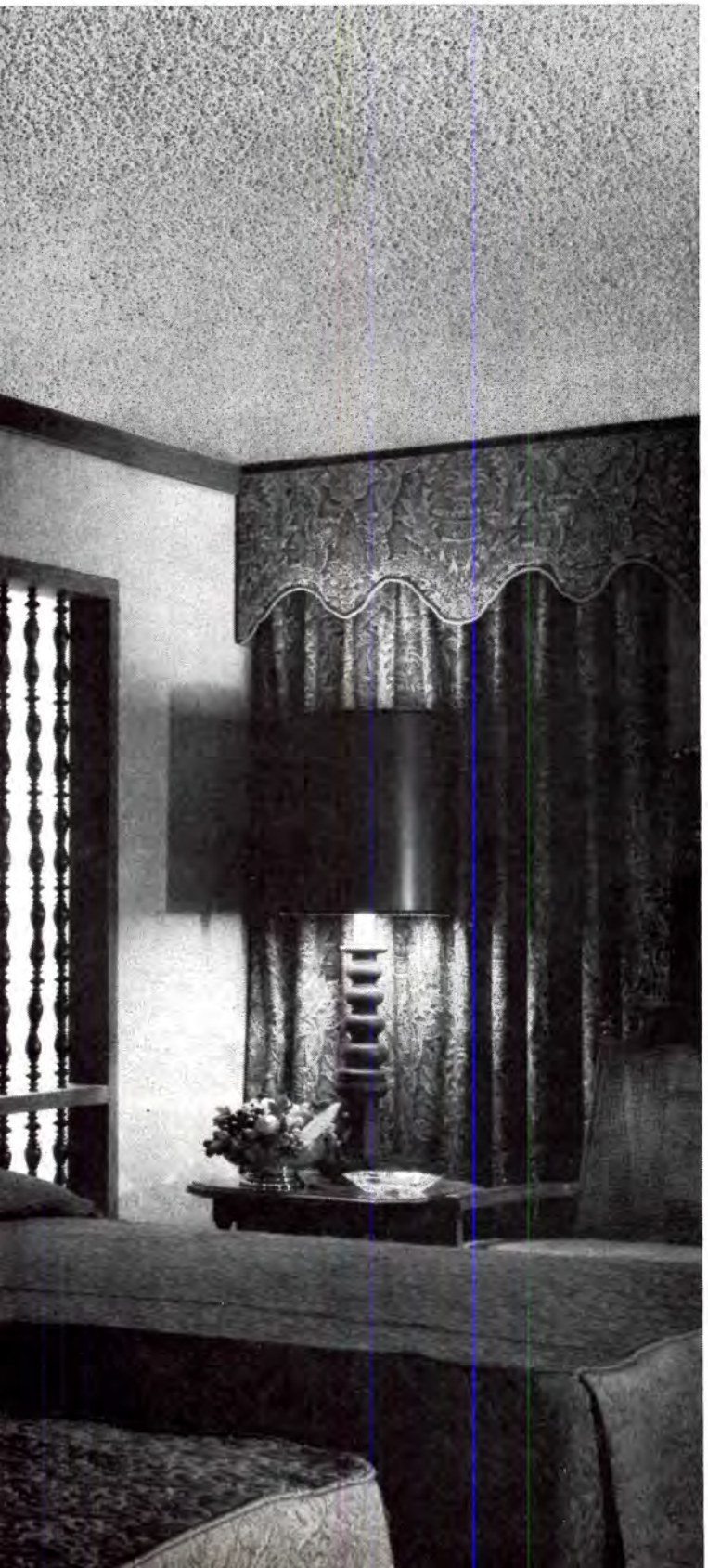
BREAKTHR

BY UNITED

OUGH!

STATES GYPSUM



ACOUSTONE Acoustical Tile in new GLACIER pattern presents a deep-fissured surface for ceilings that is unique in its ruggedness, unique in its natural beauty. No problem of monotony in appearance because no two tile textures are exactly alike. No break in the one-surface look because the fissures minimize all joint lines. GLACIER provides a noise reduction coefficient of .80. It is adaptable to all standard installation systems for acoustical ceilings and meets building code requirements as an incombustible product. GLACIER is the latest advance in ACOUSTONE Ceiling Tile...a name that is synonymous with high-quality sound control in construction.

GLACIER ACOUSTONE* Mineral Acoustical Tile...
another breakthrough by

UNITED STATES GYPSUM

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*Reg. U. S. Pat. Off.

how modular systems can work for you when you must design for interior flexibility

The systems approach to building planning lets you design for change. Starting with large, column-free areas, you can plan interior spaces that may be quickly rearranged, changing size, shape and environment without sacrificing quality.

Based on a horizontal planning module of 5x5 feet, the Inland Modular Structure and Ceiling Systems integrate with each other and with available mechanical and movable partition systems.

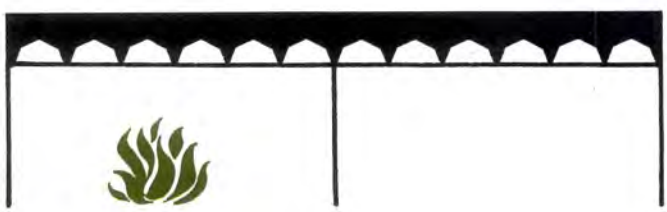
Bid winner of California's SCSD school project and successfully used in office and engineering buildings, as well as schools, Inland Modular Systems may suggest solutions in one of your upcoming projects.

We'd like to tell you more about these systems. Write us for a copy of our new Planning Manual, just off the press. Inland Steel Products Company, Dept. K, 4033 W. Burnham St., Milwaukee, Wisconsin 53201.

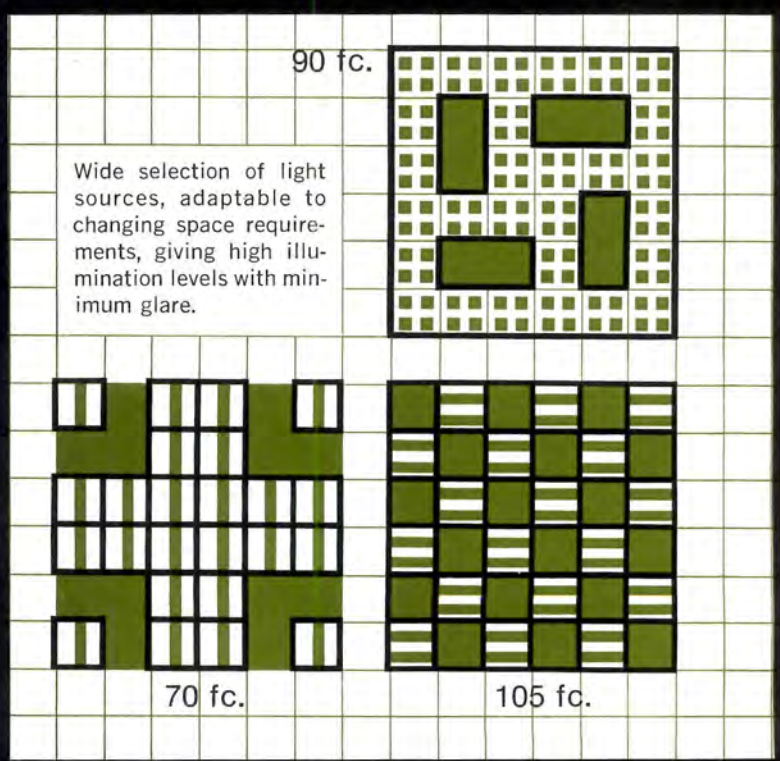
For more data, circle 124 on inquiry carc

One and two story buildings, with intermediate level changes.

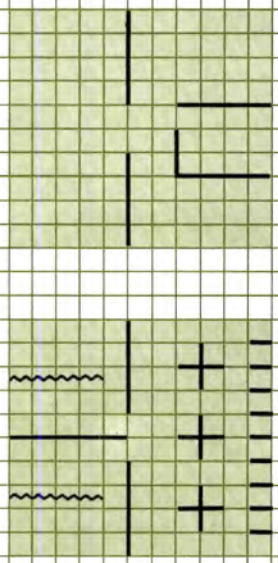
One-hour fire rating capability.



one hour



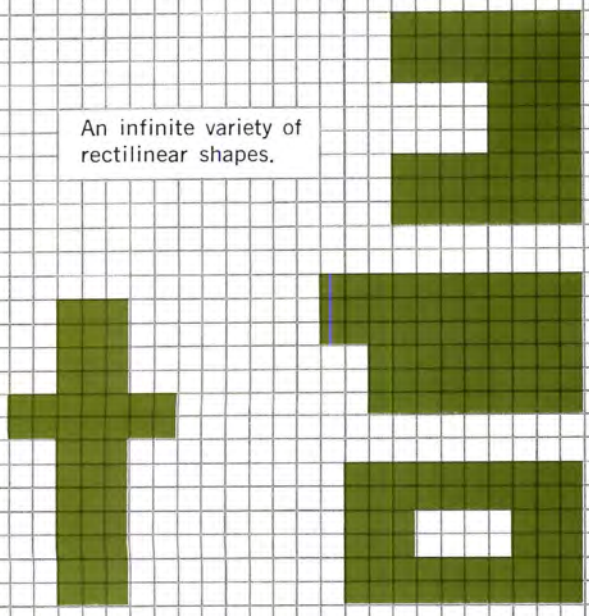
Wide-span capability for large open areas with smaller spaces created by use of compatible movable partitions, located as desired.



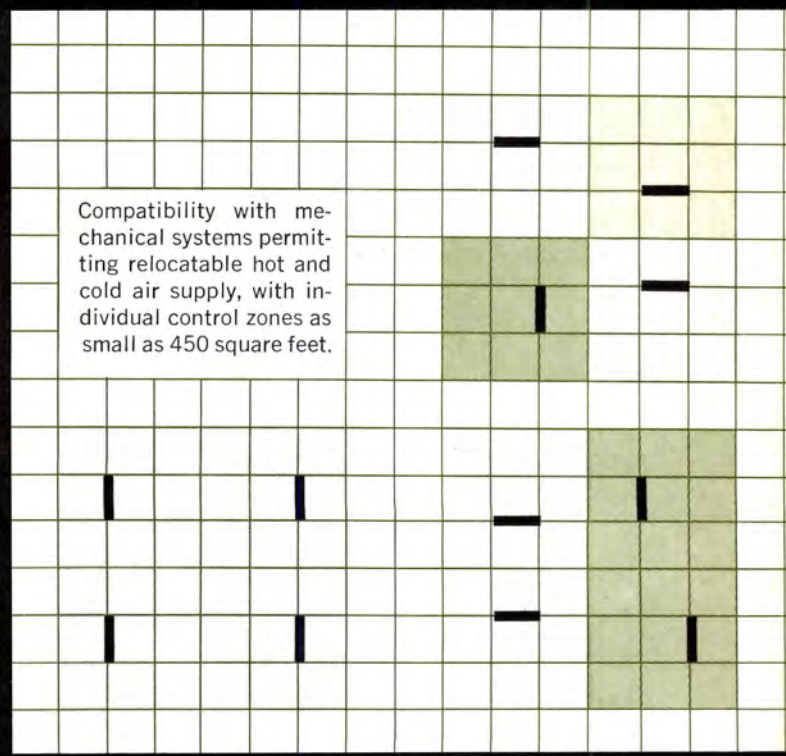
Excellent room-to-room sound attenuation with average noise reduction factor of 32 decibels.

32 dbs.

An infinite variety of rectilinear shapes.



Compatibility with mechanical systems permitting relocatable hot and cold air supply, with individual control zones as small as 450 square feet.



INLAND

Inland Modular Systems

REMINDER

Except for genuine hardship cases, volume mailers must pre-sort by Zip Code on or before January 1, 1967

The Zip Code deadline is January 1, 1967.

After that, only mail that is properly Zip-coded will be eligible for Second Class and Third Class Bulk rates. Unzipped mail will be accepted *only at the higher single piece rate.*

If you have not Zipped yet, you had better start right now!

Plenty of help is available. Both the U.S. Post Office and many private companies in the "mail sector" have already helped thousands of companies to Zip their lists quickly and efficiently. To help speed up your Zip conversion:

1. Call your local Postmaster. He will advise you on ways and means of converting to Zip, and show you how the Post Office can supply the Zip numbers you need for a nominal fee of only $1.50 per thousand.
2. Talk to your lettershop, addressing equipment salesmen, computer firms and other mail-oriented suppliers. They have developed many ingenious methods for Zipping lists at minimum cost to you.

Zip Code is here to stay!

Most businessmen clearly recognize that only through the modern Zip Code system can the Post Office hope to offer low bulk rates. But many are also learning to their surprise that Zip Code offers additional benefits to them.

During Zip conversion it is easy to clean your list of duplicate and dead addresses. Zip filing order makes "look-ups" quicker and easier. Zip Codes are already speeding mail deliveries, and a number of businesses find that Zip territorial divisions are useful tools in marketing, sales and other unexpected areas.

IMPORTANT

Extensions will be given to mailers who can demonstrate that they have made a substantial effort in good faith to comply with the deadline but are unable to do so because of circumstances beyond their control. To apply for a hardship extension, contact your local Postmaster at once. Do not wait until the last minute.

Remember: Zip Code means better postal service at lowest cost to you. There are and will be problems for all of us to solve. But we can be sure of one fact: January 1 starts a whole new era of postal efficiency and economy that will benefit your government, your customers and your business.

continued from page 246

MOVABLE COMPONENT CLASSROOMS / This system includes demountable "Double-Wall" and sliding "Operable Wall," making full use of the walls themselves as teaching tools. The layout can be changed to meet the changing needs of the school and the gliding wall permits varying classroom spaces from auditorium size to small- seminar-room size in minutes. ▪ E. F. Hauserman Company, Cleveland, Ohio.

Circle 320 on inquiry card

PANELING / Muralwood Paneling is said to be so authentically reproduced that it is "virtually impossible to distinguish from real wood." This paneling, which comes in six wood colortones, costs half as much as hardwood paneling. ▪ Weyerhaeuser Company, Tacoma, Wash.

Circle 321 on inquiry card

MOVABLE WALLS / A system that can be installed in schools, restaurants, offices and other heavy traffic public areas provides an acoustically-sealed flat wall that can be readily moved by custodial help to suit changing requirements. Mechanically expanded rubber shoes press against the floor and ceiling to close the opening. No floor track is required. ▪ Marlite Paneling, Dover, Ohio.

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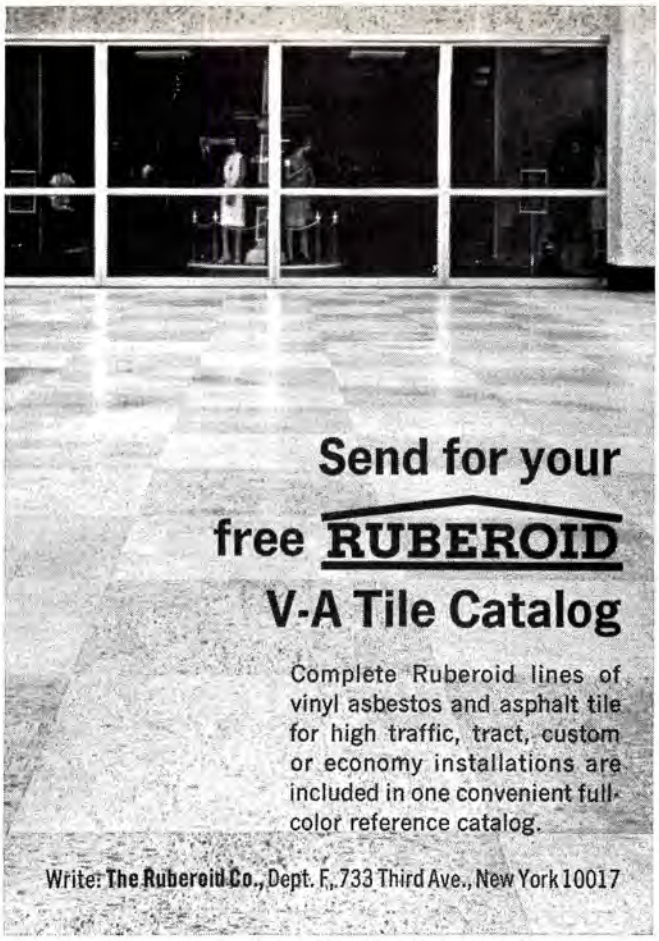
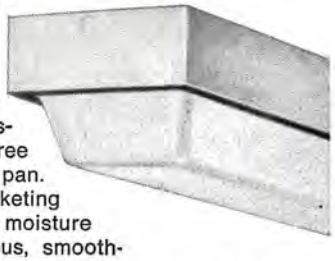
For more data, circle 127 on inquiry card



For more data, circle 163 on inquiry card

The best food processing fixtures made come from Wheeler.



Wheeler Clean Lite II is the ideal fixture wherever food is processed or served. In 4′ and 8′ lengths with 1 or 2 power groove lamps. *Only fixture of its type that uses 1500 MA lamps and can be surface mounted.* Unique can latch suspension for positive, stress-free support of straight, modern pan. Non-porous, closed cell gasketing surrounds housing . . . provides moisture and dust resistance. Continuous, smooth-welded seams. Clean, shadow-free bottom shielding. Available in clear or white acrylic plastic. For information write E. Quintilliani, General Sales Manager, Wheeler Reflector Co., Inc., Hanson, Mass.

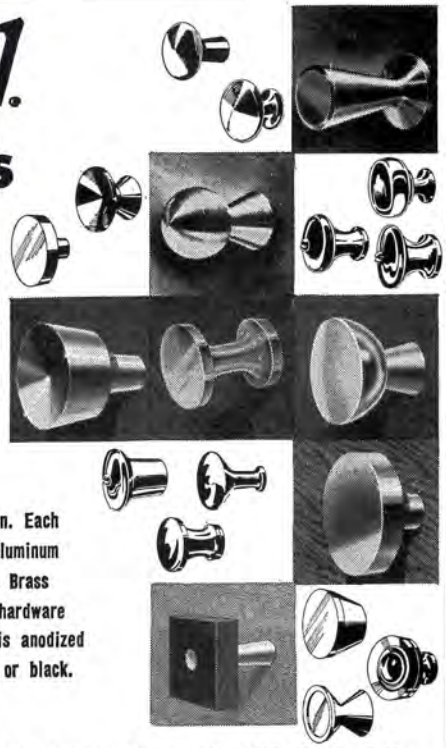
Designed by Paul Lamson Illuminating Engineer

For more data, circle 126 on inquiry card

EPCO

KNOBS

FOR FINE FURNITURE AND CABINETS



Each EPCO knob is carefully designed for beauty, durability and easy installation. Each is machined from aluminum or brass bar stock. Brass is in all standard hardware finishes. Aluminum is anodized clear, brass bronze or black.

Free 44-page catalog on all EPCO Knobs, Pulls, Magnetic Catches and sliding door hardware available on request.

See Sweet's Catalog under Arch. file 19g-En and Light Const. file 7b-En.

THE ENGINEERED PRODUCTS CO.
P.O. BOX 108 FLINT, MICHIGAN

EPCO

PULLS FOR DRAWERS AND SLIDING DOORS

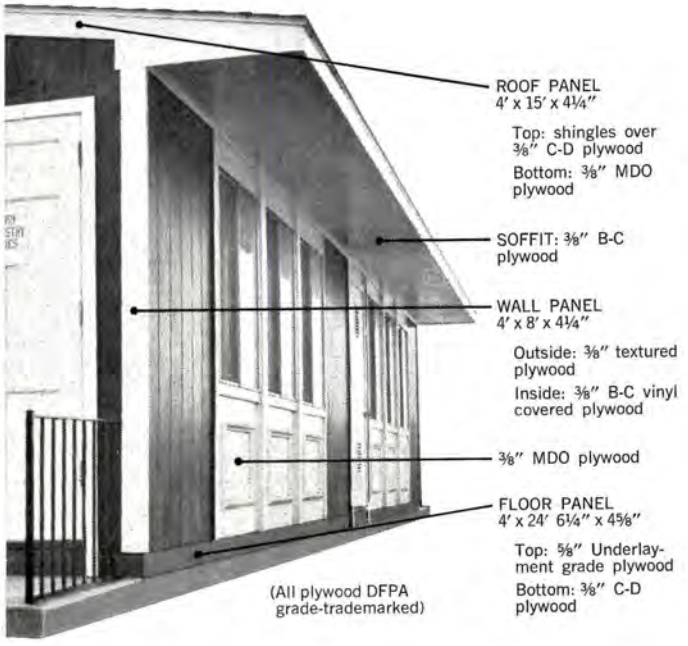
Each EPCO pull is designed for handsome appearance, ease of installation and to be maintenance free. They are of extruded aluminum, finished anodized clear, brass, bronze or black. Most are standard 3⅞" size. Special 6-ft. lengths for cutting on the job are available.

Free 44-page catalog on all EPCO Pulls, Knobs, Magnetic Catches and sliding door hardware available on request.

See Sweet's Catalog under Arch. file 19g-En and Light Const. file 7b-En.

THE ENGINEERED PRODUCTS CO.
P.O. BOX 108 FLINT, MICHIGAN

For more data, circle 167 on inquiry card



The 18 classroom buildings are 24x40; the library, faculty offices and rest rooms are 24x32.

This is another example of the way plywood components can provide simple, good-looking structures in a hurry. But they're also versatile enough to solve sophisticated design problems involving unusual shapes such as curved roofs, folded plates and space planes. For more information on plywood components and other plywood building systems, send the coupon.

Blue chip.

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Published as a public service in cooperation with The Advertising Council and the Council for Financial Aid to Education.

COUNCIL FOR FINANCIAL AID TO EDUCATION

SPECIAL TO CORPORATE OFFICERS—A new booklet of particular interest if your company has not yet established an aid-to-education program.

Write for: **'HOW TO AID EDUCATION—AND YOURSELF.'** Box 36, Times Square Station, New York, N. Y. 10036.

ON THE CALENDAR

NOVEMBER

15-17 Fall Conference, Building Research Institute—Mayflower Hotel, Washington, D.C.

21-22 11th Annual Meeting, National Better Heating-Cooling Council—Summit Hotel, New York City.

DECEMBER

4-8 Annual Convention-Exposition, National Association of Home Builders—Chicago.

JANUARY

3 22nd Annual Conference, Reinforced Plastics Division, Society of the Plastics Industry—Shoreham Hotel, Washington, D.C.; through February 3.

4-7 Winter Meeting, National Society of Professional Engineers—American Hotel, San Juan, Puerto Rico.

OFFICE NOTES

OFFICES OPENED

The San Francisco-based firm of **Dreyfuss & Blackford Architects & Planners** has opened a Sacramento office at 3540 Folsom Blvd.

R. Don Emerson, Architect, A.I.A. has opened an architectural practice at 413 West 15th St., Austin.

Robert Martin Engelbrecht And Associates announces the opening of a new office, the **Planning And Design Center,** at 12 Nassau, Princeton, N.J.

An office for the practice of architecture has been opened at 97 Pepperidge Circle, Fairfield, Conn. by **Michael J. Girardi, A.I.A., Architect.**

William C. Shopsin, A.I.A. announces the opening of an office at 501 East 87th St., New York City.

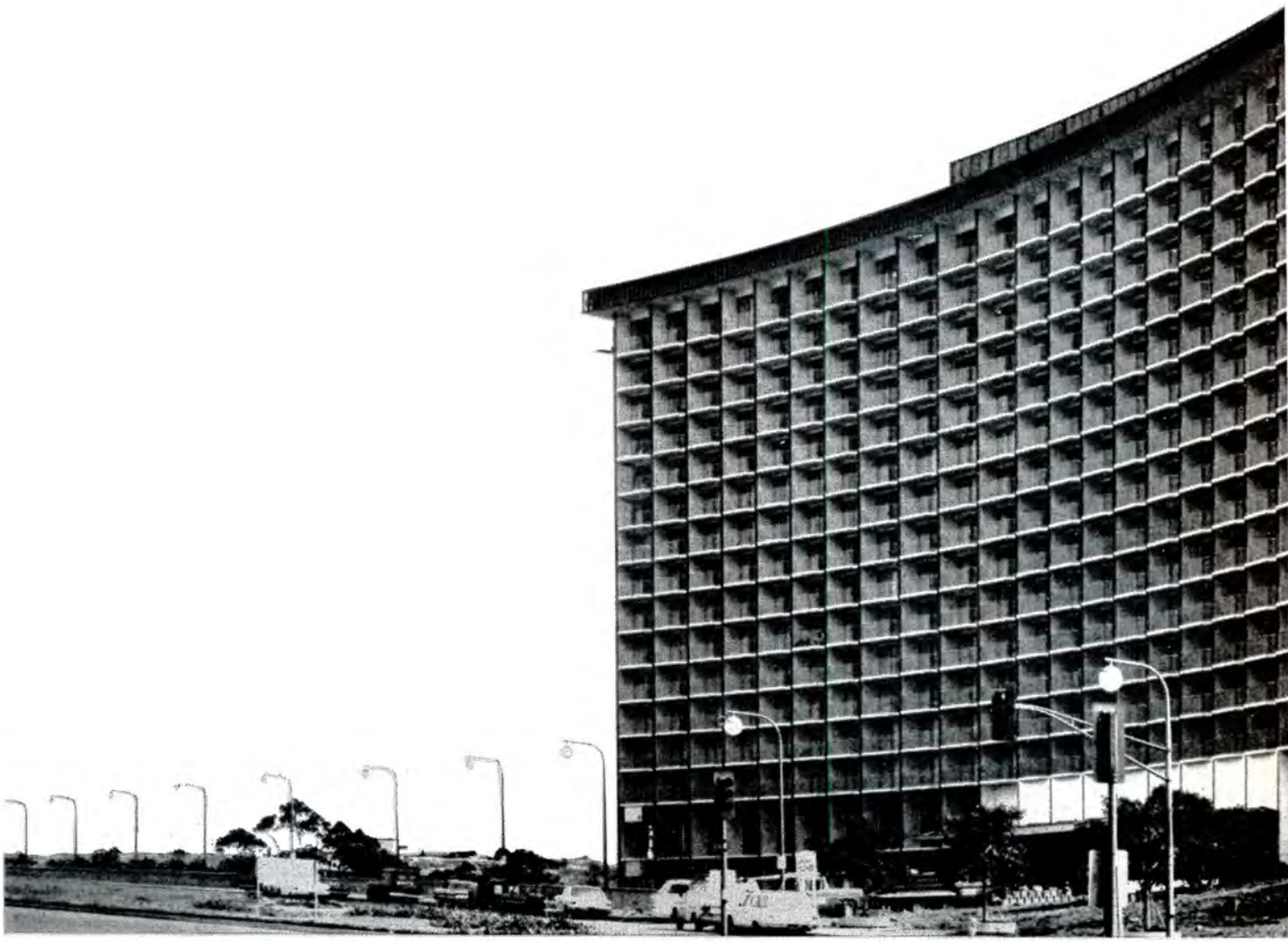
E. Ernest Waymon and **Thomas P. Fidance** have opened an office to be named **Waymon and Fidance Architects** at 1035 Philadelphia Pike, Wilmington, Del.

NEW FIRMS, FIRM CHANGES

A partnership for the practice of architecture, **Harder and Reed, A.I.A. Architects,** has been formed by **Theodore R. Harder, A.I.A.,** and **Thomas A. Reed, A.I.A.** The firm will be located at 891 High St., Worthington, Ohio.

continued on page 302

For more data, circle 150 on inquiry card



Unique design to resist

The new Century Plaza Hotel in Los Angeles is 20 stories high and is located in earthquake Zone 3. In what is believed to be a first, the designers combined the ductility of the steel rigid frame and the stiffness of X-bracing to make this structure earthquake-resistant. The unique structural system permitted a story height of

earthquake forces

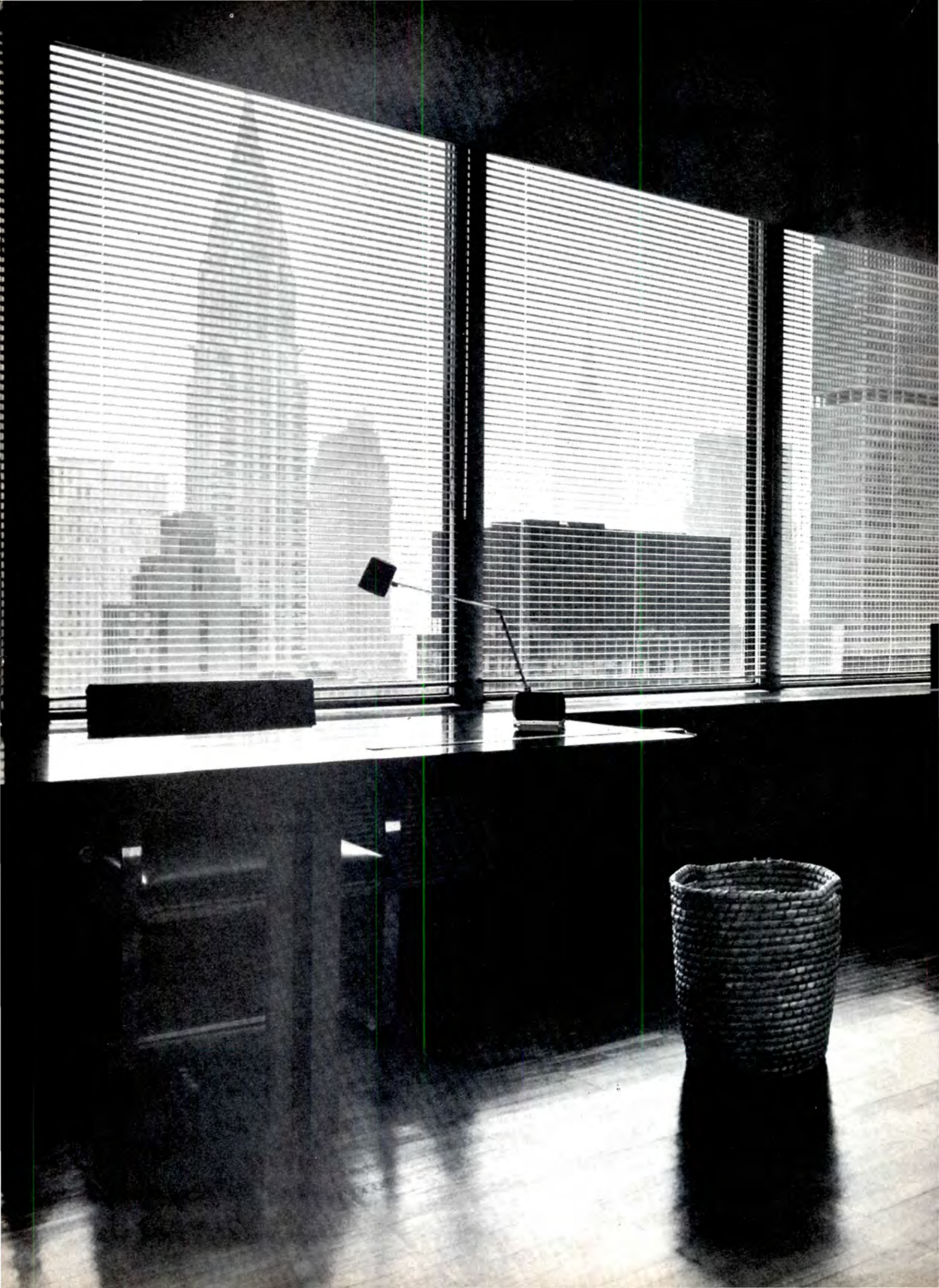
only 8′ 10″ with a floor to ceiling height of 8′ 5½″, with no beams projecting into the rooms or corridors. This integration of structural and architectural space meant low unit cost and very low unit weight per square foot of floor area.

This is another example of what can be accomplished with steel and imagination.

Architects—Minoru Yamasaki and Associates • Structural Engineers—Worthington, Skilling, Helle and Jackson • General Contractors—George A. Fuller Company, Inc. • Owner—Aluminum Company of America • Operated by—Western International Hotels • Fabricators and Erectors—American Bridge • Weight of Structural Steel—3,800 tons—ASTM A36

USS TRADEMARK

American Bridge
Division of United States Steel



THE WINDOW COVERING EVERYONE HAS BEEN WAITING FOR.

AT THE TOP, A LOW METAL HEAD —ONLY 1″ HIGH—WITH A GEARED TILTER THAT OPERATES AT THE TWIST OF A TRANSPARENT WAND. AN ENTIRELY NEW DEVELOPMENT BY LEVOLOR LORENTZEN.

THE ALUMINUM SLATS OF LEVOLOR QUALITY AND FINISH ARE ONLY 1″ WIDE; THE LADDER SUPPORTS OF BRAIDED POLYESTER YARN GIVE THAT ALMOST-INVISIBLE LOOK. TESTS HAVE PROVEN THE LONG LIFE OF THE POLYESTER LADDER SUPPORTS.

FOR APPEARANCE BOTH FROM INSIDE AND OUTSIDE, THE LEVOLOR-RIVIERA IMPARTS AN AIRY FEELING OF THE OUTDOORS—ALMOST AS IF THERE WASN'T A BLIND AT THE WINDOW, YET WITH ALL THE SUN CONTROL OF THE CONVENTIONAL BLIND.

LEVOLOR RIVIERA
THE MAGIC WAND BLIND

FOR FURTHER INFORMATION AND SPECIFICATIONS WRITE:
SPECIFICATION DEPARTMENT
LEVOLOR LORENTZEN, INC.
720 MONROE ST., HOBOKEN, N.J.

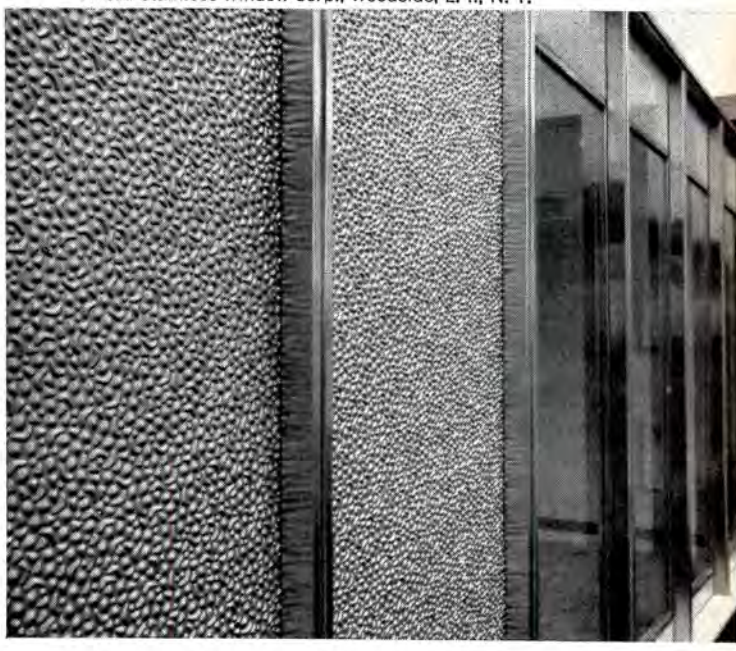
LUSTROUS stainless steel spandrels with No. 4 finish alternate with white marble piers at Kirkeby Center, Los Angeles, California. Architects: Claud Beelman and Associates, Los Angeles, Cal. Spandrels, fluted to provide stiffness and eliminate optical distortion, by Construction Metalwork Corp., El Monte, Cal.

BOLD USE of stainless emphasizes major structural elements of the Phoenix Mutual Life Insurance Building, Hartford, Conn. Stainless also provided articulation for major mullions of the tower, and was a practical solution for window washing tracks. Architects: Harrison and Abramovitz, New York, N. Y. Stainless steel column covers: General Bronze Corp., New York, N. Y.

LONG LIFE and maintenance free service were among the reasons for installing 3,000 distinctive, all-stainless steel "Nordic" design locksets in the Equitable Life Assurance Building, New York, N. Y. Architects: Skidmore, Owings & Merrill, New York, N. Y. Stainless steel locksets: Eaton Yale & Towne, Inc., Rye, N. Y.

MIRROR FINISHED stainless steel accents red marble and blast-finished granite and provides durability with minimum maintenance in the Sun Life Building, Baltimore, Md. Architect: Peterson and Brickbauer, Baltimore, in association with Emery Roth & Sons. Stainless steel entrances, column covers and window framing: Allied-Superb Bronze Corp., New York, N. Y.

DESIGN FLEXIBILITY—Stainless steel curtain wall with rigidized textured panels and stainless steel windows at the Merrit Industrial Park Building No. 2, Fishkill, N. Y. Architect: Louis Battoglia, AIA, Fishkill, N. Y. Curtain wall, panels and windows: United Stainless Window Corp., Woodside, L. I., N. Y.



If you've wondered why so many architects design office buildings with nickel stainless steel... just look around you.

Note the clean, lustrous look of nickel stainless steel.

But stainless is more than just decorative. It's practical and functional.

The high strength of stainless permits the use of light economical gauges.

It's tough. Takes practically unlimited wear and tear.

It's so corrosion resistant you needn't be concerned about it streaking or staining adjacent materials.

Stainless has the lowest maintenance cost of all architectural metals. Ordinary detergent and water keep it looking like new.

And nickel stainless steel emphasizes and enhances good design. Its soft, enduring luster complements, reflects and highlights surrounding materials and colors.

Where? In curtain walls, entrances, windows, railings, hardware, flashings and decorations.

In your next office building design.

Want to know more? Write for Inco's informative "Stainless Steel Architectural Fact Sheet." The International Nickel Company, Inc., 67 Wall St., New York, N. Y. 10005.

INTERNATIONAL NICKEL

For more data, circle 153 on inquiry card

LOW MAINTENANCE in high traffic areas with lustrous stainless steel elevator doors and cabs, at the Erieview Plaza, Cleveland, Ohio. Architects: Harrison & Abramovitz, New York, N. Y. Stainless steel elevator doors and cabs: The Tyler Co., Cleveland, Ohio.

continued from page 295

Joseph Charles Chambers and **Leonard Colchamiro** have joined architect **Delnoce Whitney Goubert** of New York City as project architects.

Henningson, Durham & Richardson, of Omaha, Neb. has acquired a controlling interest in an international architectural-engineering firm headquartered in Rome, Italy. The European-based operation will be known as **Whiting, Durham & Richardson.**

Marcus E. Weston, architect, has become an associate of the Madison, Wis. firm of **Keaser & McLeod, Architect Engineer Associates.**

Albert Kahn Associated Architects and Engineers has realigned staff functions and responsibilities as follows: **D. H. Shahan,** director of structural and civil engineering, with **T. C. Halliday** as administrator of the department; **A. Zweig,** chief structural engineer; **F. Kramrisch,** chief civil engineer; **A. Annala,** administrative assistant to the supervisory staff of the architectural department.

The partnership of **Lacz and Lacz, Architects and Engineers,** at 50 Hamilton Street, Paterson, N.J., has been formed by **Stanley and John Lacz.**

George Whiting Lund, A.I.A., and **C. James Balderson, A.I.A.,** have organized a new architectural firm, located in Suite 200, Lenexa Professional Building, 13001 West 95th St., Shawnee Mission, Kan.

Edgar H. Hunter, A.I.A., of the former Hanover, N.H. firm of E. H. and M. K. Hunter, has been appointed a vice president in the architectural firm of **Lyles, Bissett, Carlisle & Wolff, A.I.A.** Mr. Hunter will direct the Raleigh, N.C. office of this Columbia, S.C.-based firm. **Roy W. Banwell, Jr.** will head a new architectural firm with offices in the Musgrove Building, Hanover, to succeed the E. H. and M. K. Hunter firm.

Marshall & Brown, A.I.A., architects and engineers of Kansas City, Mo., has appointed **Edwin W. Korff** a partner.

Dennis D. Hellesivg has been made associate architect with the Eugene, Ore. firm of **Morin & Longwood, A.I.A.**

Charles Neenan, formerly with C.B.S. Television Network Engineering, has formed **Charles Neenan Associates** in Bridgewater, Conn., to offer a consulting service for television and theater lighting and for the audio-visual fields.

Paul J. Hueber, A.I.A., Anthony W. Kotz, A.S.L.A., and George P. Newton, P.E., have become partners in the firm of Pederson Hueber Hares and Glavin, architects, landscape architects and engineers of Syracuse, N.Y.

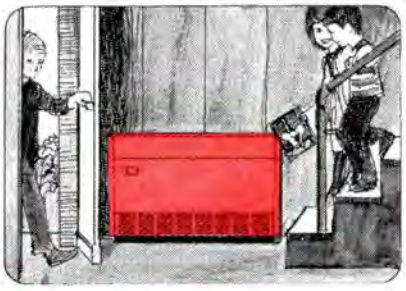
continued on page 306

Look to Chromalox®

for the right answers to electric comfort heating/cooling problems in buildings

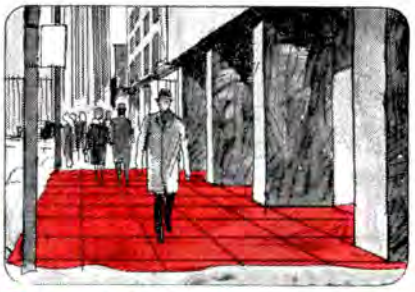
[Office Areas] Chromalox Modulaire year-round Air Conditioners are compact, through-the-wall, self contained units which provide complete comfort conditioning including electric heating, refrigeration cooling, dehumidification, ventilation and air filtering for lounges, classrooms, offices, meeting rooms, churches and similar areas needing air conditioning.

Request Bulletins F03100 and F03102



[Entranceways] Chromalox Electric Cabinet Unit Heaters are compact, blower type, high capacity heaters designed primarily for applications in entranceways, corridors, lobbies. They are available in decorator style models for floor, wall and ceiling mounting; free standing, semi-recessed and fully recessed units.

Request Bulletin F22100

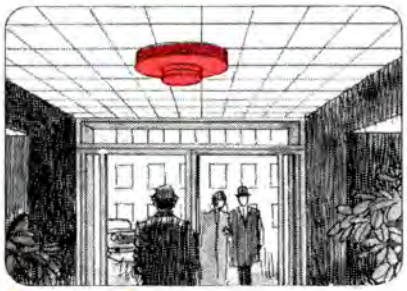


[Snow Melting] Chromalox Electric Heater Mats and MI Heating Cable are embedded in concrete or asphalt sidewalks, driveways, ramps and steps to keep surface areas free of ice and snow. They eliminate manual labor and related costly agents such as salt, cinders and chemicals which often are tracked indoors to stain rugs and floors.

Request Bulletins M60100 and PJ-102

[Marquees] Chromalox Electric Infrared Marquee Heaters provide spot comfort whatever the weather outdoors. They project radiant warmth on people and help keep sidewalks free of ice and snow at building entrances. Easy to install, designed for either recess or surface mounting.

Request Bulletin F70100



[Lobbies] Chromalox Type VUH Ceiling-Mounted Electric Vertical Unit Heaters are installed in entryways and stairwells to form a warm air barrier to cold outdoor air. Optional discharge air diffusers provide a choice of five heat distribution patterns. Larger sizes up to 50 KW are ideal for high bay mounting.

Request Bulletin F15100

[Reception Areas] Chromalox Electric Sill Line and Baseboard Units are available in a wide range of models and heating capacities. Sill lines are usually mounted under windows, baseboards at floor level for continuous wall-to-wall heating in offices, reception areas, corridors and similar applications.

Request Bulletins F31100 and F50100

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FIRST NAME IN ELECTRIC HEAT

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electric
HEATING / COOLING

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- ☐ **Cabinet Unit Heaters (F22100)**
- ☐ **Sill Line—Baseboard Heaters (F31100, F50100)**
- ☐ **Snow Melting (M60100, PJ-102)**
- ☐ **Infrared Heaters (F70100)**
- ☐ **Unit Heaters (F15100, F14100)**

NAME _____ TITLE _____

AFFILIATION _____

ADDRESS _____

CITY, STATE, ZIP CODE _____ PHONE _____

WC-81A

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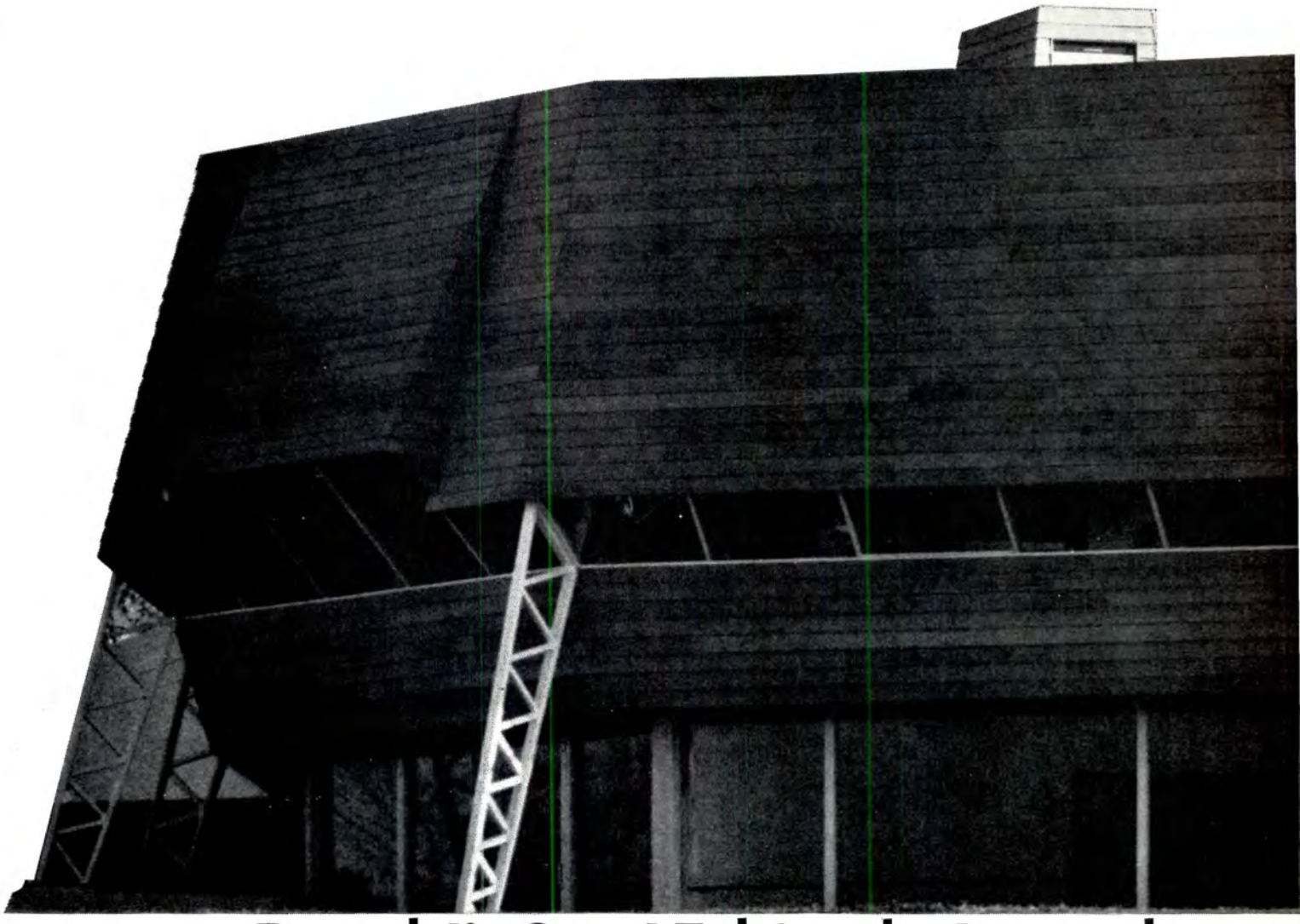
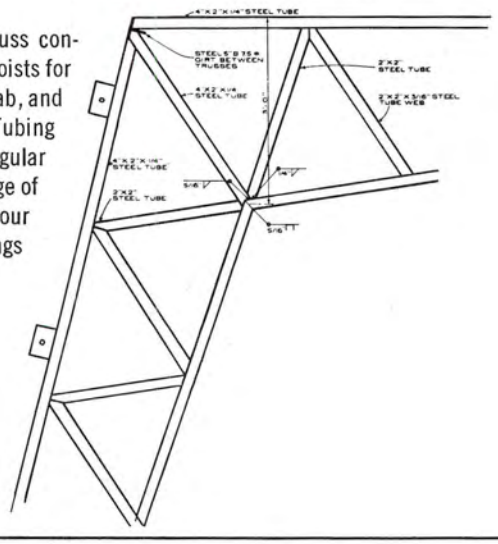
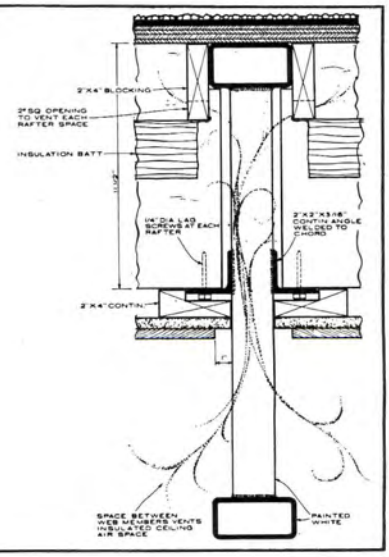


Republic Steel Tubing helps make

Detailed truss, left, and typical joist to truss connection, right, show steel trusses and wood joists for church roof, reinforced concrete frame and slab, and concrete block infilling. Republic Structural Tubing is available in round, square, and rectangular shapes in a full range of sizes. Take advantage of this high strength welded steel tubing for your next design and construction project. (Drawings courtesy of Progressive Architecture.)





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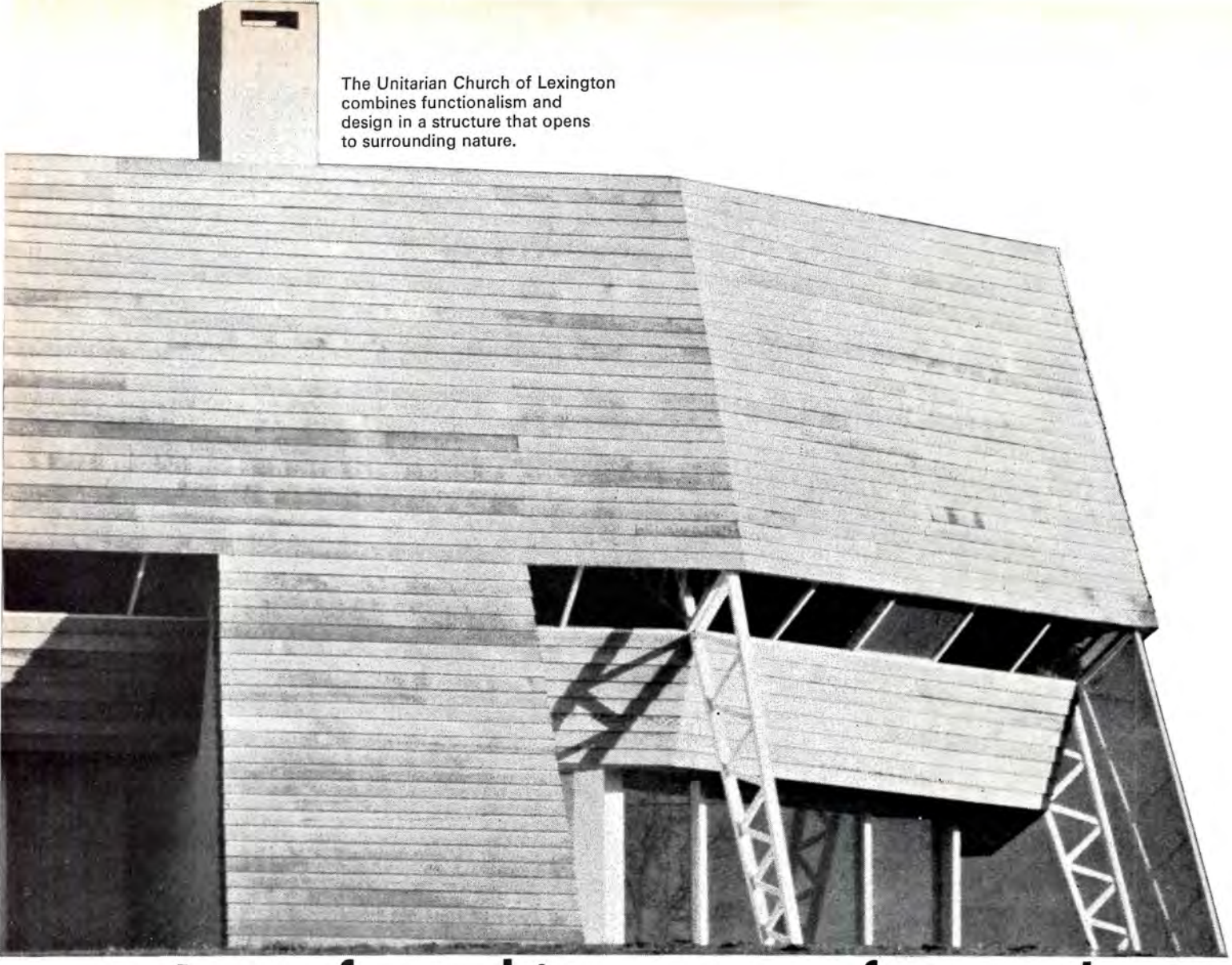

The Unitarian Church of Lexington combines functionalism and design in a structure that opens to surrounding nature.

place of worship a tower of strength.

Architect Herb Greene specified Republic Structural Tubing for trusses in the new Unitarian Church of Lexington, Ky.

The Unitarians of Lexington wanted their new church to be more than just a meeting place for Sunday services. It had to accommodate weddings and square dances and musicales, plus a theater-in-the-round. And it all had to be accomplished with a small budget.

So, architect Herb Greene set to work. He designed a church of steel, concrete, and wood.

The finished two-story structure is supported by ten Republic Structural Steel Tubing trusses. Each truss member is welded onto an I-beam at a point 10 feet from the center of the compression ring. Truss, beam, and ring form an arch that runs into the ground and is bolted onto a concrete footing.

Not only do the white-painted steel trusses add a decorative touch inside, they look like supporting stilts on the outside . . . placed to keep the heavy wooden "umbrella" from tipping.

The Unitarians now have their church. And it's more than just a building. Utilizing Republic Structural Steel Tubing, Herb Greene made it an economical tower of strength.

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continued from page 302

John M. Baird has joined the Chicago firm **P & W Engineers, Inc.** as a principal mechanical engineer, while **John A. Sbarounis** has joined as a principal structural engineer.

Urban Design Associates is a new firm formed by **Geoffrey Copcutt, A.R.I.B.A., David Lewis, A.R.I.B.A.,** and **James N. Porter, A.I.A.,** at 3508 Fifth Ave., Pittsburgh, Pa.

John Peter Varsa and **Wallace A. Wendell** have formed the new firm of **Wendell and Varsa, A.I.A. Architects-Planners,** 5400 Phoenix Ave., Northeast Albuquerque, N.M.

NEW OFFICES

H. J. Degenkolb & Associates, Consulting Engineers, 86 Third St., Suite 500, San Francisco.

H. I. Feldman, A.I.A. Architect, Chanin Building, 380 Lexington Ave., New York City.

Hillman Garmendia Architects, 122 East 37th St., New York City.

Nolen Swinburne and Associates, 120 South 17th St., Philadelphia.

Walker & McGough, Architects, North 120 Wall St., Spokane, Wash.

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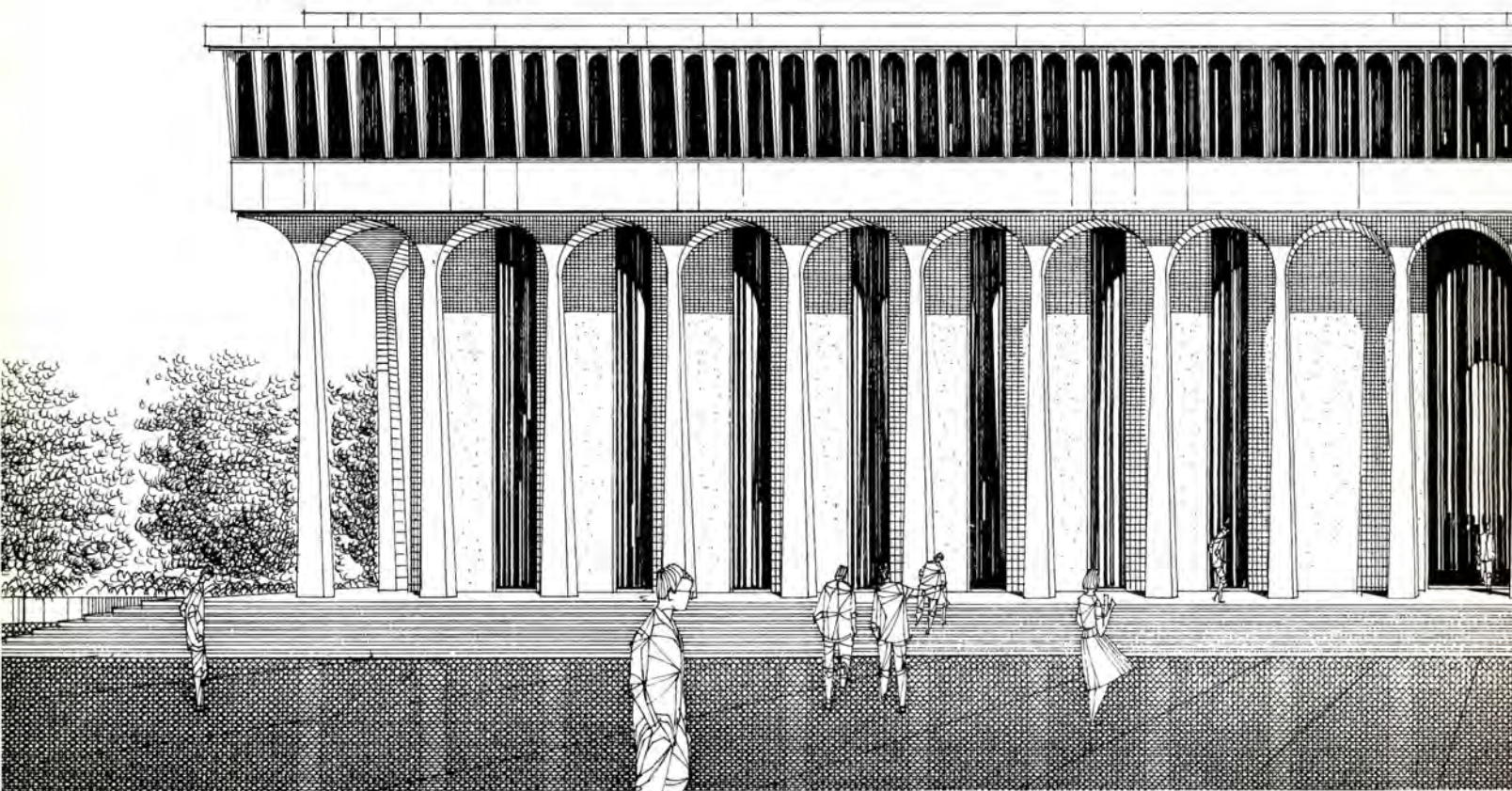
Woodrow Wilson School of Public and International Affairs
Princeton University, Princeton, New Jersey
Architects: Minoru Yamasaki and Associates



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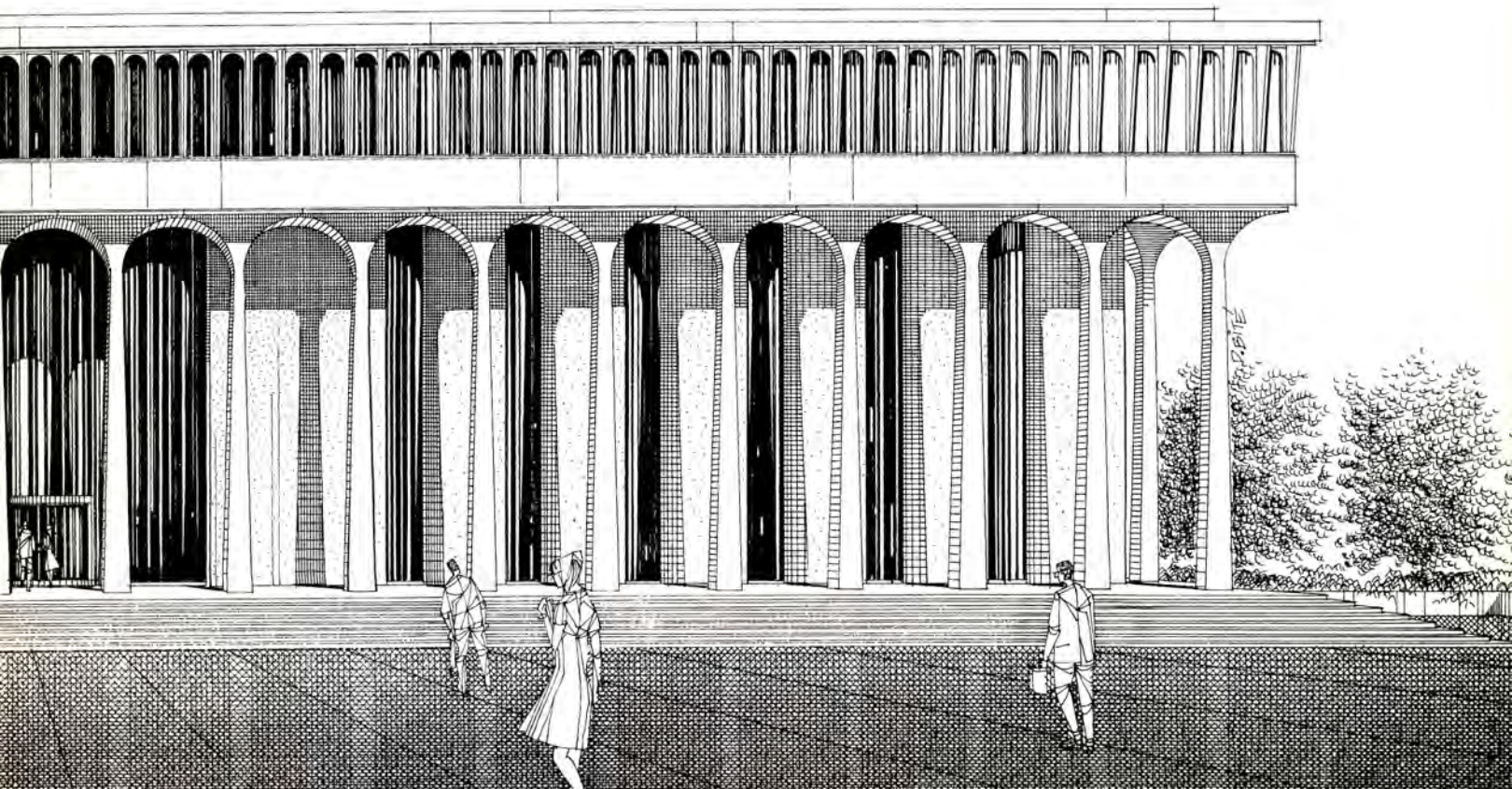

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Architect solves complex roof problem with

REVERE COPPER

PROBLEM: To find a roof covering . . .

1—That must be on a warped surface, with a slope varying from 3/12 to 36/12

2—That has a texture and pattern which will complement a dramatic shape

3—Whose color will complement a natural wooded surrounding

4—Whose nature would be compatible with other permanent materials used, i. e. stone and glass

SOLUTION: COPPER—with standing seam pattern of lines running at right angles to the curving ridge to dramatize the changing slope.

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As to the preference for Revere copper, Mr. Leo Muza, Muza Sheet Metal Company, contractor, had this to say, "We specialize in copper work and like to deal with people who know their business. We use Revere copper exclusively, and have had consistently good results. Revere also can provide technical assistance to the architects and to us . . . and they maintain good jobber relations."

ALL-FAITHS CHAPEL, State of Wisconsin's New Kettle Moraine Boy's School, Plymouth, Wisc., where 20,000 lbs. of Revere 16 oz. cold rolled copper were used for the unique, standing seam roof and fascia.

Architect: DAVERMAN ASSOCIATES, INC., Grand Rapids, Michigan. *General Cont.:* HUTTER CONSTRUCTION COMPANY, Fond du Lac, Wisc. *Sheet Metal Cont.:* MUZA SHEET METAL CO., Oshkosh, Wisc.

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A Architectural File (green)
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