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ENVIRONMENT AS DESIGN INSPIRATION: AN ARTICLE BY BENJAMIN THOMPSON

ATLANTA'S ONE-MAN RENEWAL PROGRAM

BUILDING TYPES STUDY: APARTMENTS

SYDNEY OPERA HOUSE: THE ENGINEER'S VIEW

FULL CONTENTS ON PAGES 4 AND 5

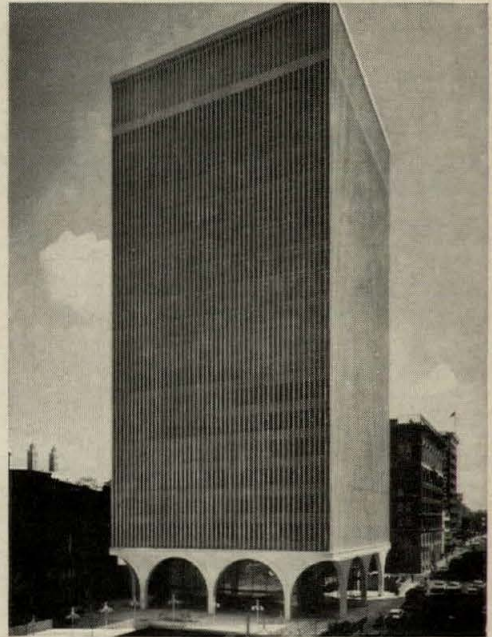
ARCHITECTURAL RECORD

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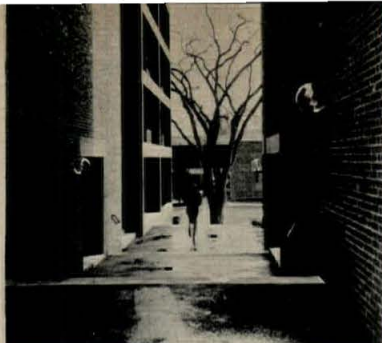
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FEATURES

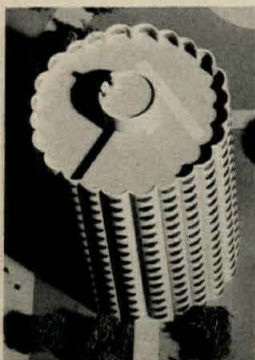
- 107 **LET'S MAKE IT REAL**
Benjamin Thompson's proposal for a controversial new method for the teaching and doing of architecture which puts students where the problems are.
- 110 **REFLECTIONS ON ENVIRONMENT**
An important addition to Thompson's central theme: A four-color visual essay which suggests that architects can best find their inspiration for design in the beauty of the real world all around us.
- 121 **ARCHITECTURAL DETAILS—ELIOT NOYES**
Seventh in a series of presentation details of significant architecture.
- 133 **JOHN PORTMAN: ATLANTA'S ONE-MAN URBAN RENEWAL PROGRAM**
More than half of Edwards and Portman's buildings are for projects in which Portman has a financial interest. Third in a series on young architects who are building a successful practice with work of notable quality.
- 141 **PRIVATE BUILDING RESPECTS PUBLIC SITE**
Pietro Belluschi's design for Rohm & Haas establishes a standard of dignity and restraint for private development of Philadelphia's Independence Mall.
- 149 **SIX HOUSES FROM ABROAD**
A collection of foreign houses which gives insight into the way architects around the world are approaching the problems of house design.



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**BUILDING TYPES
STUDY 354**

- 155 **APARTMENTS: THE PROBLEM IS NOT JUST MORE SPACE**
This month's study examines significant recent progress in the search for new forms, new thinking in the public housing struggle, new engineering approaches to environment... the new thinking that can make apartments places for people to live, and not just places to store people.
- 156 **MERRYWOOD: A TIERED CLUSTER PLAN SAVES LAND**
A town-house approach to higher-cost housing by architect Victor Gruen.
- 158 **A NEW KIND OF PUBLIC HOUSING: NEW FORMS FROM NEW CONCEPTS**
Bertrand Goldberg's design avoids "the monotony."
- 160 **SHEER TOWER IN CHICAGO**
"... one of the most sophisticated of SOM's sophisticated designs."
- 162 **NORWEGIAN TERRACE HOUSING ON AN UNBUILDABLE HILLSIDE**
A 54-unit project with ideas adaptable to our bypassed hillside land.
- 164 **WOODLAKE: A SMALL COMMUNITY COMPLETE WITHIN ITSELF**
Architect and landscape architect team up to create a new environment.



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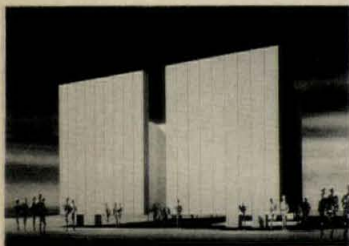
CONTENTS: JANUARY 1966

ARCHITECTURAL ENGINEERING



- 166 A SLUM COMMUNITY'S PLAN FOR CREATING ITS OWN ENVIRONMENT
Architect William Conklin's redesign for some of New York's "worst blocks."
- 168 MINIMUM STANDARDS VS. MINIMUM DECENCY
A neighborhood core of decent living by designer Roger Katan.
- 170 A MIES APARTMENT CREATES ITS OWN ENVIRONMENT
This serene and elegant design sets itself apart from its neighborhood.
- 175 SYDNEY OPERA HOUSE: THE ENGINEER'S VIEW
The architect's design did not lend itself to an efficient structural solution. The engineer knew, however, that changing the shape to improve the structural economy would have destroyed the concept.
- 181 UNDERGROUND RESIDENTIAL DISTRIBUTION
As more and more wiring is forced underground by FHA directive, local laws, and our increasing concern for natural beauty, the utilities are exploring new techniques to accomplish the job at reasonable cost.
- 189 BUILDING COMPONENTS
A new locking system with three rows of pins improves building security.
- 191 PRODUCT REPORTS
- 192 OFFICE LITERATURE
- 247 READER SERVICE INQUIRY CARD

THE RECORD REPORTS



- 9 BEHIND THE RECORD
"Forward Progress in Design and Printing," by Emerson Goble.
- 35 THE RECORD REPORTS
- 40 BUILDINGS IN THE NEWS
- 44 CURRENT TRENDS IN CONSTRUCTION
- 46 BUILDING CONSTRUCTION COSTS
- 78 REQUIRED READING
- 104 CALENDAR AND OFFICE NOTES
- 282 ADVERTISING INDEX

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COMING IN THE RECORD

HOUSE DESIGN AS ARCHITECTURAL FRONTIER

Every architect knows that houses designed by architects tend to lead, not follow, the general direction of architecture; and the house continues to be one of the most eternally important and fascinating of architectural problems. Ten years after the first issue of RECORD HOUSES, we take a searching look at the houses presented in the first 10 issues, and offer a critical evaluation of the architectural significance, and relevance for the future, of house design as RECORD HOUSES has shown it. Several houses will be shown in color.

ARCHITECTURE FOR CHANGING WAYS OF TEACHING

Schools are today demanding more architectural innovation than ever before, as educators experiment with new ways of teaching. They are getting architectural results of very high quality and a wide variety of solutions, as next month's Building Types Study on schools will show. There will also be a look at that controversial concept for "centralizing" urban school systems—the "educational park."



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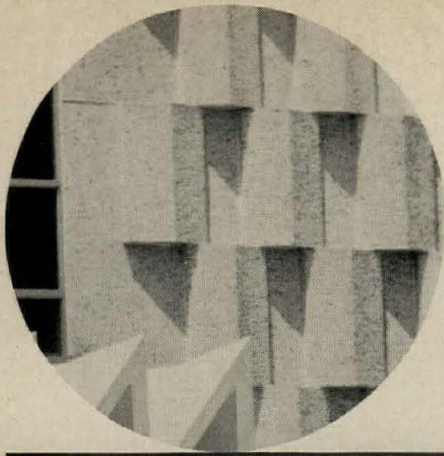


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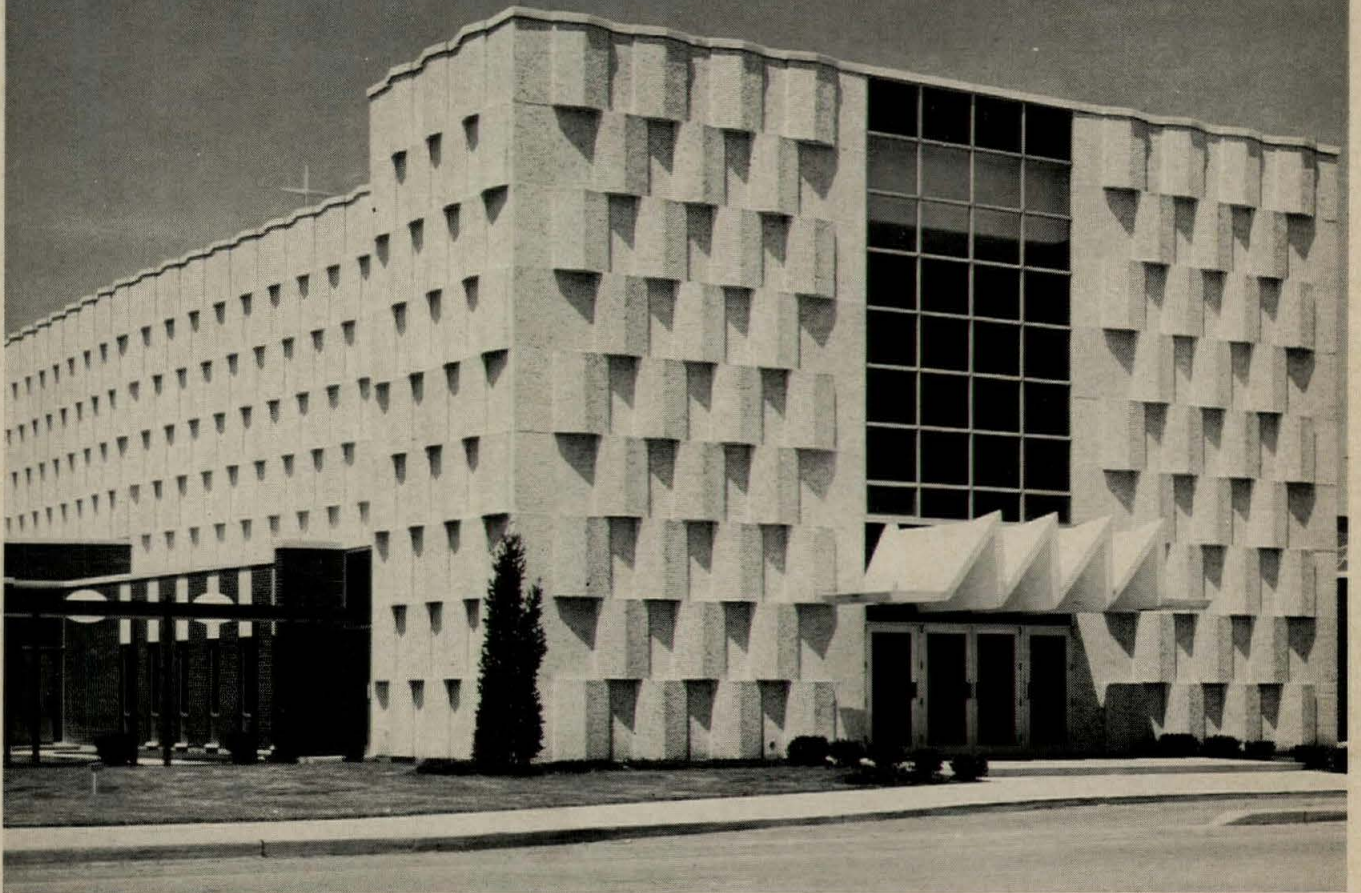
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FORWARD PROGRESS IN DESIGN AND PRINTING

You will have noticed by now that the RECORD has been redesigned. Yes, indeed it has, and we hope that you will like the new format as well as the staff does. Perhaps by now you will have noticed that the quality of printing and graphic reproduction has greatly improved. For along with our new design we have a new printer and an improved printing process with considerable potential for more and better color and more sensitive reproduction of all photographs and drawings.

As for the new design, you might be interested in some staff thinking about what a magazine design should express, and perhaps in a few anecdotes. First, if you have a slight feeling that the visual revitalization was overdue, you would find plenty of agreement in the RECORD offices. This note was expressed, by implication at least, by a good friend, a "name" architect, when he heard of the plans. "Oh, that's wonderful," he said, "that's just what the RECORD needs. It should be redesigned, but I certainly hope that you don't change anything else."

This was not a bad expression of our intent—as to design, that is. And I might say in passing that we held off long after the itch had developed, until the new printing and reproduction process were available, so that the new

design could mesh with the new potentials. After the contract was signed, by the way, the new design became a mammoth charette, because of calendar considerations.

We have hoped that our new format and new type face will be a more attractive and more adequate expression of what the RECORD sees as its purpose and responsibility: to be a "complete" and authoritative magazine for architects. The briefing to the design consultant, then, was essentially: the same magazine self-determination (though it is continually changing in execution), no side show, no tinsel, no fashionable cliché like narrow vertical columns climbing up and down. Not frumpy, please, but no Beatle haircuts. The best in design, but we shall not let you forget the purpose of the magazine.

I must say for our consultant—whose name is Jan White and who is, by the way, a graduate architect—that he thoroughly understood the relationship of abstract design to function.

One more philosophical note: as I said, the magazine is continually changing—in execution, not in fundamental purpose—and change was one reason for our new design, one purpose in our effort. As briefly as possible: architectural magazines change with architecture, and architecture right now

is busy with new purposes, new services, new problems. So an editor's efforts increasingly call for something more than big pictures of great works. And the format must then be suited to its subject matter.

I mentioned earlier that color will be more readily available to us. Color, when it is necessary, will be there, and it will be better in reproduction and printing. Color will be readily available for charts, diagrams, sections, and the like — even for duotone emphasis of black-and-white photographs. But we promise to use it sparingly, for reasons I will explain later.

The better reproduction of color, both in editorial and advertising pages, was another of the main reasons for the change. The presses (web offset) run at high speed, but they can touch the paper very lightly with the ink. The range in tone, in both color and black-and-white, is greater than in normal letterpress processes. Incidentally, not all offset works as well; there is great range in offset quality. The new printer is Judd and Detweiler of Washington, D. C. They are a large firm with a wide range of quality work; for many years they printed the National Geographic.

How much of this tempting color shall we use? The answer, at the moment, is not too frightfully much, for a couple of reasons. One is that, in spite of what people keep telling us, it is our conviction that color is frequently a handicap in studying architecture. The second reason grows out of the first: in our experience there is not too much good color. The work that we generally see does not tempt us to bathe our pages in color.

A bit more on that: many architects frequently ask us why we don't use more color. They like color, as who



"At any moment in a form-making process, each of the variables involved is in a state of either fit or misfit... One misfit is eradicated, another misfit occurs and these changes in their turn set off reactions within the system that affect the state of other variables."

doesn't? They like their own work to be shown in color, naturally. But at the bottom of all this is the fact that in such conversations the architects are thinking of the RECORD as a public relations medium. The color, in other words, is for the purpose of glamorizing the work. But we editors are likely to be thinking about the portrayal of architecture for good understanding, and, as I said, color is frequently distracting. For, in most exteriors at least, the color is not in the building, but in the sky, the grass, the ladies' blouses. So the color jumps out forward, and the building recedes.

Yes, of course, more color is appearing on building exteriors. But I am not so sure it should, though occasionally the architect tries very hard for some nice warm tones in brick or wood, and these tones do become important to the comprehension of the whole building.

Interiors? Yes, they frequently want color, for that comprehension, and of course for that glamor, too. We have no objection to glamorizing our material, as well as making it communicate properly. We shall very likely be using our new color heavily for interiors.

What we do object to—and where we will resist our new temptation—is the use of color for the sake of color. We shall use it, as we always have, when it is useful or necessary, for we shall continue to be a strictly professional journal.

Our greatest satisfaction with the new process is likely to come, page after page, in normal black-and-white reproduction. The detail will be better, the range of tones will be larger, and the new type and the new format should add general attractiveness.

Do you remember the soft pencil

renderings of Ted Kautzky, or, still farther back, Sam Chamberlain (farther back, that is, in architectural magazines)? The range of black-and-white halftones in good offset printing is equal to the tones of the pencil. The offset process uses the screen dots for its halftones, of course, but its range of values in those dots can go right down to zero. In other words, you can have a halftone with a wide range of dot values, down to no dots at all. Thus with offset reproduction it is possible to follow exactly the original tones of the renderer.

Or, for that matter, the tone values of any of the other styles of rendering in more current favor.

In black-and-white work it is also possible to add emphasis or contrast to a photograph or drawing, by a faint underlay of background color. This color would not generally be recognized as such, but it would add visual emphasis to the blacks. It is easy to get overdramatic with this sort of thing, but I don't think this trap will catch us.

The new body and head type, in case you are graphics-minded, is called Optima. It is a new face, designed by a currently leading type designer, calligrapher, and typographer, Hermann Zapf of Germany. He has done many other new type faces designed to meet modern printing requirements; among them are Melior and Palatino.

Optima, which the RECORD will use practically exclusively, has, in our judgment, an especial quality of functional beauty. It is, strictly speaking, a sans-serif type, but the letter forms suggest vestigial serifs and thus improve the reading quality and the general suitability for magazine use. Perhaps you will remember the preoccupation with sans-serif type of 25 years ago.

Architects and other designers picked it up with dogmatic enthusiasm because it was "clean," like their architecture. Then it was discovered, after many studies, that sans-serif type was not very functional after all, because it was generally much less readable. Seems the serifs added emphasis so that the letter forms were more easily recognizable.

Well, in any case, Optima is a sans-serif type *with* serifs for easy reading. And, I feel, with beautiful letter forms.

Optima promises to become a fashionable type, though at present it is seen only in a few of the more sophisticated places. The fonts of type will be especially purchased for use in the RECORD, but the printer will undoubtedly find plenty of call for it.

Well, forgive my intrusion on this page with comments about our redesign and our new processes for magazine production. Perhaps my enthusiasm here is justified by the knowledge that architects are interested in graphic design, and they have always seemed especially interested in the graphic design by which architecture is shown.

When I told one of my good friends about it all, he said: "Why, that's wonderful news! I know all about it and it's great. But does the RECORD have a large enough run for that machine?" Yes, he knew about it, all right: the web offset process, on a five-color machine, is a fast operation intended for general magazines of much larger circulations. The professional magazine cannot realize all of the economies that go with large runs, but an architectural magazine ought to be able to afford the best printing, and we have made this move to assure that this one gets it.

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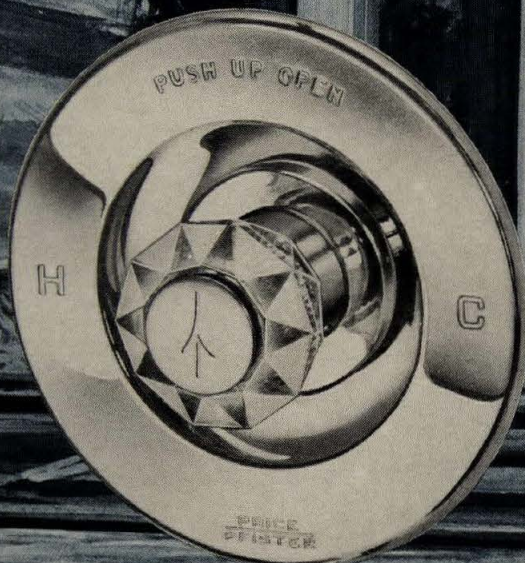
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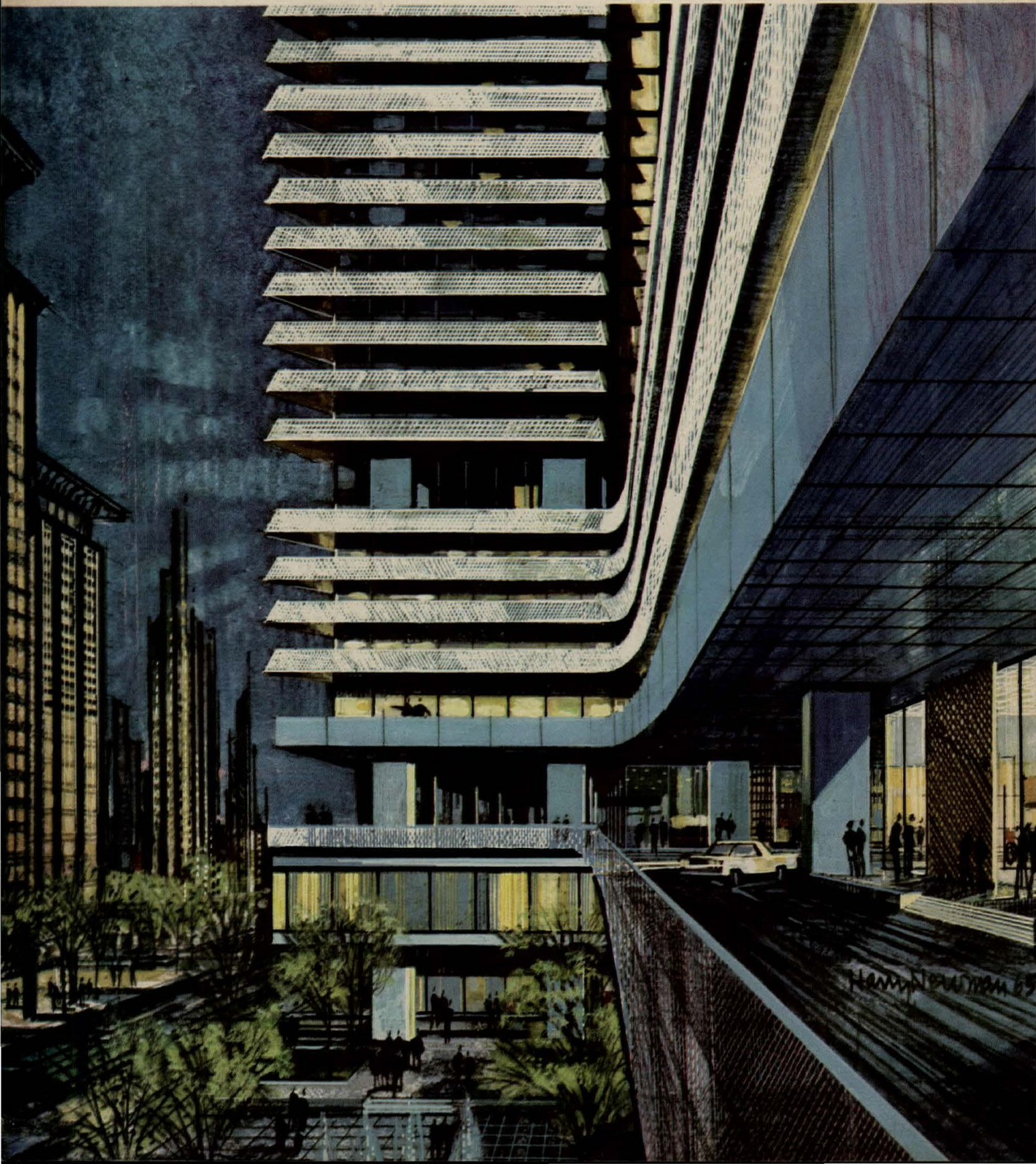
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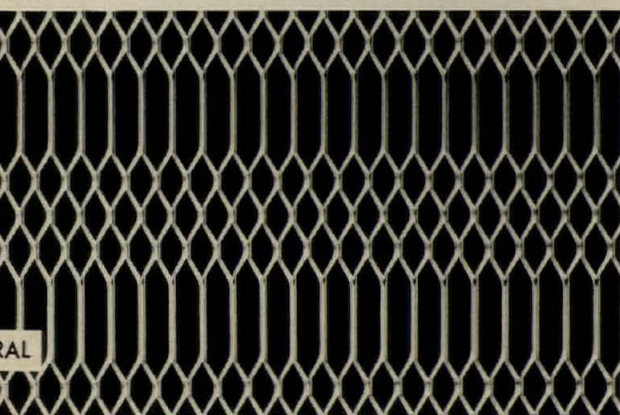


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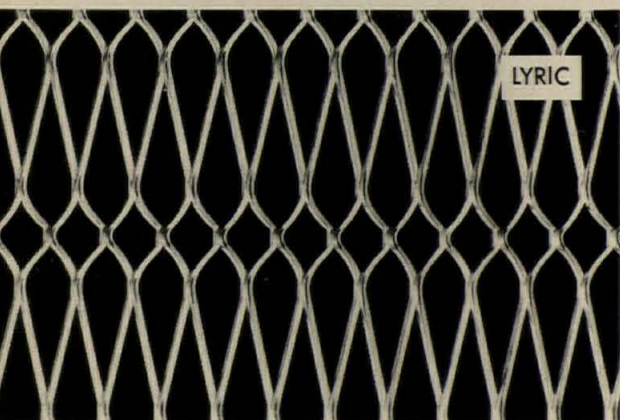
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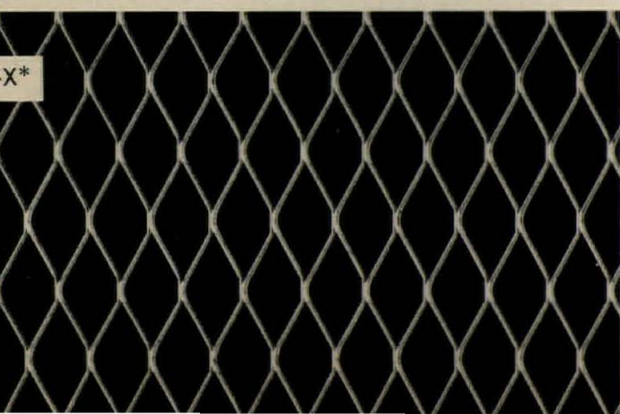
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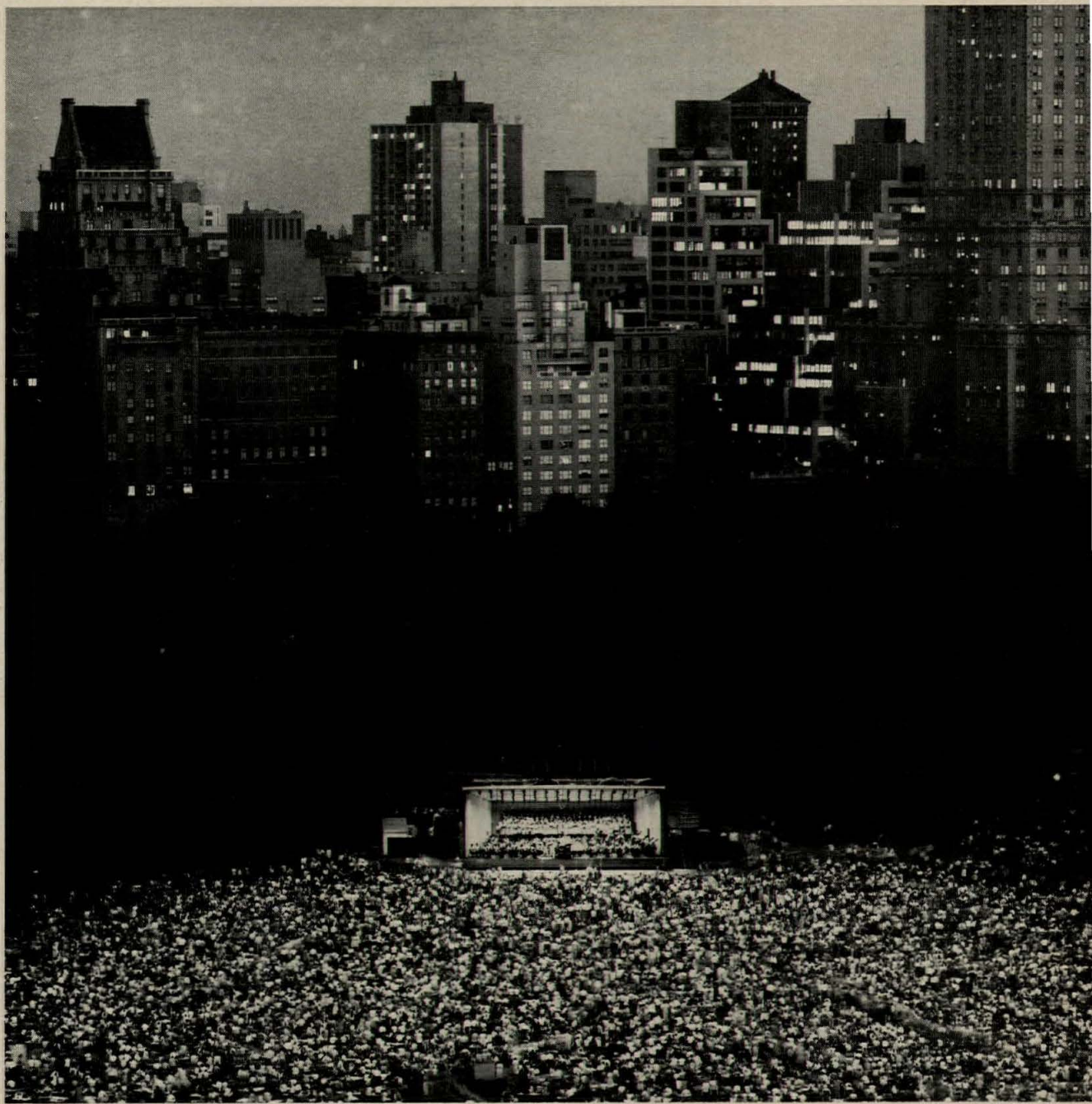
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Patience and forethought: ingredients for better cities

"We seek out the cities of the past—never those of the present," said Constantinos Doxiadis, the Greek planner and architect, when he talked recently in Seattle. A succinct and subtle and novel way of saying that there's something wrong with the way we build our cities today.

One of main things that's wrong is something that we can hardly help—at least, we can hardly help it unless we find a way to do what we must do and at the same time not do it the way it almost has to be done. For the cities of the past were not built at one fell swoop. Nor were great areas of them built by one builder. Cathedrals, as Doxiadis points out, were not built in one year, in 10 years, or in 20 years, but in generations. What makes the old city alluring and ever-interesting is not just the patina of time which enhances, but the changing viewpoint which vitalizes the city as a whole and its parts.

But how do you build a changing viewpoint? We have learned to give bronze the patina of antiquity, we can make the new look old, but how do we foresee them, how could we express them, especially on a large-scale basis?

The tract, with its infinite variation on a theme done in the name of individuality but achieving a monotonous conformity, is a one-man (or one-company) way of meeting the exigencies of economics, of real or fancied need, and of making a business venture. But it also becomes a way of building a city. And it is no longer a city of individual solutions to individual needs, each brought into being at an individual moment in an individual way. For we

are now a world of such numbers of individuals that the single individual solution is no longer the economic way.

It is ironic that the very problems of cities are not necessarily problems which suddenly developed. As Doxiadis said—again we quote from his talk to a standing-room-only audience in Seattle—"We need one or two generations to overcome the crises created by the past few generations."

For most of us, patience is no easy virtue. We cannot wait for the change we know must come if we are to have around us in our lifetimes the things that are good, true and beautiful. Yet as we do not make problems quickly, we cannot solve them quickly. Not these problems. They are too big, too complicated, too involved, too full of human equations, too ramified with unknowns for quick solutions.

But we can *start*. First of all we need to look at the foreseeable future, an exercise we seldom undertake except

as dreamers. But we must be realists, not dreamers; as hard-headed as any businessman, as logical as a mathematician, as analytical as an engineer, as objective as a scientist. We need to ask: what today portends different conditions in five years, or in 10? What could these lead to in 20 years? How would these conditions react on people? How might people react to them? What difference in city environment, or in neighborhood surroundings, or in individual buildings, could be designed—not necessarily today, but in five, 10 or 20 years—to meet those conditions? How can we consciously and with vision shape our environment-to-be? Men in other fields look ahead and act as forces in sociology, technology, science, politics. Why should architects not apply their own special capacities toward the physical environment of the future? If just one aspect of urban living were thoroughly and seriously probed and its conditions today analyzed in terms of the directions which they indicate so that realistic forecasts could be made—not the post-war idle fancies which were like puffs of wind—we should have made a start toward the kind of city we, and our fellow men, would seek out because it was *good* to be in it.

To make our modern cities live up to the promise that cities have held out to man for thousands of years we need to assess what goes on about us, not only in terms of our here-and-now but in terms of what-it-will-be in five years, 10 years, 20 years. Such a change of perspective is overdue. But it is not impossible to apply.

Elisabeth Kendall Thompson

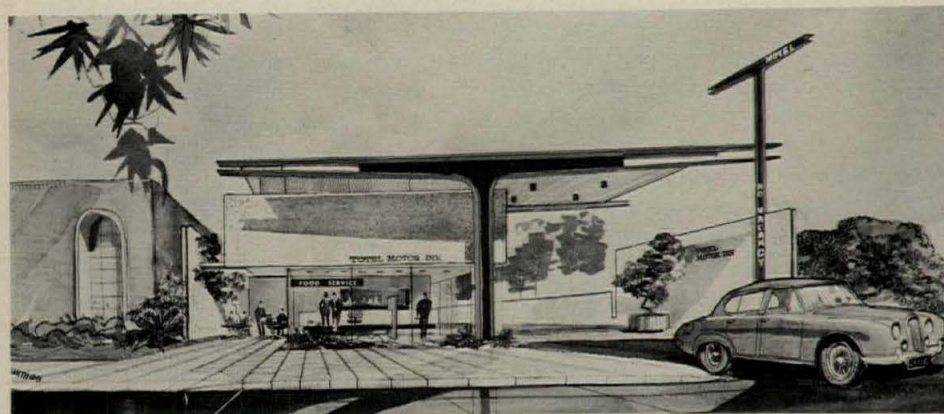
THIS MONTH'S WESTERN REPORTS:

Buildings in the News	32-2
Western Mountain Region honors nine for design	32-4
Parking structures for the West's two busiest airports	32-5
Western Topics	32-5
Western Events	32-5
Western Construction Trends	32-9
Estimator's Guide:	
San Francisco Bay Area	32-10
IBM Aerospace Headquarters, Los Angeles	124
Wood Lake, San Mateo	164



The oceanography building at the University of Washington, Seattle is the first unit in the new Marine Science complex. Built on the shore of Portage Bay, a fresh-water lake accessible by locks from Puget Sound, on land recently acquired by the University, the build-

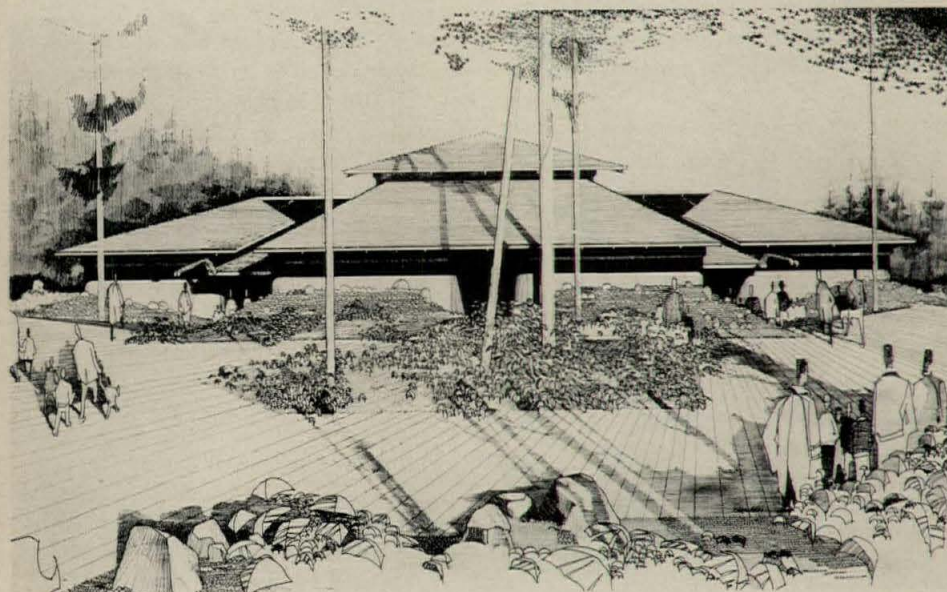
ing is far enough removed from other campus buildings to permit the architects freedom of design expression. Primarily a research laboratory, it will also provide staging facilities for research ships. Construction on this unit is under way. Architects: Liddle & Jones.



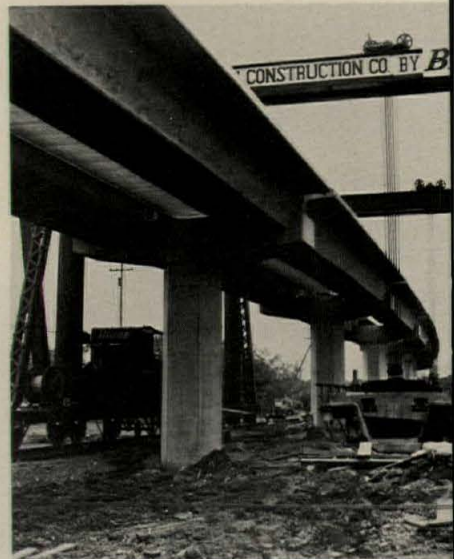
The first 22 of 100 "Totels" to be built next year will be under construction early next year in Southern California. A distinctive design using black and orange steel-T-beams to form umbrella roofs will be used to identify the national chain of motels. The buildings

are to be two stories in height, and will incorporate a restaurant with micro-wave food preparation units for fast service. Interiors and custom furnishings are being designed by the architects. Architects: Bodrell Joer'dan Smith & Associates.

Julius Shulman

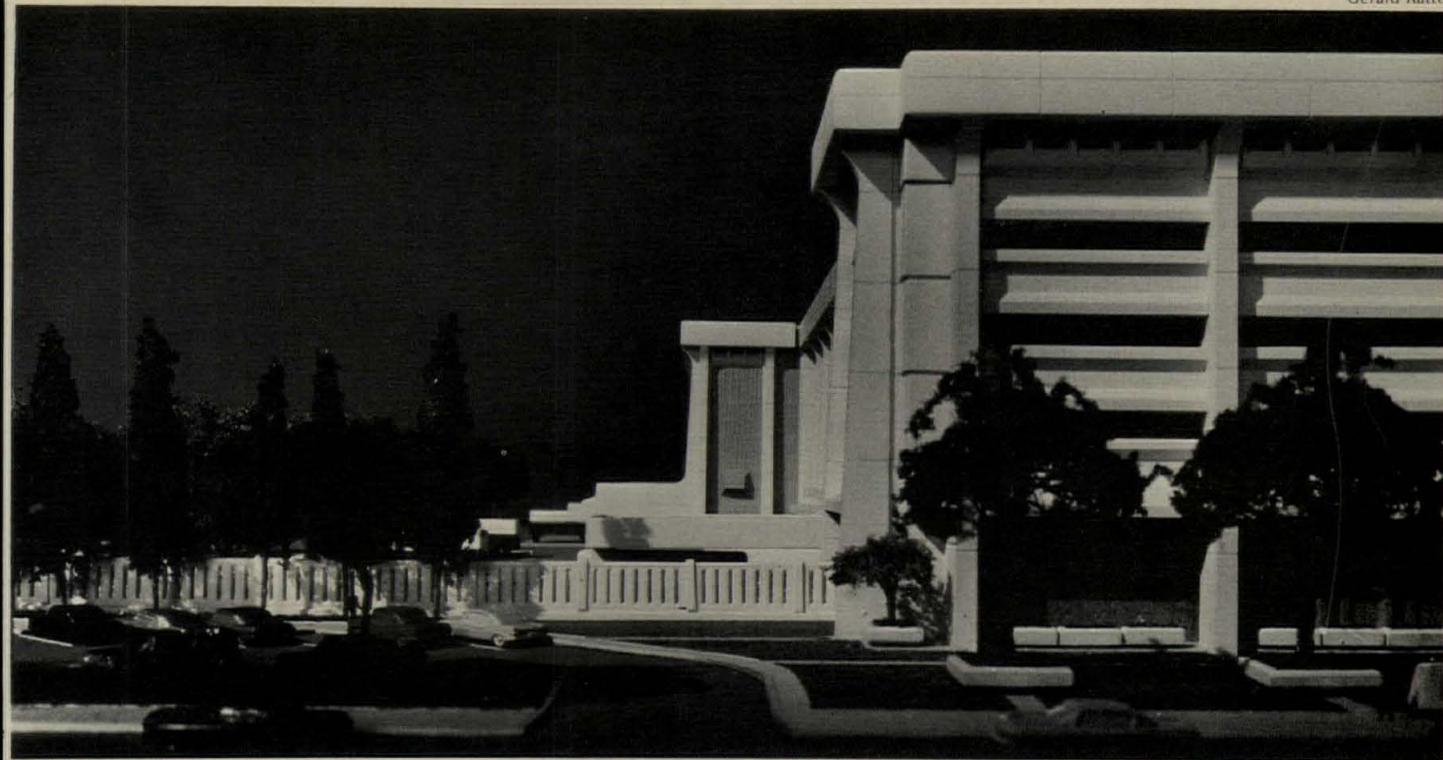


WESTERN BUILDINGS IN THE NEWS



The first aerial structure for the San Francisco Bay Area's Rapid Transit System has been completed and the full-scale model of the final design for the car has been on public display in various sections of the area. The aerial structure, designed by Donn Emmons consulting architect on the project, is a prototype of all the above-ground lines in the system. The system will combine above-ground and subway lines on land, and will run in a tube under the Bay.

The snake house at Woodland Zoo in Seattle—its formal name is the Reptile Grotto—is to be replaced by this handsome structure. Its design entailed providing for special requirements of temperature and humidity, and ultra-violet radiation. To increase heat retention further, granite river rocks are piled against the lower walls of the reptile pits which are lined at sides and bottom with foam insulation and plastic film. Exterior walls are sprayed with concrete and deep raked for texture. The structure is concrete columns with concrete block bearing walls. Roofs are framed with wood beams in radial arrangement and the finish is wood shingles. The central area, higher than the surrounding display areas, houses attic and basement spaces for mechanical equipment (and storage) and, on the main floor, a central core of display cases and food preparation facilities. Architects: Fred Bassetti & Company.



"The most modern post office in the world" is the description of the proposed new post office, the main mail distribution center for trans-Pacific postal services and 58 northern California post offices, at Oakland, California.

Construction is going to start on the \$20-million structure next year, and it is to be completed by the end of 1967. The new building will consolidate operations now carried out in seven buildings. The site is midway

between two earthquake faults, and the large tapered columns on the exterior directly reflect shear-resisting elements designed to resist earthquake forces. Architects: Stone, Marraccini and Patterson.

This learning center and library for the University of Utah in Salt Lake City, now under construction, houses more than books: recordings, films, teaching machines, and other types of communication media are provided for in the building's design. The building is square, approached by bridges which span planted areas and provide access at the building's third level. A central atrium at this level is roofed with a skylight which daylights the upper level reading and stack areas. Architects: Lorenze S. Young & Partners, Robert A. Fowler, J. Shirl Cornwall.

QA Architectural Arts



The largest bus terminal in the West, a \$10-million structure to be used jointly by Western Greyhound Bus Lines and the Southern California Rapid Transit District, got under way in Los Angeles early in November. Situated within walking distance of the central business district and accessible for free-

ways, the terminal will provide a central transportation facility which the city has never had. A great concourse for Greyhound buses will be located on the second of the terminal's three levels, a pedestrian concourse on ground level and a concourse for R.T.D. buses on the lower level. To take care

of the load of automobile parking on the roof and bus traffic on the second level, the structural system uses one six-foot-deep beam in each bay as the roof span girder for the roof, and the second level is suspended on tension columns from this. Architects: Welton Becket and Associates.

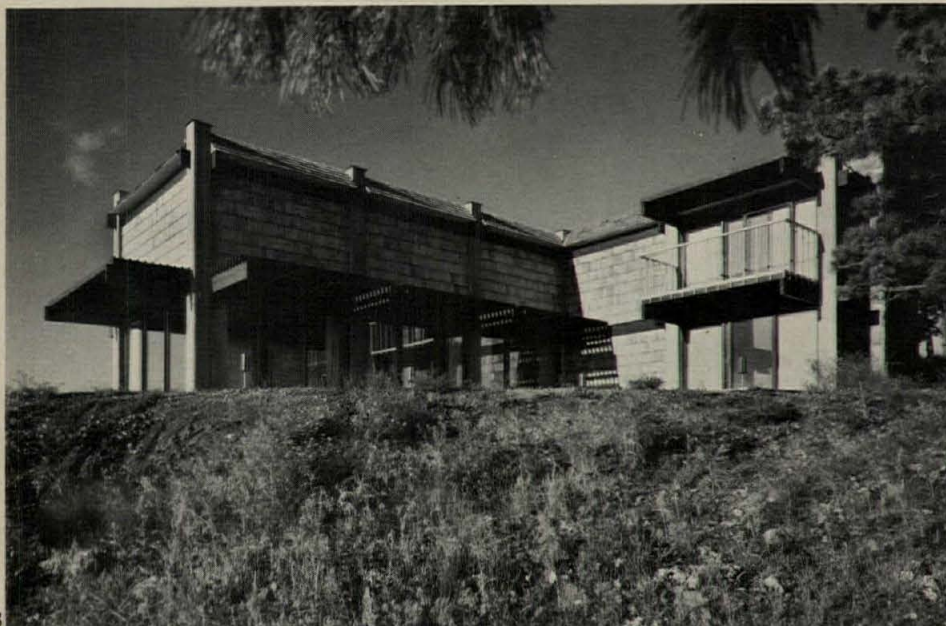


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Milmoë



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Western Mountain Region honors nine for design

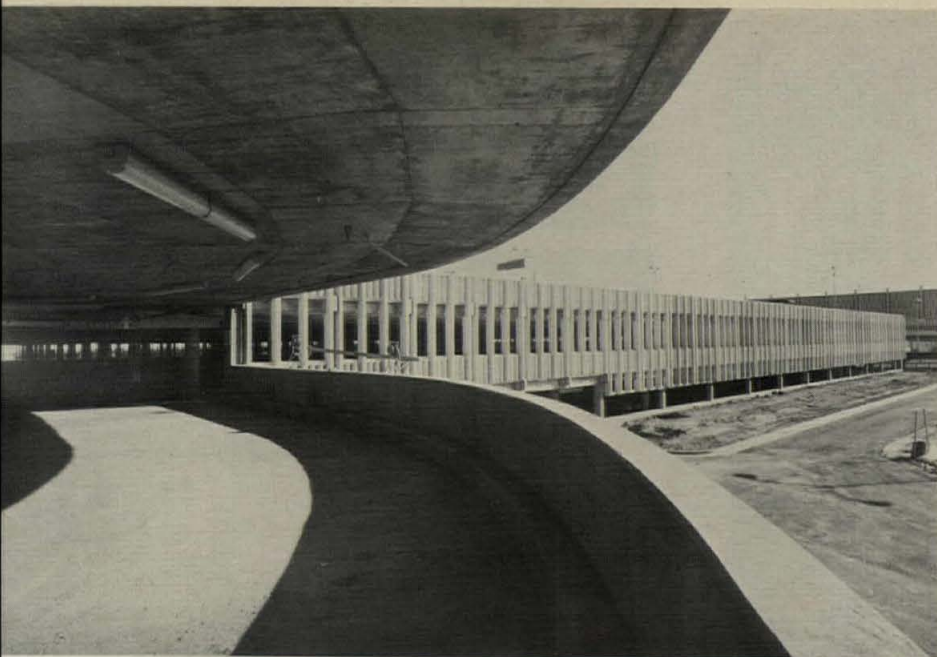
Nine firms in two of the six states that make up the A.I.A.'s Western Mountain Region received awards for design in the region's honors program, held this year at Phoenix, Arizona during the annual conference. The jury — George Kassabaum of St. Louis, chairman, Sam Zisman of San Antonio, Thomas Creighton and Robert Royston of San Francisco, Charles A. Blessing of Detroit and August Hecksher of New York — indicated that it was impressed with the restraint in use of materials evident not only in the winning buildings' design but in other entries as well, but that it was concerned that "the problem of the spaces between buildings and the relationship of an architect's project to surrounding buildings and spaces" still seemed, in many instances, unresolved. Like an increasing number of juries, it deplored the lack of time for actually visiting entries, and urged that some means be found to permit experience of buildings, particularly since, Chairman Kassabaum said, "it was necessary to make many assumptions as to why architects did what they did."

The winners: Additions and remodeling, Colorado National Bank, Denver, Rogers/Nagel, architects (*photo 1*); First National Bank of Loveland, Colorado, W. C. Muchow and Associates, architects (*photo 2*); Residence for the Drs. David and Irmagard Dobrow, Golden, Colorado, Donald R. Roark, architect (*photo 3*); Fire station and training tower, Tucson, Arizona, Cain, Nelson and Wares, architects (*photo 4*); Office building, Boulder, Colorado, Roger J. Easton, architect; Residence for Mr. and Mrs. Jerry R. Ditto, Castle Rock, Colorado, James T. Ream, architect; Boulder Country Club, Boulder, Colorado, Hobart D. Wagener, architect; Marcus Whiffen residence, Phoenix, Arizona, Calvin Straub, architect; Central Park West Complex, Phoenix, Arizona, Defiel and Miller, architects.

Bill Sears



4



Parking structures for the West's two busiest airports

San Francisco's new airport parking garage is a four-level structure with space for 2,700 cars. Each of its floors has an area of 290,000 square feet. But this is only phase one of the garage: two more phases will add enough space to park 8,000 cars — the largest such facility in the world. The present structure, built at a cost of \$9.5 million, connects with both new and old wings of the terminal by means of moving sidewalks and bridges over the existing ground level road. The building rises only 22 feet above ground since one of its levels is below grade. Precast concrete grilles screen cars during daylight, and at night filter a pattern of light. Architect: Edward B. Page; structural engineers: Henry Degenkolb & Assocs.

Los Angeles' just-completed airport parking garage—its first such structure—is a 32-foot high, three-and-a-half level building which adds 730 parking stalls to the airport's existing 8,000 spaces in open lots. The \$1,138,399 structure, located in the center of World Way, the airport's main street, is of prestressed concrete. Its sloping floors preclude the need for ramps between floors. A similar structure is now under construction and will add 679 cars, and a third will get under way upon completion of the second. The airport expects to serve an ultimate 30- to 35-million passengers. Architects: Paul R. Williams; structural engineers: T. Y. Lin and Associates.

WESTERN TOPICS

Names in the news

Architect **William Wilson Wurster** received his Achievement Award of the Building Industry Conference Board of San Francisco at its annual awards banquet. Structural Engineer **Howard Schirmer** and contractor **W. C. Tait** were also honored with the Honor Award and a Merit Award, respectively. The citation to Mr. Wurster was for "outstanding contributions to the construction industry and for distinguished service to the community." **Casper Hegner**, until 1962 a Denver architect, has been appointed Commissioner of Public Buildings, the first architect to head this federal agency in many years. **Dr. Ira Miles Robinson**, city planner and a senior staff member of the Arthur D. Little, Inc. San Francisco office, will head the Graduate Program in City and Regional Planning at the University of Southern California. Donald Harduson has been elected president of the California Council,

A.I.A. for 1966. **Cabell Gwathmey** has been nominated regional director from California on the national A.I.A. board.

State colleges can use private architects

California State College buildings can be designed by private architects, a District Court of Appeals has ruled. The decision upheld an earlier ruling by the Superior Court. Whether the California State Employees Association, which had brought the suit, will take the case to the State Supreme Court had not been announced at press time.

Sixty private architectural firms have been retained by the trustees of the state colleges to design buildings or to serve as consultants in the planning of new campuses. The suit was directed at them. The appellate court also ruled that the trustees could engage private architects without going through civil service procedures to establish that a state agency could not perform the services required.

WESTERN EVENTS

JANUARY

21 Winter Conference and architectural exhibition, California Elementary School Administrators' Association. Goodman's, 10 Jack London Square, Oakland, Calif.

27-29 Annual Convention, California Council of Civil Engineers and Land Surveyors. Hilton Hotel, San Francisco.

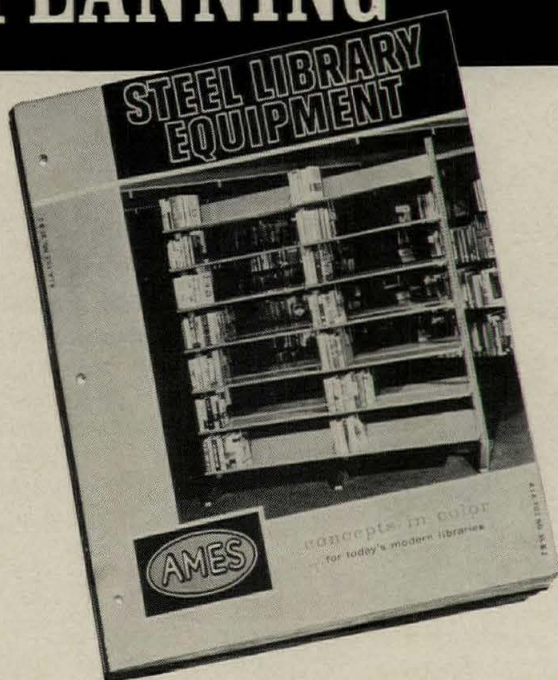
30 Closing date, "Sculptures by David Smith," Los Angeles Museum of Art, Los Angeles.

FEBRUARY

12 "Arts and Architecture. A Symposium," sponsored by the Coast Valleys Chapter, A.I.A., and San Jose State College, San Jose, California.

15-19 Waste Disposal Symposium, sponsored by the Atomic Energy Commission, Richland, Washington. Further information from A.E.C. Operations Office, Richland.

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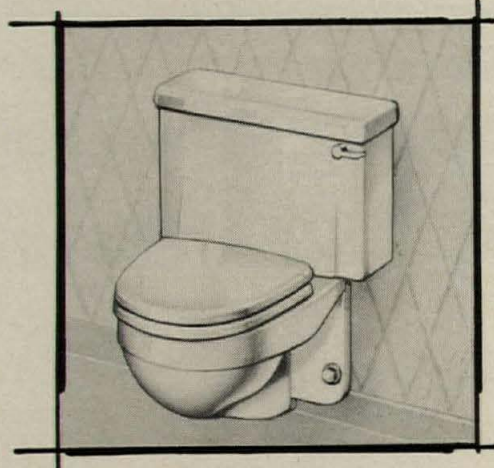
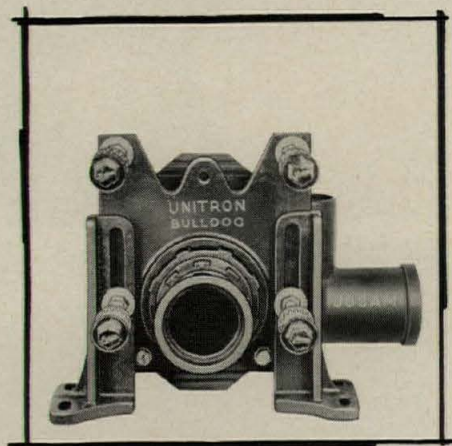
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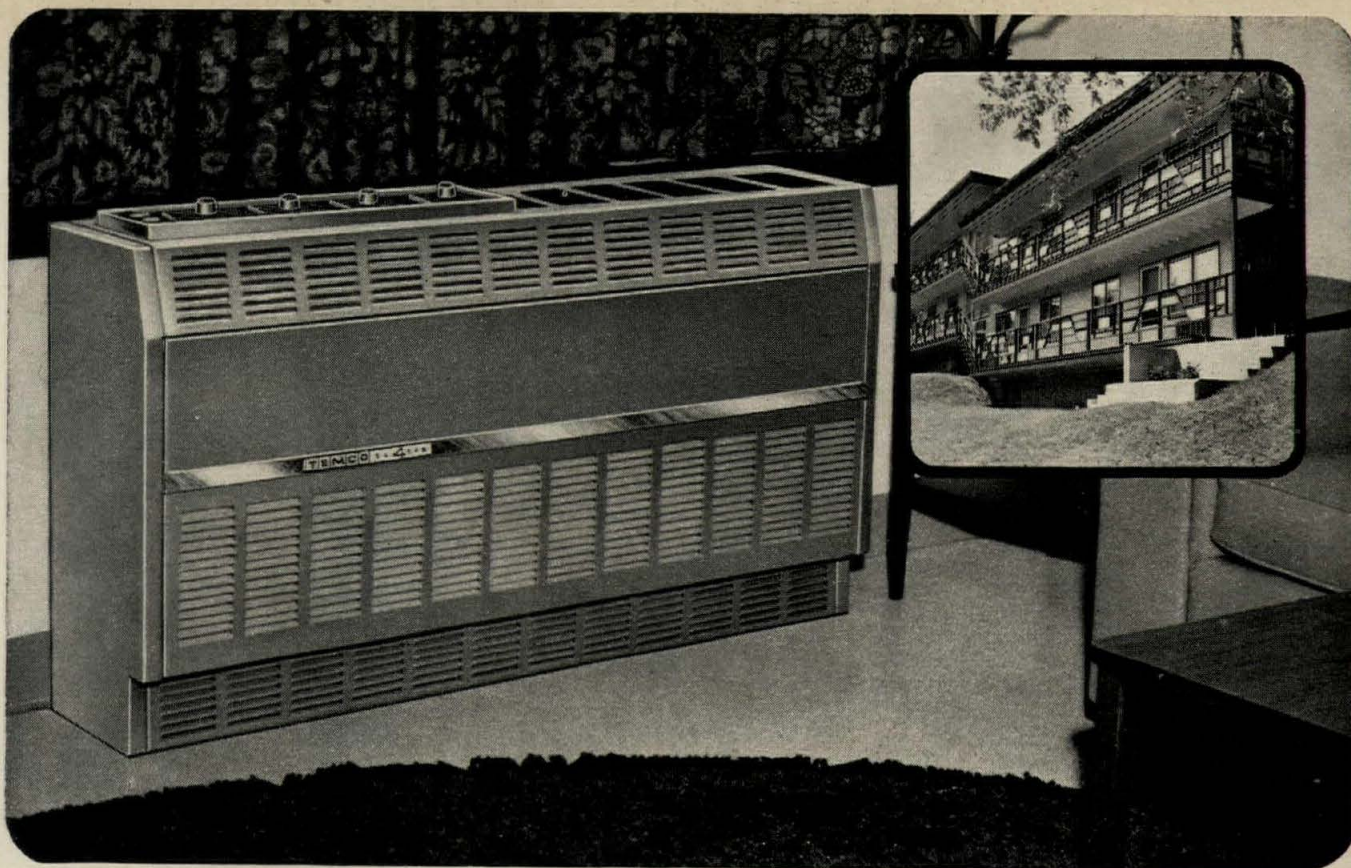
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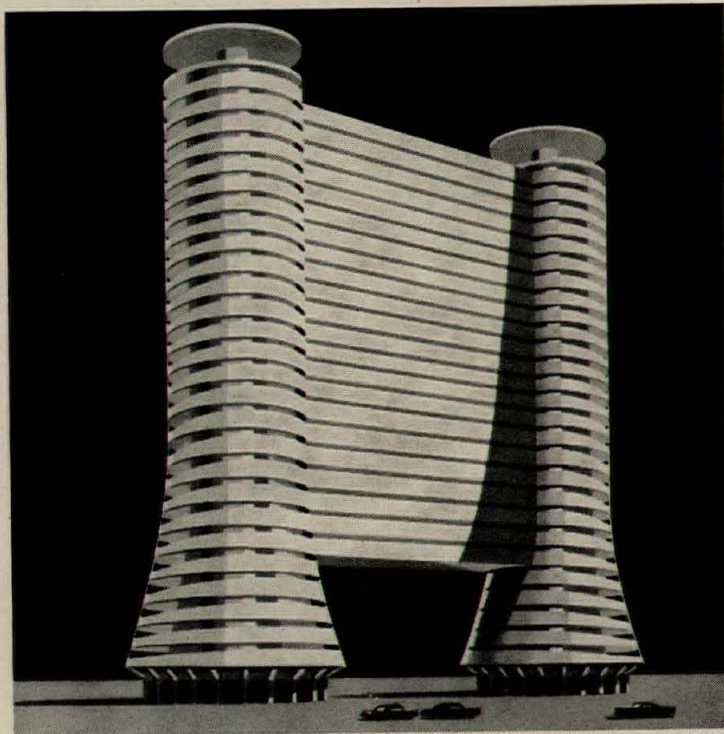
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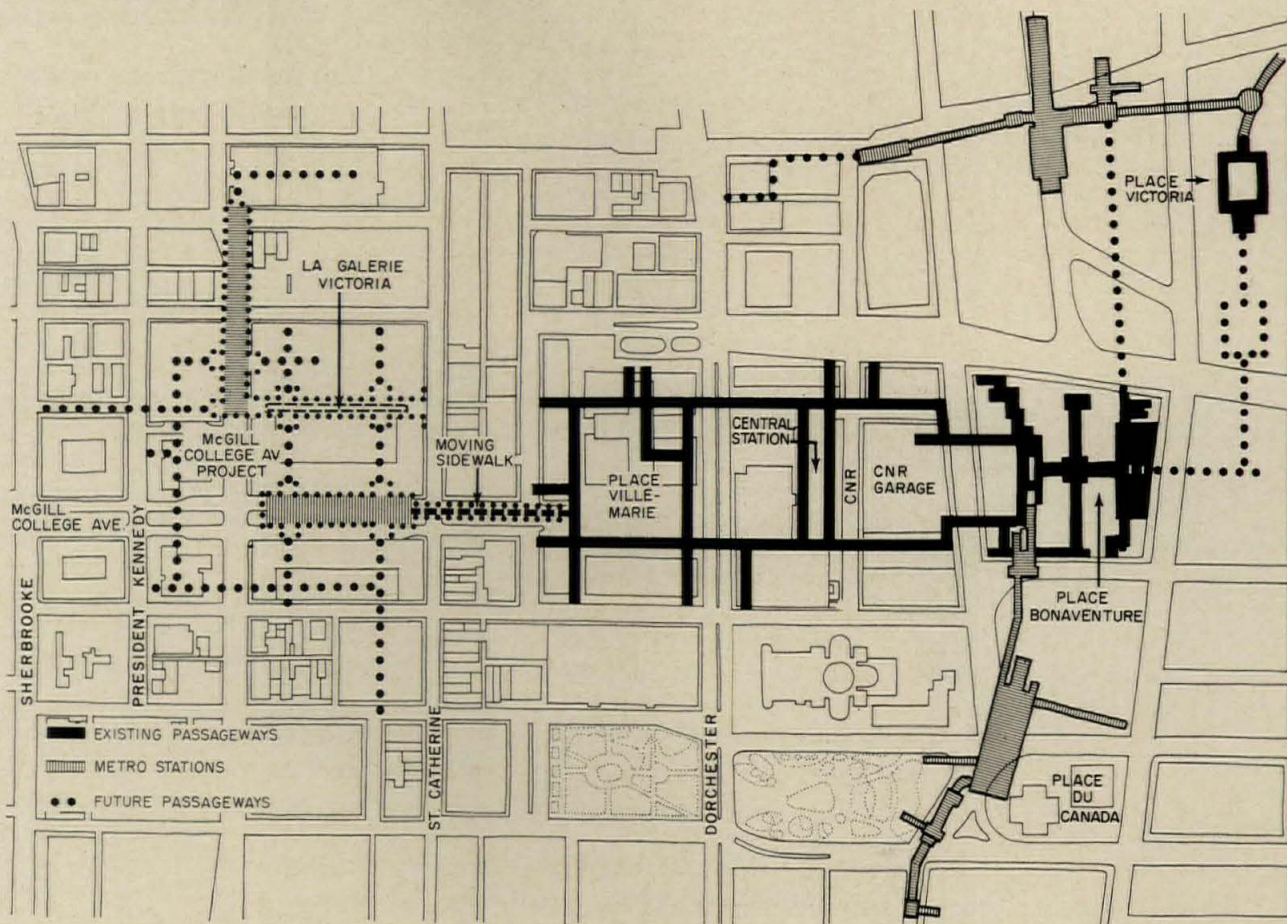


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For further information on communications planning,
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and Sweet's Industrial Construction File 19f/Be.

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Underground network is creating all-weather link for Montreal's booming new center city

Montreal is the hub of an extraordinary boom in both public and private building, which is being constantly accelerated by the approach of Expo '67. The map above details the extraordinary network of underground pedestrian shopping arcades which will link all of the important new building complexes with each other and with the subway.

The scheme was conceived by Vincent Ponte and Henry N. Cobb of I. M.

Pei & Associates, at the time the firm was planning and designing the Place Ville-Marie complex. First step was an underground shopping arcade linking their new building with the railway station.

With this start, other new buildings in the downtown complex are being integrated with the underground network and the new subway system. Tied in are Place Bonaventure, designed by Affleck, Desbarats, Dimakopolous, Le-

bensold & Sise; Place Victoria, designed by Pier Luigi Nervi and Luigi Moretti; Place du Canada, Canadian Pacific's \$33 million hotel-office building; and the new McGill College Avenue project planned by I. M. Pei Associates with Ponte, now an independent consultant.

The underground network will serve not only to relieve congestion and crowding on the surface, but provide extra rental space for the building owners.

A.I.A. board proposes vote on 40% bigger headquarters

At its winter meeting, the Board of Directors of the American Institute of Architects voted unanimously to seek approval of the membership at the convention next year to purchase the adjoining Lemon Building to enlarge the site for the new A.I.A. headquarters building. Mitchell/Giurgola Associates, which won the competition for the building last year, has developed several

ways in which an enlarged site could be used to expand facilities. Acquisition

THE RECORD REPORTS ON:	
Office and retail complex has parking for 1800	72
Oregon dormitory looks inward on courtyard	268
Architectural League honors 24 in Gold Medal Competition	272
Michigan bank has heliport on roof	280

of the Lemon Building site would add 11,000 square feet to the 28,000 square feet that the Institute presently owns, and make possible a building of about 130,000 square feet (some 40 per cent larger than a building suited to the original site). This program, says the board, "seems desirable at this point."

In other business at the winter meeting, the board adopted two documents — one being "Recommendations for Establishing the American Arbitration Association as Administrator of Con-

struction Industry Arbitration," and the other being a guide to "Professional Collaboration in Environmental Design," subject to approval of the participating organizations. The board also named a task force to oversee its "War on Community Ugliness." The task force is composed of Willis Mills, chairman; George Rockrise; Kenneth W. Brooks; and Richard W. Snibbe. Finally, the board authorized the exploration of programs for educating the general public to understand the difference between good environmental design and inferior design. As part of this effort, the A.I.A. Committee on Esthetics will investigate the possibility of granting fellowships in architectural journalism.



The glory that once was... will be again?

A unique sculpture garden (now lying in a heap behind the museum) composed of architectural ornament from demolished buildings, will open this spring at the Brooklyn Museum in New York. The objects have been collected and donated by an organization called the Anonymous Arts Recovery Society. Ivan Karp, New York art dealer and writer who heads the society, explains that they are salvaging circa-1880-1910 architectural ornament in New York City and other areas. They are mainly interested in saving pieces which have "a perverse Victorian quality not related to European ornament because of their distortions and eccentric quality — mainly portrait heads and monumental pieces." According to Mr. Karp, there are over 100 dues-paying members, although only eight or ten do the physical work, and only three or four are constantly involved. Among the Society's current projects are negotiations to obtain four monumental capitals and a figure that supported a clock (all lying in a dump in New Jersey) from McKim, Mead & White's late Pennsylvania station. The sculpture garden was designed by Ian M. White, assistant director of the museum.

Private industry rehabilitates tenements in New York City

The United States Gypsum Company has undertaken a program of rehabilitating basically sound, but greatly deteriorated, apartment buildings. The company gave two reasons for instituting this program: it feels that rehabilitation can become as important to the nation's economy as new construction, and that rehabilitation represents a vast market for building industry products.

The initial phase of the program began with a six-story building at 307-09 East 102nd Street in New York City. The United States Gypsum Company paid \$30,000 for the building and has spent \$162,000 in its renovation. Architects were Mazza & Seccia and contractor was the Blitman Construction Company. Cooperating city agencies were the Rent and Rehabilitation Administration, the Housing and Redevelopment Board, and the Department of Water, Gas and Electricity. Federal agencies were the Department of Housing and Urban Development and the Federal Housing Administration. The company will continue its program by rehabilitating more structures on the same block. The company hopes to show that private industry can undertake the rebuilding of "middle-age communities" all over the country.

Arts quota in buildings is established in New York City

An executive order directing that an art quota be set for applicable city buildings has been signed by New York City Mayor Robert F. Wagner. The Mayor's order provides that between one-half of one per cent and one per cent of total construction costs be allocated to sculpture, murals, stained glass, special landscaping, and other arts. Not included in the order are buildings such as sewage disposal plants. A similar quota, which provides for one per cent for art, has been in effect in Philadelphia for six years.

Supporting the order were the following organizations: The Architectural League of New York; the New York Chapter of the American Institute of Architects; the New York Chapter of the American Society of Landscape Architects; the National Society of Mural Painters; the Sculptors Guild; the Fine Arts Federation; the Harlem Cultural Council; the Municipal Art Society; the International Association of Art; the National Institute for Architectural Education; the National Council of the Arts and Government; and the New York Board of Trade.



Balconies with no windows — in Russia a rule is a rule

These new flats in Moscow followed bureaucratic instructions to the letter—with the accompanying result. Officials said: "This is not a mistake; the Fire Brigade would not let us leave in the windows and doors. The wall of this house faces the October Cinema, and doors and windows in it would create a fire hazard." *Krokodil*, the Soviet satirical weekly, satirically points out that "there has been no wastefulness or misconstruction here. We suggest the house be included in the Moscow tourist attractions."

Thompson leaves TAC to open his own office

Benjamin Thompson, chairman of the Department of Architecture at the Harvard Graduate School of Design and one of the founding partners of The Architects Collaborative, Cambridge, Massachusetts, has left TAC and on January 1 opened his own office in Cambridge.

The heavy demands of teaching and administration in his Harvard post, which he has held since 1963, were responsible for his move, Mr. Thompson said.

Mr. Thompson was one of eight founding partners of TAC, the renowned firm which was established in 1946 to exemplify and develop Walter Gropius' ideal of collaboration in architectural practice. Robert McMillan now has his own practice in Rome, and Jean Bodman Fletcher died last year. The founding partners who continue are Professor Gropius, Norman Fletcher, John and Sarah Harkness and Louis A. McMillan.

Obituaries

Frederick H. Allen, San Francisco architect and planning consultant, and former member of the New York City firm of Harrison, Ballard & Todd, died on December 1, 1965. He was 56 years old.

Henry J. Grassold, vice-president and treasurer of the Milwaukee firm of Grassold, Johnson, Wagner and Isley, Inc. died November 29, 1965 at the age of 67.

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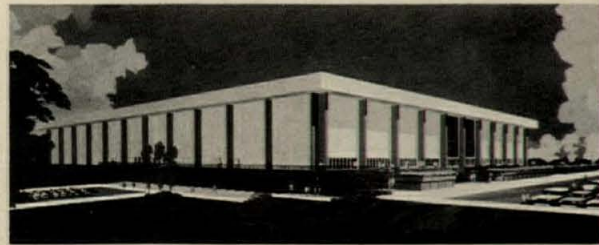
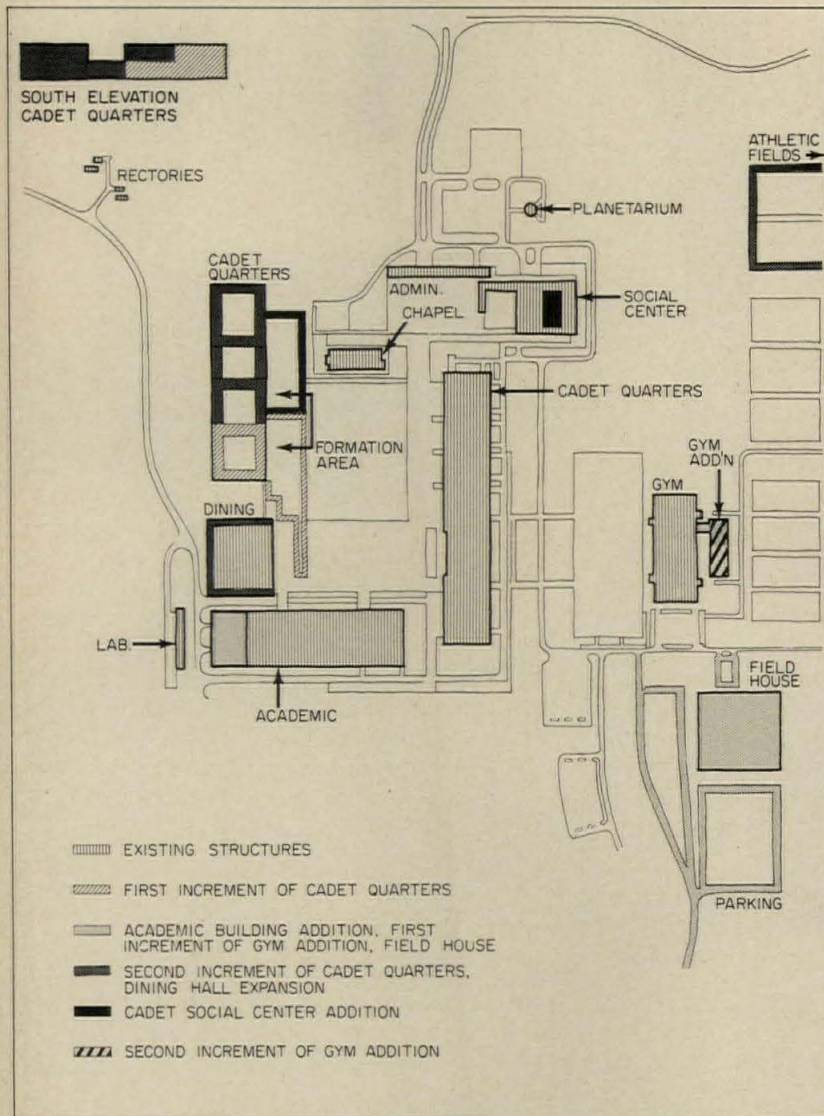
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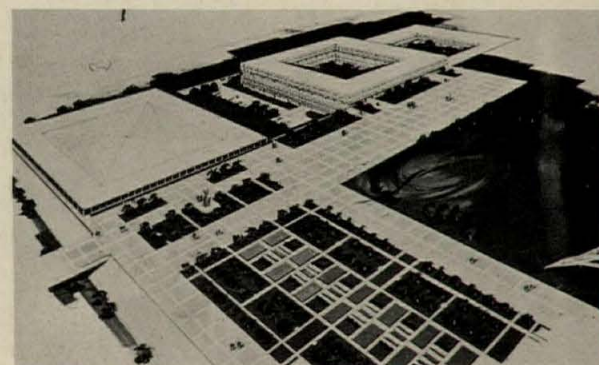
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New field house, which contains 217,450 square feet, provides basketball court with seating for 6,000, ice hockey rink, and high-bay multi-purpose indoor practice fields.



Three- and six-story quarters will be built in two increments of 307,500 square feet and 324,778 square feet, to provide a total of 832 two-man rooms.



Dining hall addition will alter (see also below, left) three elevations of the SOM design. Space is being added by pushing walls out to the edge of the 21-foot overhang.

Air Force Academy expansion involves not just additions, but alterations, to SOM's design

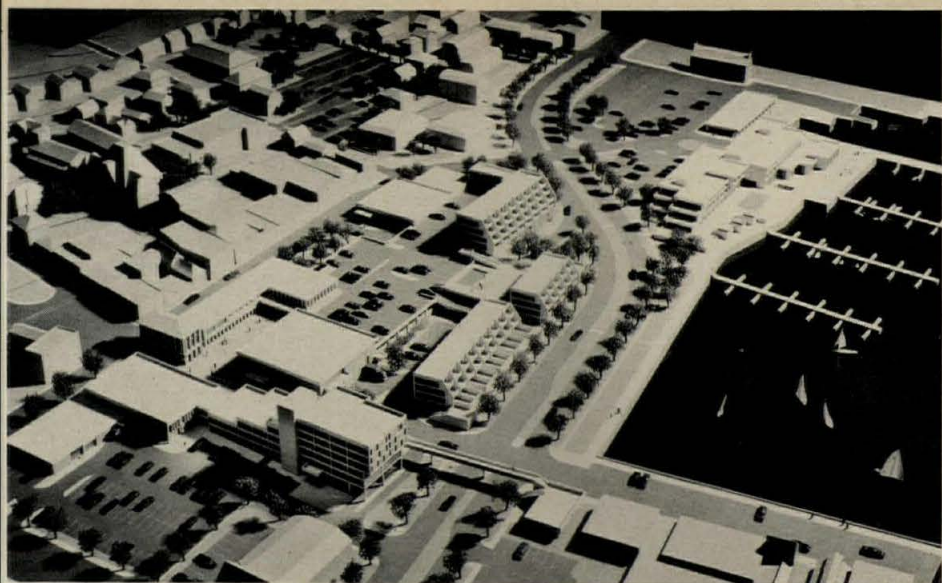


Dining hall, as SOM designed it.

Seven years after the first buildings of the Air Force Academy in Colorado Springs, were completed, a \$40-million expansion will add two new buildings and alter four buildings of the famous complex designed by Skidmore, Owings & Merrill. Most of the new construction is designed by a joint venture of the Omaha architectural and engineering firms of Henningson, Durham & Richardson and the Leo A. Daly Company. Designers of the new field house are Sverdrup & Parcel and Associates of St. Louis. The concept and preliminary design stages have been approved.

According to Air Force officials, the new architects were selected by "normal Department of Defense procedures." The expansion provides for an increase from 2,500 to 4,250 cadets.

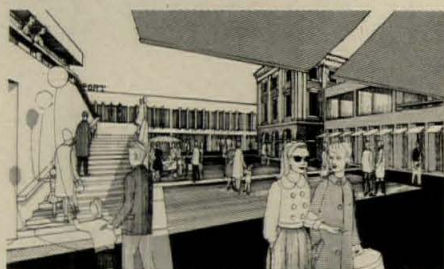
Included in the expansion, besides the structures shown on this page, are a 268,648-square-foot addition to the academic building; formation areas; the addition of a snack bar and lounge within the open court of the social center; new lockers and teaching facilities for the gym; an addition (not yet designed) to the hospital; and additional athletic fields, parking and utilities.



Renewal project respects the scale of historic surroundings

The \$6.5-million Long Wharf-Market Square urban renewal project in Newport, Rhode Island will transform a 22-acre site into a contemporary residential, recreational and commercial center, but will maintain the scale and character of its historic surroundings. The project is being developed by the Thames Street Company, a limited partnership in which the architecture is being provided by the firm of Hoberman and Wasserman, construction will be undertaken by the William L. Crow Construction Company, and the project management and administration will be under the direction

Along the waterfront are stepped residential units; at top right is motel-restaurant; at left and front left are commercial and office space surrounding 523-car garage.

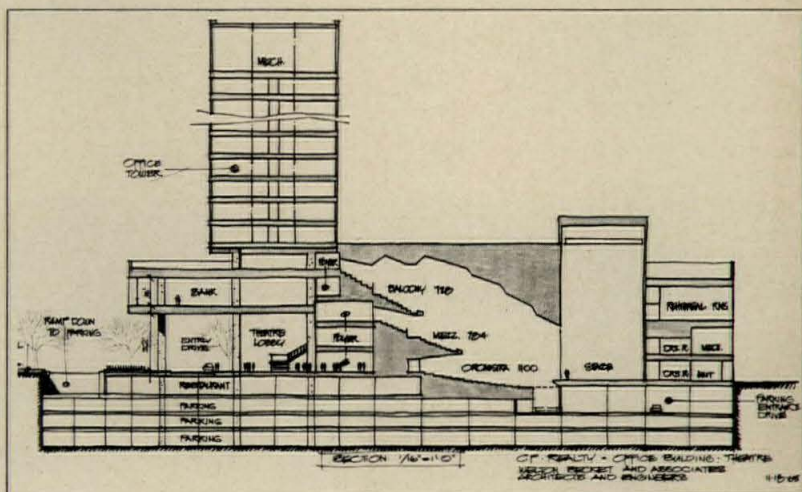


of the Corinthian Conservation Company, Inc. Included in the project will be a 108-unit motor inn; a marina with 88 slips; 100,000 square feet of commercial space; 50,000 square feet for offices; 60 apartments and townhouses; and parking areas.



Office building designed as "strong structural statement"

The design of the office building for area No. 12, Charles Center, Baltimore, chosen from among four entries in a developer's competition, was designed by architects Peterson and Brickbauer and Emery Roth & Sons as a "strong structural statement where the structural material [concrete] would also be the finishing material." Gilbane Building Company is development agent and contractor. The \$13-million, 22-story structure will contain 356,000 square feet of office space, 24,000 square feet of retail space in a two-story ground-level pavilion and underground parking.



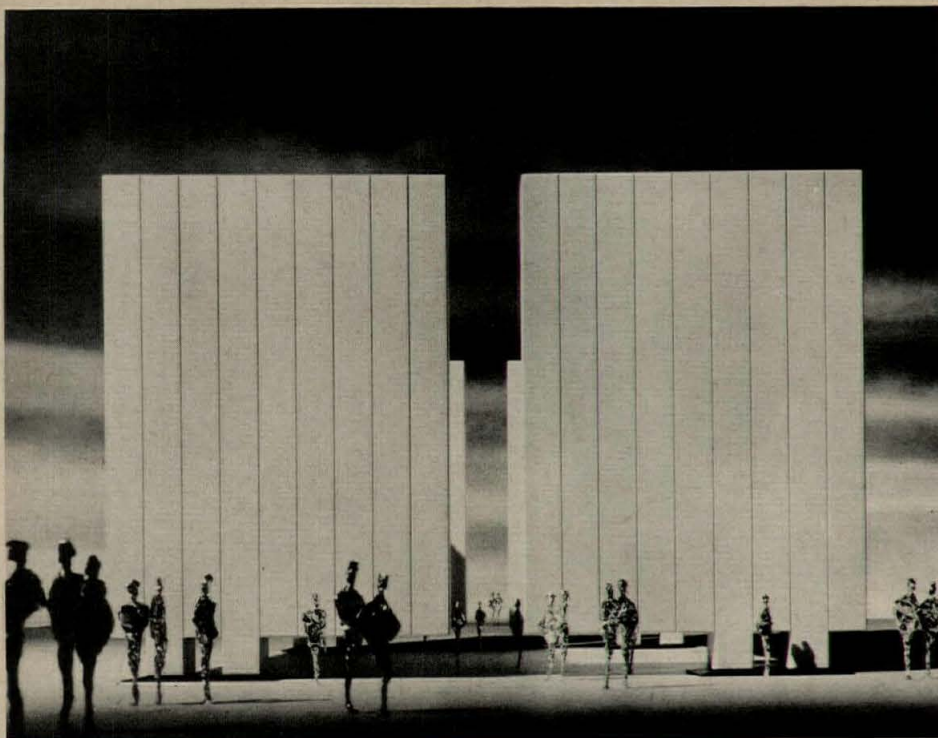
Building complex will integrate office and theater for maximum day-night use

A building complex in West Los Angeles designed by Welton Becket and Associates will integrate a 2,600-seat proscenium theater, a 24-story office building, a bank, two restaurants, and parking for 1,300 cars (on three levels beneath the

complex and in an adjoining parking structure). The lobby for the office building is separated from the lobby of the theater for functional division of traffic. A two-story bank will span the area above the office lobby, and there

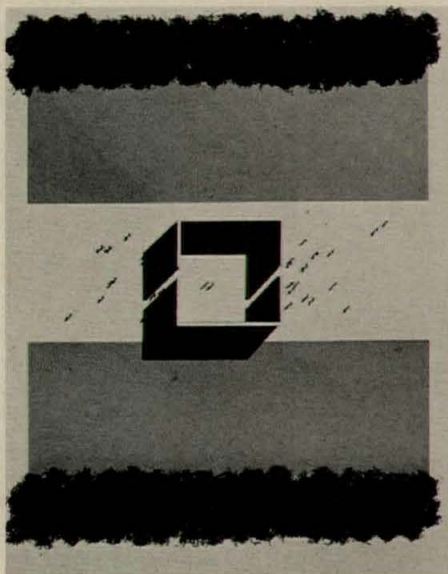
will be 350,000 square feet of office space. The theater will seat 1,100 continental style on the orchestra level, and 784 in a two-level mezzanine, and 728 in a two-level balcony. The seating can be condensed to 1,800.

Louis Checkman photos

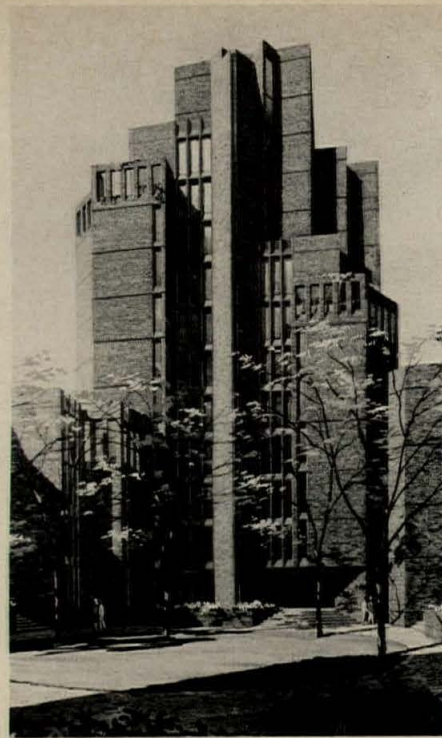
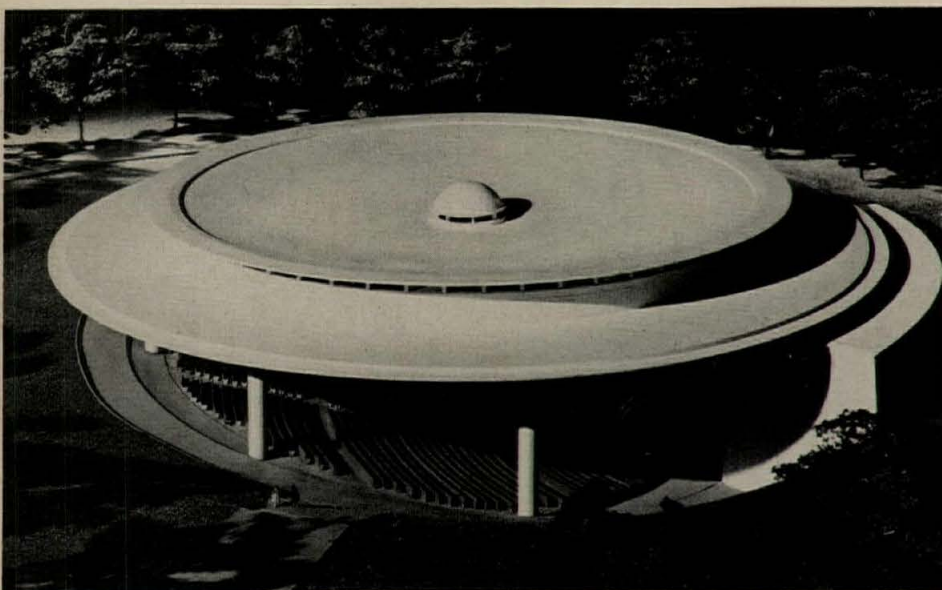


Kennedy memorial in Dallas "simple, modest and dignified"

The Kennedy Memorial in Dallas, designed by Philip Johnson, is 50 feet square and 30 feet high, with slits on two sides. The monument "floats" at table height, supported at the corners by slightly longer slabs of white precast concrete. Speaking of the memorial, Mr. Johnson said: "You can't see Dallas . . . you can't see anything but the sky. You are forced into an attitude of reverie." The monument, which will be located within a landscaped park a few blocks from the spot of President Kennedy's assassination, will cost \$100,000. Construction is expected to start in March. Mr. Johnson's design objective was to make it "simple, modest and dignified."



Louis Checkman

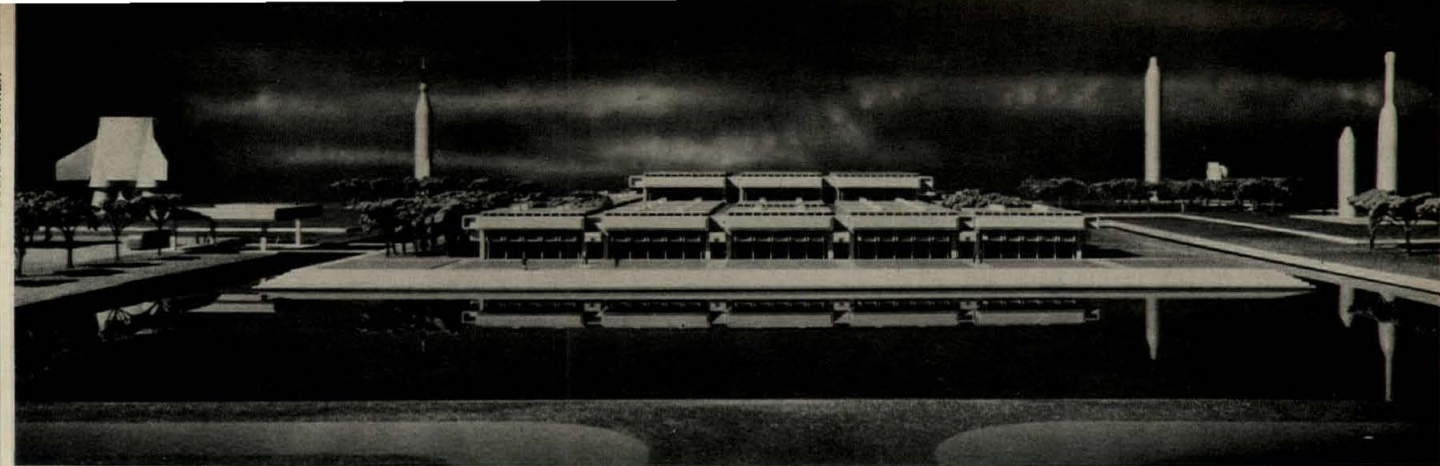


Tower will serve as center for university house plan

The first of five proposed house units for the University of Pennsylvania is a four-story rambling structure integrated with an 11-story tower in a C-shaped complex. The \$5-million project, designed by Kneedler, Mirick & Zantlinger, houses 209 residents, 40 commuters (as a campus base), and eight junior faculty members in the 80,000 square feet devoted to walk-up dormitories. The end four-story unit includes a large commons room, dining room and library. The brick-faced tower, containing 40,000 square feet, will house 96 residents, 20 commuters and four junior faculty members. Recreation areas are located below the entire complex.

Amphitheater seating 4800 has cable-suspended roof

A covered amphitheater set within a 43-acre park in Holmdel Township, New Jersey is the first phase of the Garden State Art Center designed by Edward Durrell Stone. The structure will be an open-air theater sheltered by a cable suspended roof. It will seat 4,800 under the roof, with up to 2,200 more accommodated on surrounding lawn. The theater is serviced by a 231-foot-wide central mall flanked by parking areas for 1,800 cars. The 200-foot-diameter roof is supported by eight equally spaced five and one-half foot in diameter hollow columns. The stage house is semi-circular and is 45 feet deep and 140 long with a 60-foot-long stage.

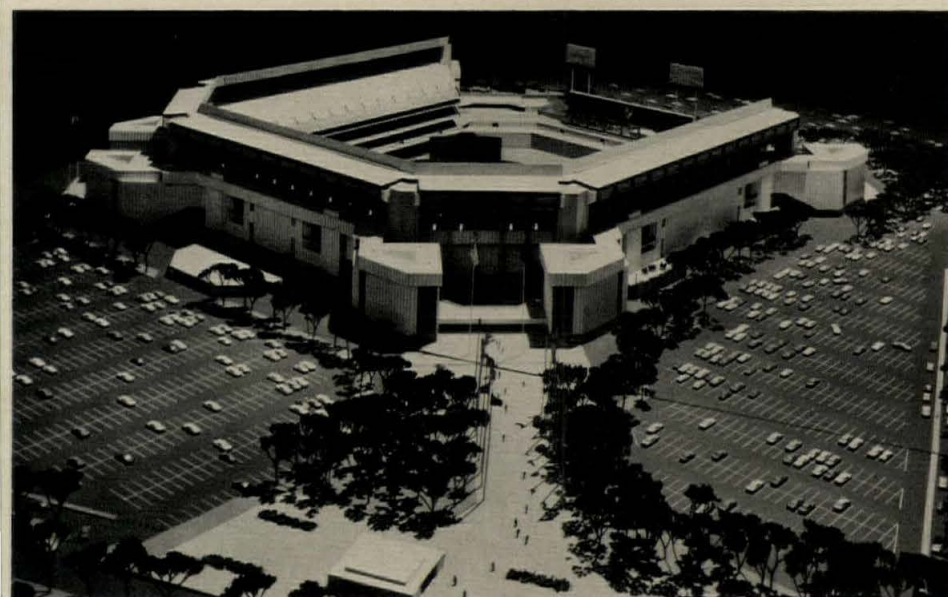


Visitor Information Center designed to give scale to "unrestrained environment" of Cape Kennedy

The competition-winning design, selected by the National Aeronautics and Space Administration for its Visitor Information Center at John F. Kennedy Space Center in Florida, is a series of 48-foot-square modular units set on a podium

within a huge reflecting pool. The initial phase of the scheme, which was designed by Welton Becket & Associates, will arrange eight modules around a central courtyard, providing a total of 20,000 square feet at a cost of \$1 mil-

lion. The interiors will have flexible exhibit spaces and will be air conditioned, with the pool serving as cooling agent. The structure will have reinforced, textured concrete columns and beams with an exposed waffle slab concrete ceiling.



Rectangular stadium will seat up to 72,599

The proposed \$25-million stadium in Philadelphia—a joint venture of George M. Ewing Company, architects and engineers, and Stonorov and Haws, architects and planners, and McCormick and Taylor Associates, consulting engineers—will be rectangular in shape because the architects feel it "permits a greater majority of seats to be located closer to the playing field than would be possible in any other shape for a multi-purpose stadium." The stadium will seat 60,570 for baseball and 72,599 for football with the addition of movable seats. Parking will be provided for approximately 10,000 cars, 300 buses and 150 taxi cabs. Foundation work will begin this year.

Air terminal incorporates parking within structure

The \$11-million Eastern Airlines passenger terminal at Logan International Airport in Boston, designed by Minoru Yamasaki, will provide parking for over 1,000 cars on three floors above the passenger lobby, and on the roof. The parking levels will be faced with a slotted curtain wall of aluminum strips and either glass or translucent plastic paneling. The terminal itself, exclusive of parking, will contain 125,000 square feet. Passengers will have to walk a maximum of 350 feet from the sidewalk or elevators to board a flight. Six gate positions will be provided from the main terminal, which will be flanked by satellite lounges with six gates each.



Balthazar

Building money more costly in 1966, but building activity should remain high

In spite of all the furor raised by the Federal Reserve Board's decision last month to raise the discount rate, the perspective of a few weeks' time has brought pretty general agreement on the appropriateness of that action.

In the potentially inflationary situation that the economy will be operating in — full employment with the added complication of the war in Viet Nam — it is highly probable that a larger part of next year's anticipated expansion would merely have taken the form of price increases. And under these conditions, it was just as appropriate for the Fed to attempt to counteract the tendency toward a runaway boom as it has been in the past for it to carry out a moderately expansive monetary policy to help stimulate economic growth.

In construction, just about everything that happens requires credit to make it happen. With many types of short and long term money costing more, which types of building activity are most likely to be affected?

Higher-cost borrowing may inhibit further growth in some areas of industrial and commercial building where financing costs are figured with a sharp pencil. But while some firms will undoubtedly cancel or trim their spending plans, the fact that demand is pushing hard on capacity will keep most industries expanding in line with their announced intentions. A survey of companies taken since the rate increase showed that fewer than 10 per cent intend to cut back their capital investment programs for next year because of higher interest costs.

Several types of institutional buildings—hospitals and higher educational facilities in particular—will be drawing increasing support from loans and grants through the many new Federal programs. As a result, these building types are not likely to be particularly sensitive to changes in market interest rates.

Housing is the biggest question mark. For the past year-and-a-half, the housing market has been one of the

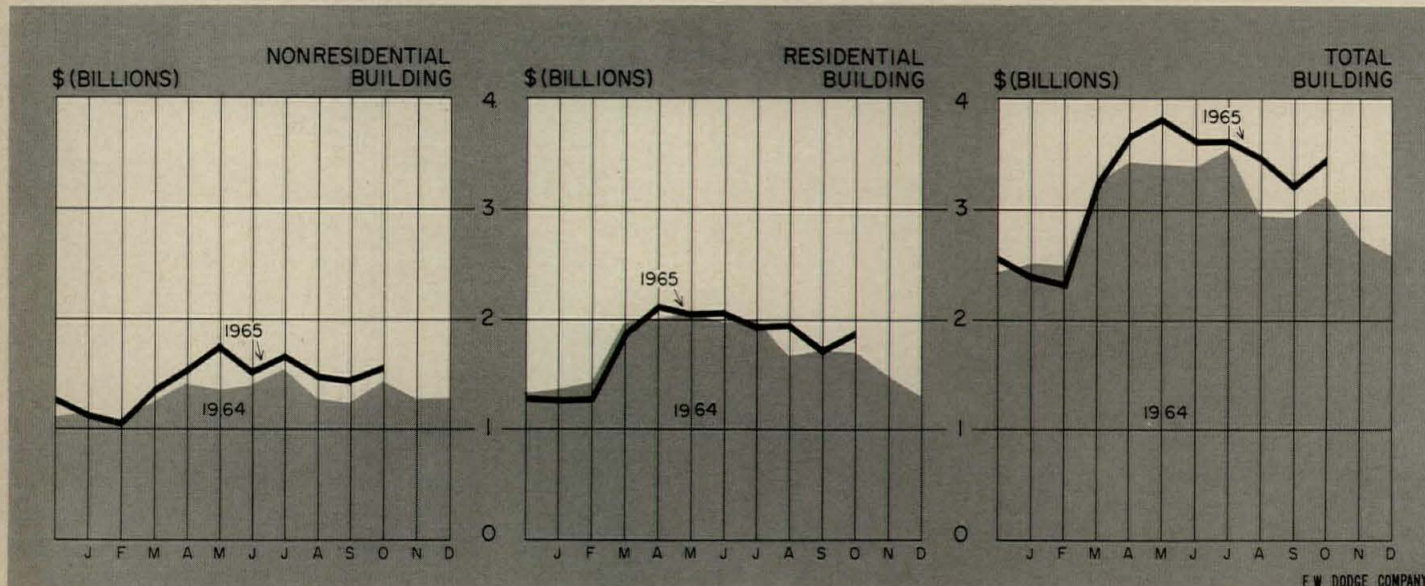
few weak spots in an otherwise vigorously expanding economy. And now, when the outlook for residential building is showing more promise, many fear that the prospect of higher mortgage rates may choke off the mild recovery that was anticipated.

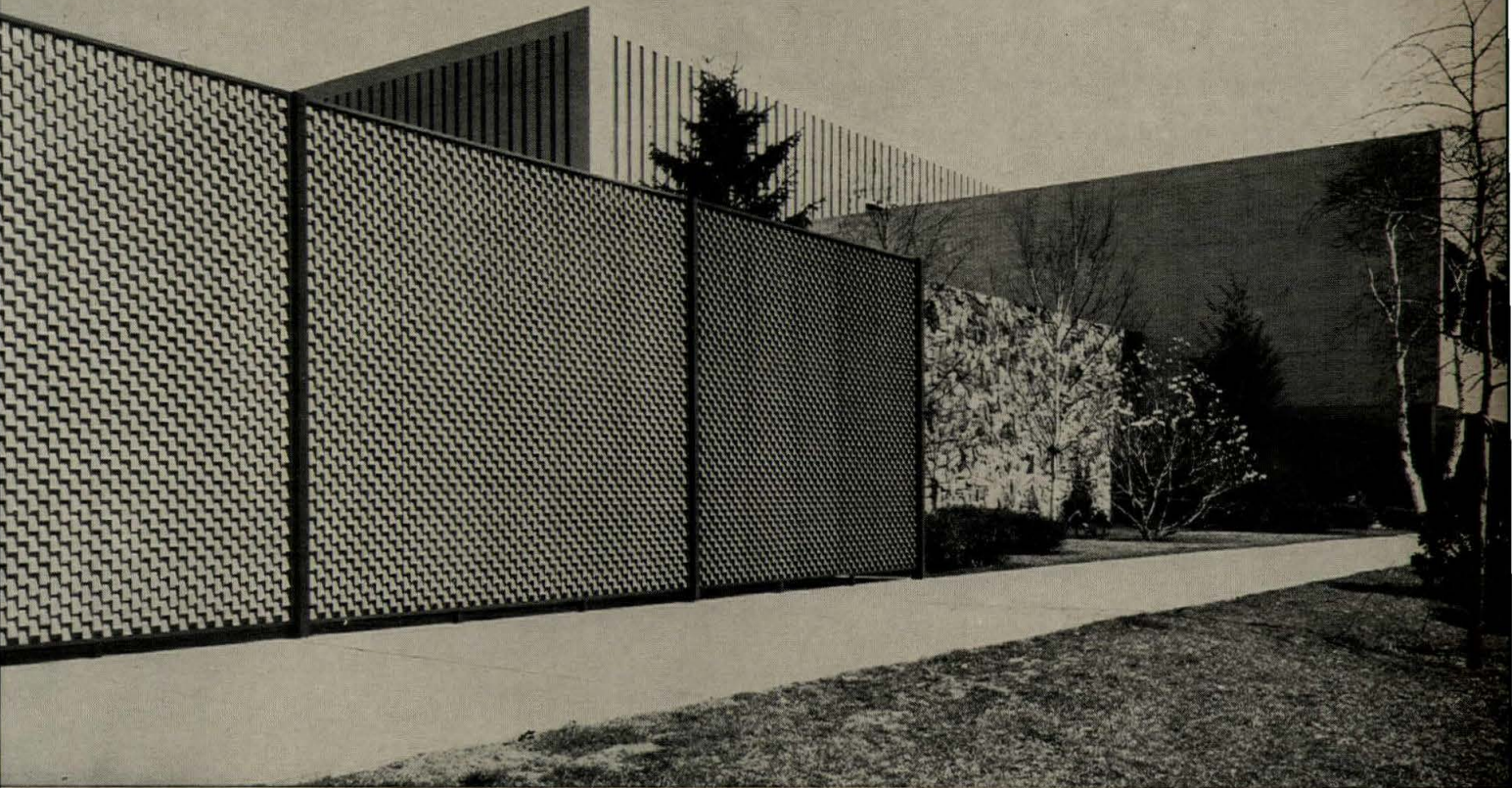
Mortgage money will cost more in 1966, and in fact, rates are already in the process of adjusting to the upward movement of the entire credit structure. This is not the same, however, as a restriction in the supply of mortgage funds.

Just a little over a year ago the Fed took a similar step. But while the previous increase in the discount rate brought the cost of credit up a notch, it was accompanied by a rising flow of available funds. There is every reason to expect that once again the Fed will maintain a growing supply of credit consistent with economic expansion and relative price stability. Mortgage money, like all funds, will continue to be available in 1966, though at a higher price. This should not serve to deter any but the marginal or speculative ventures.

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

Building activity: monthly contract tabulations





Architect: Abbott, Merkt & Co., New York City

BORDEN ARCHITECTURAL DECOR PANELS: DECA-GRID

Shown above: Custom-designed Borden Deca-Grid panels with tilted spacers, used to separate and screen the service area at Saks in Garden City, Long Island.

With the Deca-Grid style, specifications for spacings and spacer bar positions may be varied almost indefinitely. Another variation available for Deca-Grid is known as the Slant-Tab variation—here the spacers are mounted at angles of 30°, 45°, 60° or 90° and the spacers (called Slant-Tabs) may be altered in length, depending

on angle of mounting selected.

All the Borden Decor Panel styles, including Deca-Grid Deca-Grid, Deca-Grid, Deca-Ring and Decor-Plank, are highly versatile in design specification and in application such as for facades, dividers, grilles, fencing, refacing of existing buildings, etc. Fabricated in standard or custom designs in sturdy, lightweight aluminum, Borden Architectural Decor Panels provide a handsome, flexible, maintenance-free building component.

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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

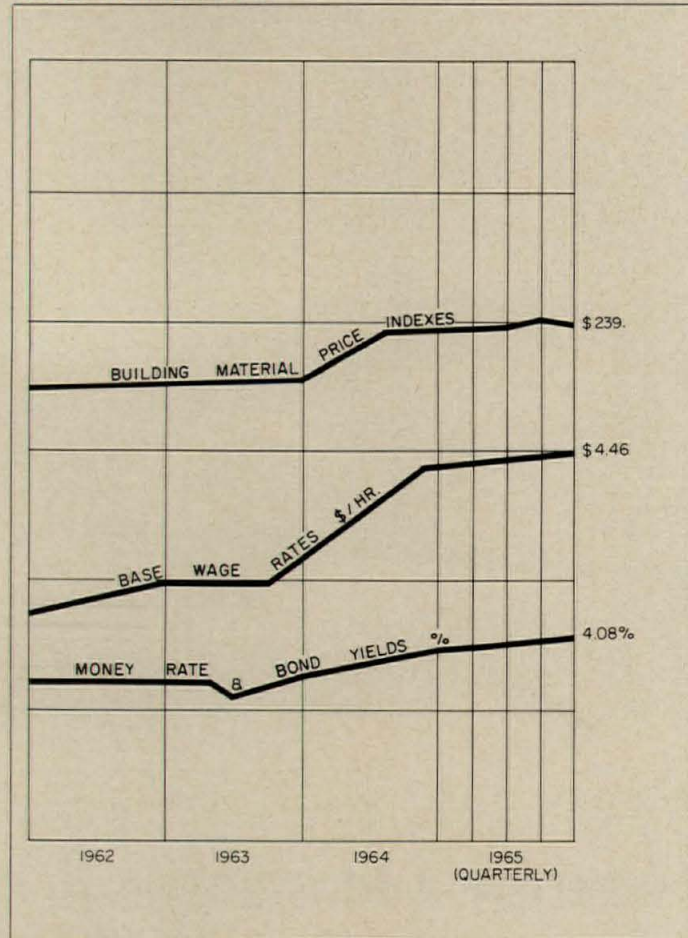
OCTOBER 1965 BUILDING COST INDEXES

1941 averages for each city = 100.0

Metropolitan area	Cost differential	Current Dow Index		% change year ago res. & non res.
		residential	non-res.	
U.S. Average	8.5	260.0	289.4	+2.03
Atlanta	7.2	307.0	325.7	+3.41
Baltimore	7.9	273.4	290.8	+1.78
Birmingham	7.4	250.5	269.3	+1.68
Boston	8.5	246.9	261.4	+2.26
Chicago	8.9	300.8	316.4	+1.66
Cincinnati	8.8	261.4	277.8	+1.55
Cleveland	9.4	279.1	296.7	+3.28
Dallas	7.7	255.1	263.4	+1.52
Denver	8.3	279.9	297.5	+2.33
Detroit	9.0	274.5	288.1	+2.52
Kansas City	8.3	245.6	259.9	+2.35
Los Angeles	8.4	277.8	303.9	+3.09
Miami	8.4	267.8	281.1	+1.13
Minneapolis	8.8	271.3	288.4	+0.92
New Orleans	7.8	245.3	259.9	+2.44
New York	10.0	282.8	304.2	+2.66
Philadelphia	8.7	270.7	284.2	+2.03
Pittsburgh	9.0	254.2	270.2	+1.10
St. Louis	9.1	268.8	284.8	+3.23
San Francisco	8.5	344.6	377.1	+0.87
Seattle	8.4	247.1	276.2	+0.86

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 ($8.0 \div 10.0 = 80\%$) 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	1958	1959	1960	1961	1962	1963	1964 (Quarterly)				1965 (Quarterly)			
								1st	2nd	3rd	4th	1st	2nd	3rd	4th
								U.S. Average	213.5	248.9	255.0	259.2	264.6	266.8	273.4
Chicago	223.5	277.7	283.3	289.0	294.7	298.2	305.7	310.0	312.3	313.4	313.7	313.9	317.9	320.6	321.5
Atlanta	213.3	251.9	264.5	272.6	269.9	271.8	275.5	277.2	279.3	280.5	280.6	280.5	281.0	284.7	285.7
Baltimore	208.1	233.2	233.2	240.2	249.9	250.0	256.3	258.0	259.9	260.1	260.9	261.2	264.1	264.9	265.6
Birmingham	199.0	230.5	230.5	232.8	237.5	239.8	244.1	246.1	247.9	251.3	252.1	251.7	252.6	256.3	257.8
Boston	231.2	273.2	278.6	284.2	289.9	292.0	301.0	302.2	304.5	305.1	306.6	306.5	307.3	310.2	311.7
Cincinnati	207.7	250.0	250.0	255.0	257.6	258.8	263.9	265.1	267.1	268.9	269.5	269.4	270.2	272.9	274.0
Cleveland	220.7	257.9	260.5	263.1	265.7	268.5	275.8	276.3	278.4	282.0	283.0	282.3	283.4	290.8	292.3
Dallas	221.9	230.5	237.5	239.9	244.7	246.9	253.0	253.7	255.6	255.6	256.4	256.9	257.9	259.5	260.8
Denver	211.8	252.8	257.9	257.9	270.9	274.9	282.5	282.6	284.7	287.3	287.3	287.3	288.2	292.7	294.0
Detroit	197.8	239.8	249.4	259.5	264.7	265.9	272.2	272.7	274.7	277.7	277.7	277.7	279.3	283.5	284.7
Kansas City	213.3	235.0	239.6	237.1	237.1	240.1	247.8	246.2	248.0	249.6	250.5	251.2	252.0	255.0	256.4
Los Angeles	210.3	253.4	263.5	263.6	274.3	276.3	282.5	284.0	286.1	286.1	288.2	288.9	289.7	295.8	297.1
Miami	199.4	239.3	249.0	256.5	259.1	260.3	269.3	270.1	272.1	273.1	274.4	274.4	275.4	276.6	277.5
Minneapolis	213.5	249.9	254.9	260.0	267.9	269.0	275.3	275.0	277.1	281.6	282.4	283.4	283.6	283.9	285.0
New Orleans	207.1	235.1	237.5	242.3	244.7	245.1	248.3	247.1	248.9	249.3	249.9	250.5	253.1	255.1	256.3
New York	207.4	247.6	260.2	265.4	270.8	276.0	282.3	284.8	286.9	289.7	289.4	290.2	294.0	296.0	297.1
Philadelphia	228.3	257.6	262.8	262.8	265.4	265.2	271.2	271.1	273.1	274.5	275.2	275.5	276.4	279.5	280.8
Pittsburgh	204.0	236.4	241.1	243.5	250.9	251.8	258.2	260.8	262.7	262.9	263.8	264.0	264.9	265.9	267.0
St. Louis	213.1	239.7	246.9	251.9	256.9	255.4	263.4	266.8	268.8	271.4	272.1	272.9	276.1	279.9	280.9
San Francisco	266.4	308.6	321.1	327.5	337.4	343.3	352.4	358.2	360.9	364.1	365.4	366.6	366.9	367.7	368.6
Seattle	191.8	225.8	232.7	237.4	247.0	252.5	260.6	260.1	262.0	265.7	266.6	265.1	266.3	267.8	268.9

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 ($150.0 \div 200.0 = 75\%$) or they are 25% lower in the second period.



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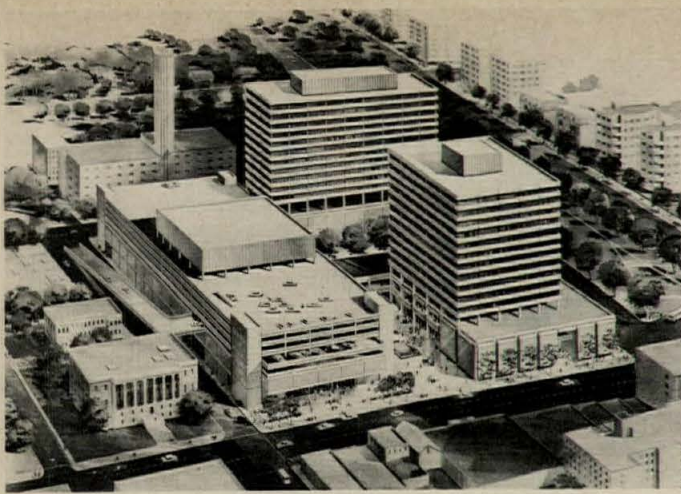
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Office and retail complex has parking for 1800

White Plains (New York) Plaza is a privately financed \$35-million development which will consist of two 15-story office towers, a 100,000-square-foot enclosed shopping arcade, parking for 1,800 cars, and the largest Sears Roebuck and Company retail store east of the Mississippi River. Architect for the project is Charles Luckman Associates, Inc. and the general contractor is the George A. Fuller Company. The project will be built on a five-and-one-half acre site in the downtown area.

The two office towers, each containing 250,000 square feet, will rise 12 stories from three-story bases. The square-shaped south tower will be located over a two-story air-conditioned shopping arcade, a 300-seat restaurant, and an 800-seat cinema. The rectangular north tower will be located over a bank and other commercial tenants.

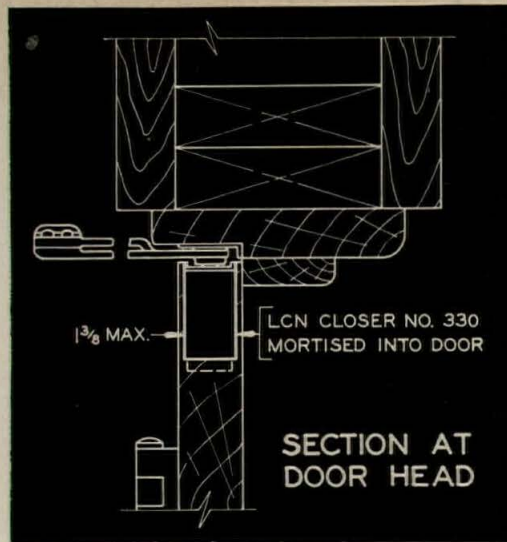
The Sears Roebuck store will be located in three stories of a third building on the site and will contain 315,000 square feet. The six upper levels of the buildings will provide parking for 1,800 cars and will be approached by three sets of ramps.



Shopping arcade.



Plaza arcade entrance.



Application Details

for LCN concealed-in-door closer installation shown on opposite page

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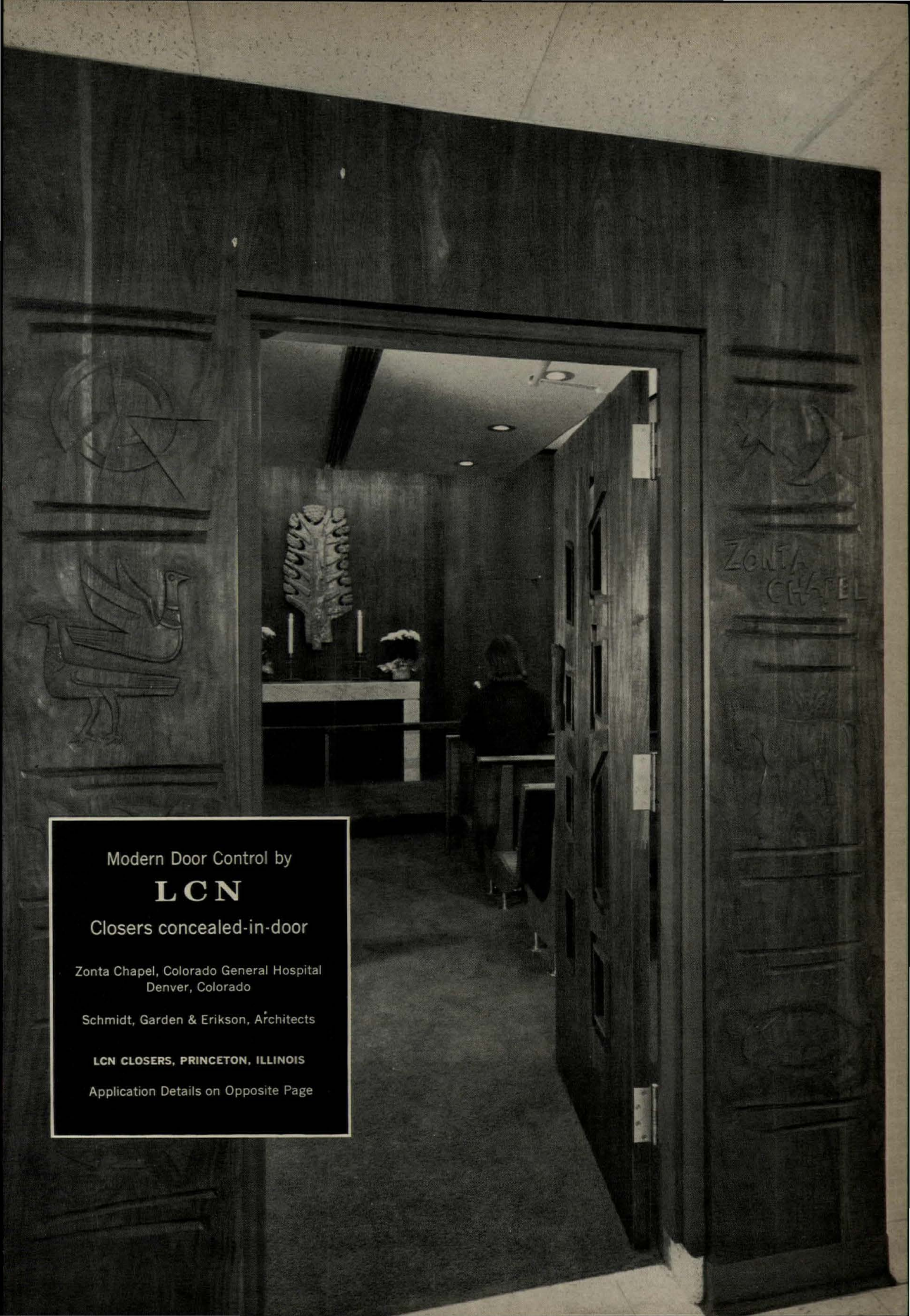
LCN

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Closers concealed-in-door

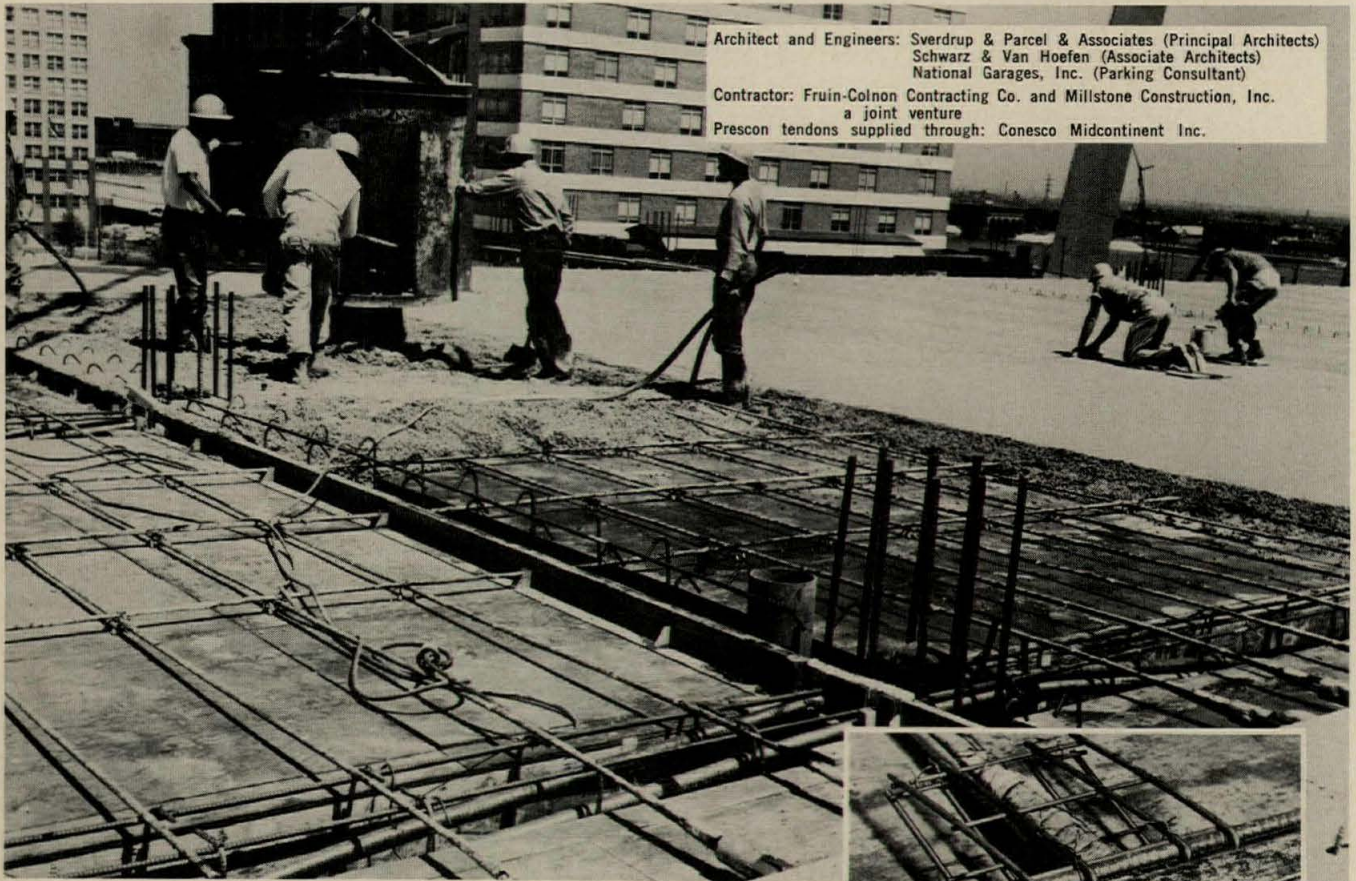
Zonta Chapel, Colorado General Hospital
Denver, Colorado

Schmidt, Garden & Erikson, Architects

LCN CLOSERS, PRINCETON, ILLINOIS

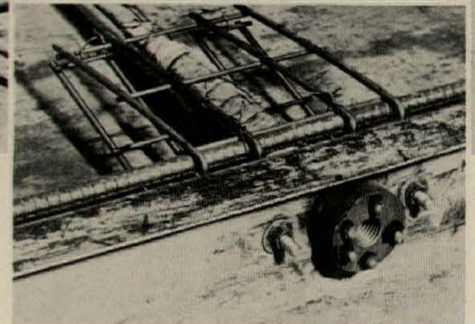
Application Details on Opposite Page

How to build a parking garage with 54 ft. spans and beams 2 ft. - 3 in. deep



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 Schwarz & Van Hoefen (Associate Architects)
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Stadium Parking Garage East of the Civic Center Redevelopment Corp.'s Downtown Sports Stadium Project, St. Louis, has nine parking decks, each 510' x 216', providing for self-parking 2,640 cars. Levels 2 through 9 have beams (2'3" deep) and slabs (5" thick), both post-tensioned using Prescon positive end anchorage tendons. Concrete for the columns was placed only after the deck and beams to be supported had been post-tensioned. This permitted elastic shortening of the lightweight concrete decks, without restraint.

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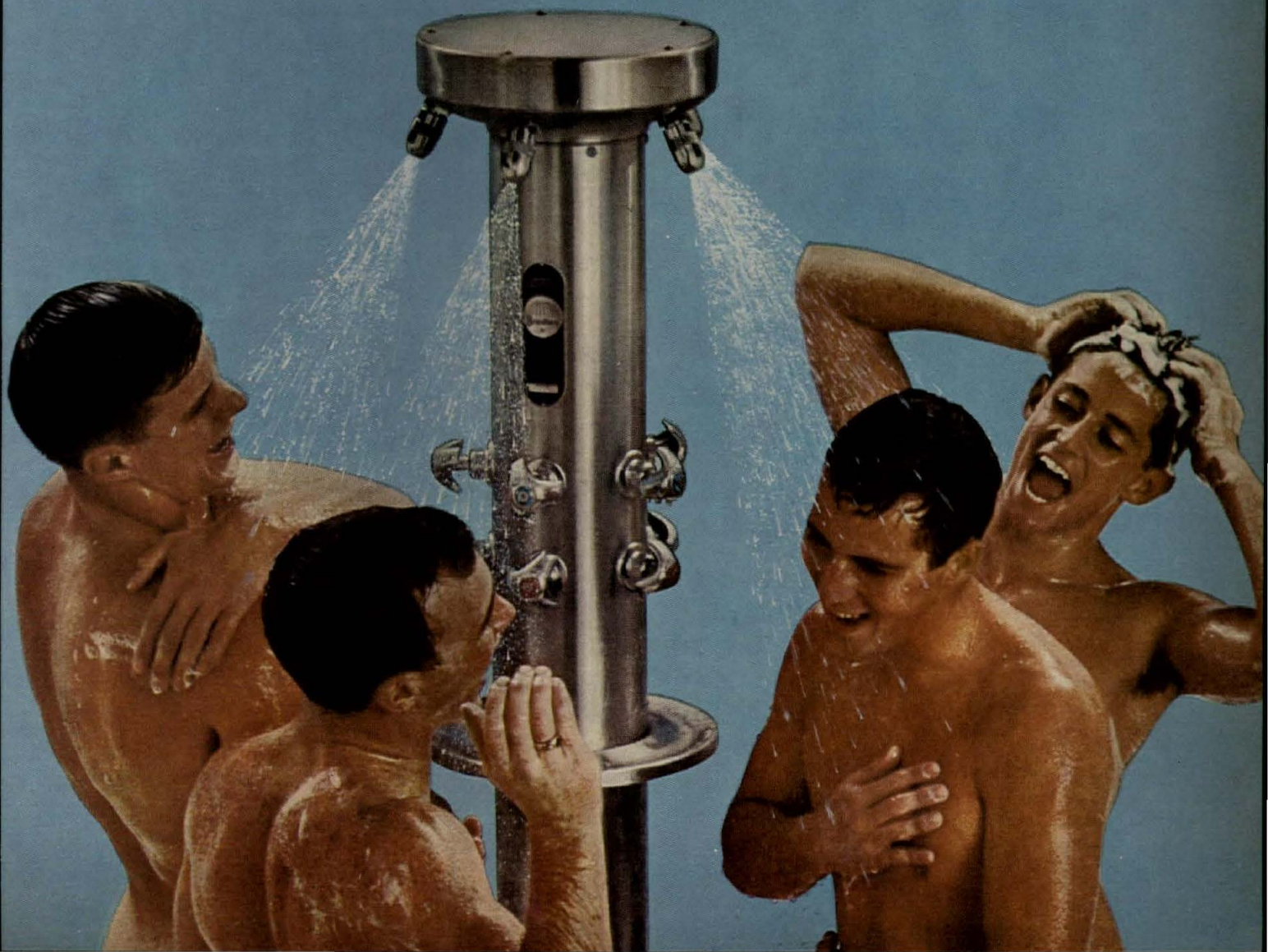
Planning a shower room? It will pay you to get together with Bradley!

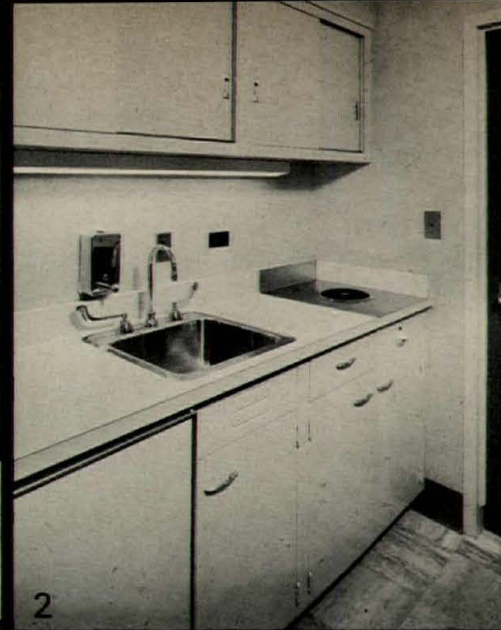
For details, see your Bradley representative. And write for latest literature. Bradley Washfountain Co., 9107 Fountain Drive, Menomonee Falls, Wis. 53055.



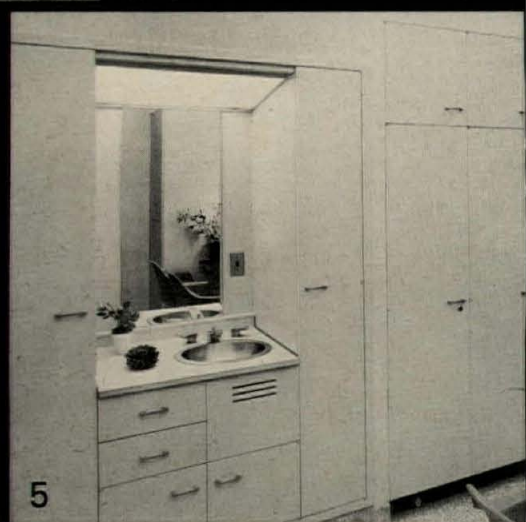
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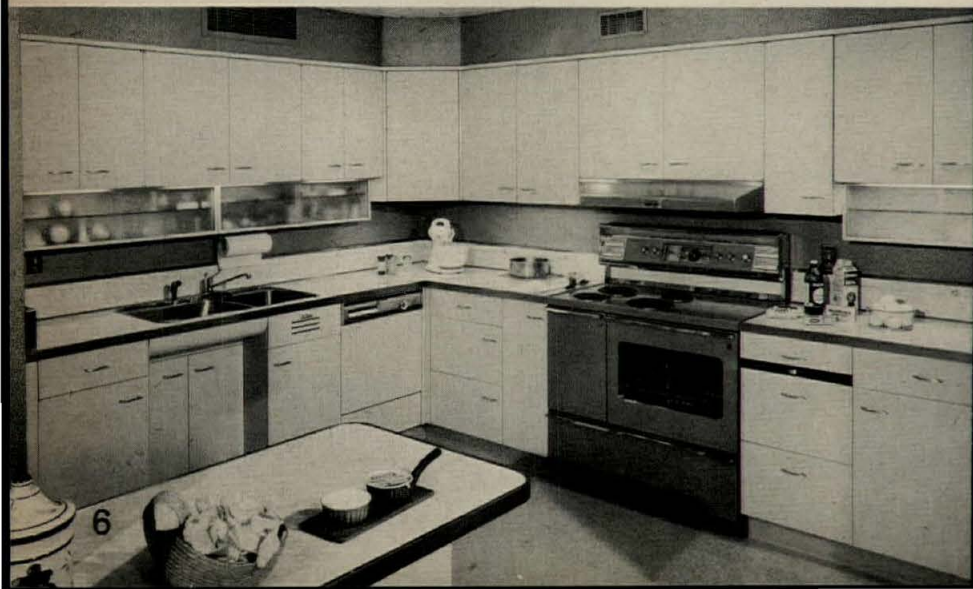
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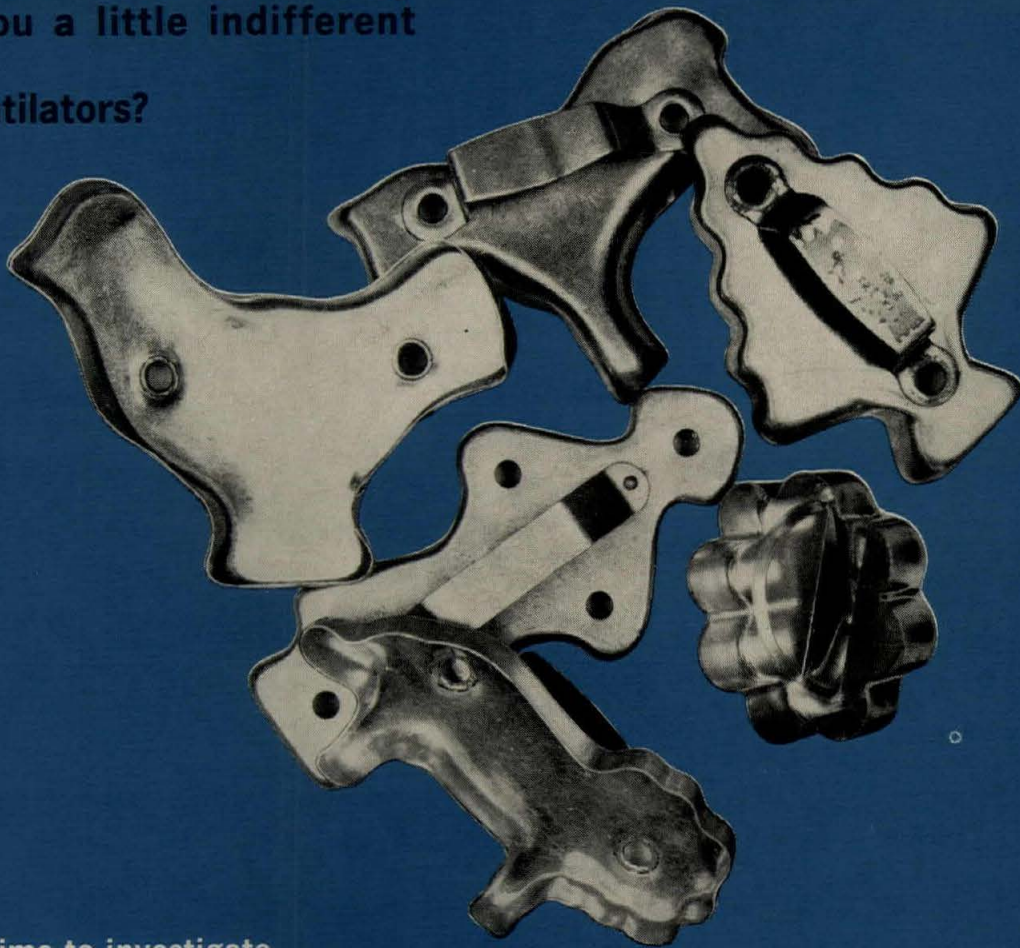
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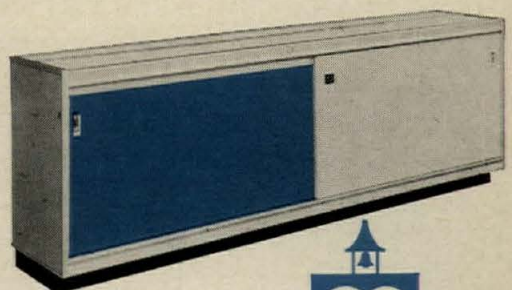
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The Metropolitan

THE GOLDEN HORSESHOE, *The Life and Times of the Metropolitan Opera House*. By Frank Merkling, John W. Freeman, and Gerald Fitzgerald with Arthur Solin. The Viking Press, Inc., 625 Madison Ave., New York, N. Y. 10022. 319 pp., illus. \$16.50.

This book on the 75-year-old New York Metropolitan Opera House, which is now in its final season, is an elegant collection of over 400 fascinating photographs in black and white and color. Although the authors briefly mention the architects, the design problems and the physical changes that were brought about through the years, the book is in the main devoted to the many personalities and the rich productions in the Metropolitan's history.

Modern movement

CHANGING IDEALS IN MODERN ARCHITECTURE: 1750-1950. By Peter Collins. McGill University Press, 3458 Redpath St., Montreal, Canada. 309 pp., illus. \$12.50.

Professor Collins skillfully brings together a discussion of the past two centuries of Western architecture in a series of 24 essays divided into five broad subjects: Romanticism, Revivalism, Functionalism, Rationalism, and the Influence of the Allied Arts. These essays are dense with information. The book is a useful complement to H. R. Hitchcock's *Nineteenth and Twentieth Century Architecture* and is exceedingly readable, bringing together essential ideas and documentation in a memorable way. The author separates the material horizontally by subjects and each subject vertically in time. Thus he can show the relevance of a great diversity of ideas.

For example, in discussing Revivalism, to which 10 concise essays are devoted, he neatly disentangles the chaos of formal abstractions which were the physical projections of Romantic and Classical ideals. Primitivism and Roman, Greek, Renaissance, and Gothic revivals are seen not as short phenomena centered around one particular group of

buildings, but as having had, in fact, long and complex histories, which Professor Collins elucidates with great erudition. The book clearly establishes that a style does not begin with some single physical manifestation at one particular date. In establishing this thesis, Professor Collins draws in large measure from the intellectual history of the past two hundred years. Thus the book is not a formal history of architecture based on a chronological development of monuments but, as the title promises, a unique study of architecture as a reflection of the intellectual and creative expression of man.

The second half of the book deals with Functionalism, Rationalism, and the relationship of architecture and the allied arts, bringing to the fore subjects about which so much has been written already. However, Professor Collins marshals enough provocative insights to hold the attention of even the well-informed. In discussing the relationship between architecture and furniture design he points out that Rietveld and Breuer, "form-givers" to the Modern movement, not only began as furniture designers but that their architecture still bears curious analogies to the thought process involved in the conception of a piece of furniture. This leads one to wonder: does the pristine pavilion on piers, so recently in vogue (e.g., the entries of the Toronto City Hall Competition), bear a real affinity to the piloti of Le Corbusier, as is generally professed? Or, is it not a development from the less architectural interest of furniture design? It appears as if the idea that there are only quantitative considerations that separate the design

of a chair and of a building still exist. This raises the thorny problem of scale in contemporary architecture, a problem aggravated, Professor Collins points out, by an excessive use of models in the design of buildings (the model seen from above giving the impression of a piece of furniture). Somewhere, between the small scale model and the finished building, the essential elements are apt to be lost. Studying and executing the *minutiae* of a building in great detail does not add up to a satisfactory whole; as exemplified by the Chase Manhattan Bank. It is this kind of awareness about architecture that makes this book of particular interest to architects.

Raymond Lifchez

Accurate church architecture

CHRIST AND ARCHITECTURE. By Donald J. Bruggink and Carl H. Droppers. William B. Eerdmans Publishing Company, Grand Rapids, Mich. 708 pp., illus. \$20.00.

While this book is addressed specifically to the congregations of the Presbyterian Reformed Church, it would prove helpful to the congregations of all religions as well as to architects.

Mr. Bruggink is a minister of the Reformed Church in America and is now assistant professor of Historical Theology at Western Theological Seminary. In the first part of the book he explains the importance of theology and liturgy to the design of the church, a relationship which he asserts is too often missing in religious architecture today. Says Mr. Bruggink, "...While American architects frequently offer brilliant solutions to structural problems, the general architectural impression is, from a theological viewpoint, one of chaos."

Mr. Droppers is an assistant professor at Western Reserve University in the Department of Architecture. In the second part of the book, writing primarily for laymen, he discusses the more important technical considerations.

There are many good black and white photographs showing a number of fine contemporary churches. The photographs alone make the book valuable for architects.

continued on page 84

THIS MONTH'S BOOKS

REVIEWS

Donald J. Bruggink and Carl H. Droppers, "Christ and Architecture"	78
Peter Collins, "Changing Ideals in Modern Architecture: 1750-1950"	78
Frank Merkling, John W. Freeman, and Gerald Fitzgerald with Arthur Solin, "The Golden Horseshoe, The Life and Times of the Metropolitan Opera House"	78
Verna Cook Shipway and Warren Shipway, "Mexican Homes of Today"	84
Urban Renewal Administration, "Design Objectives in Urban Renewal Documents"	84
BOOKS RECEIVED	98

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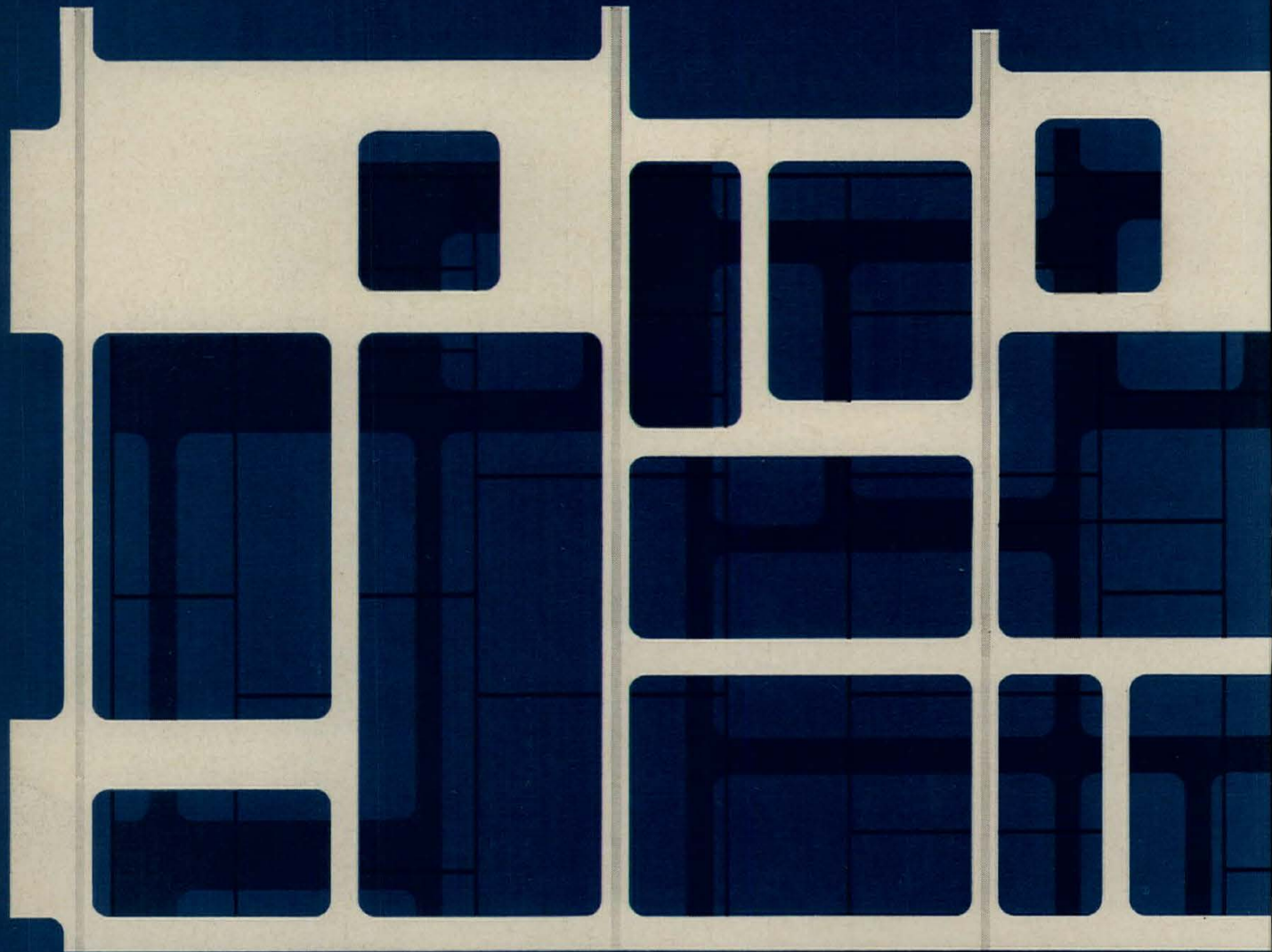
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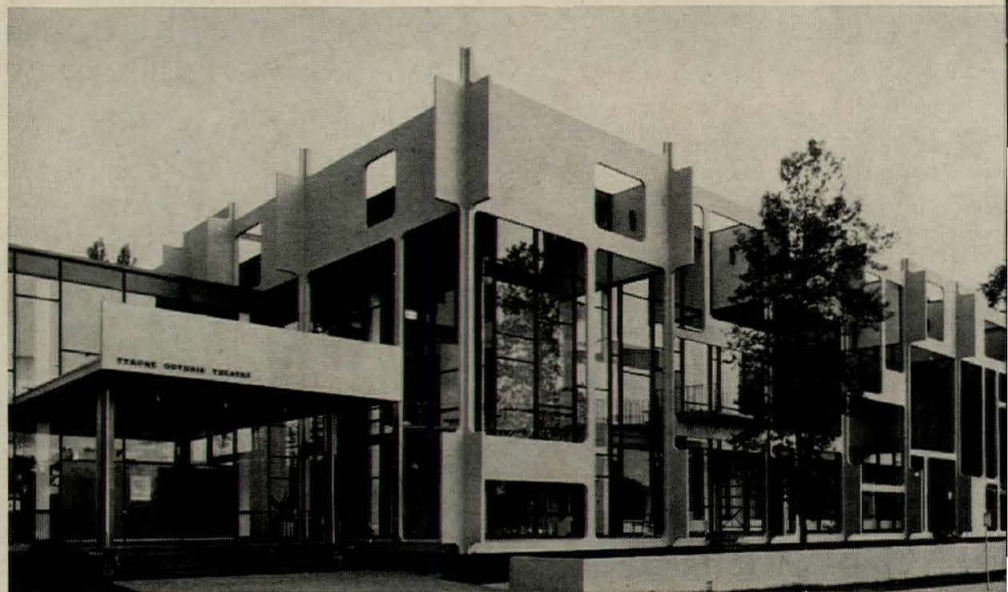
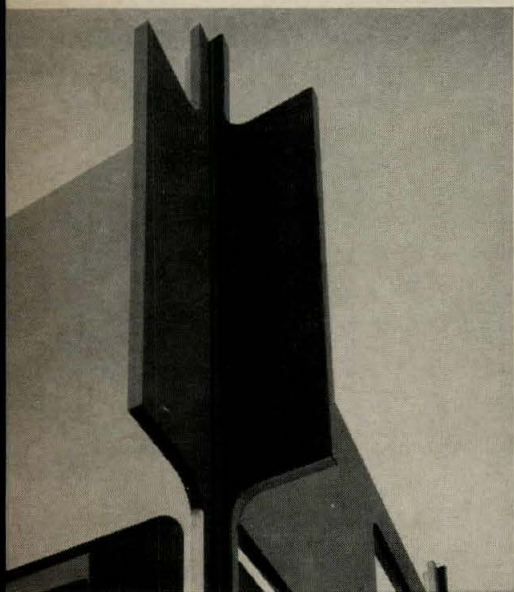
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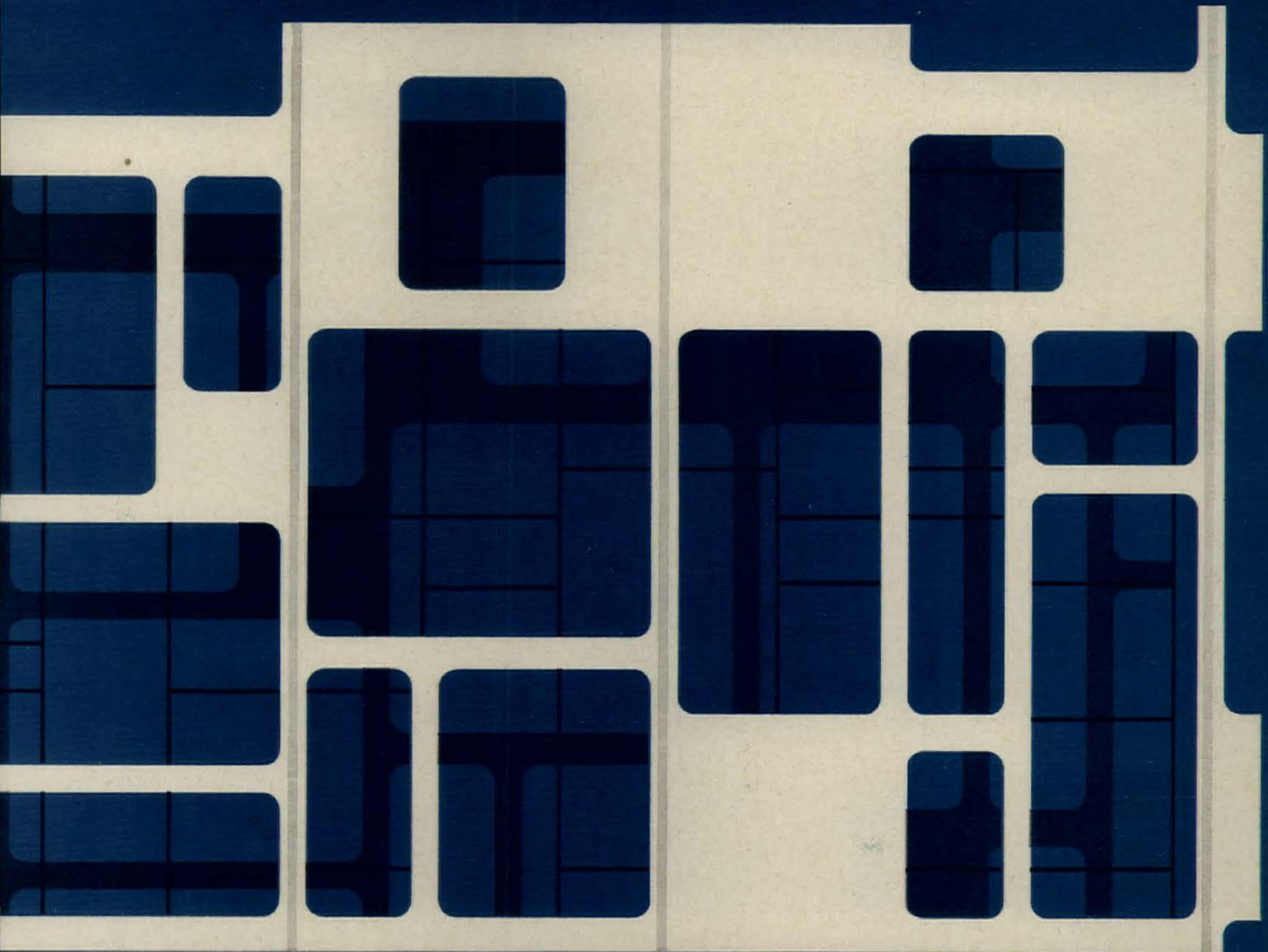
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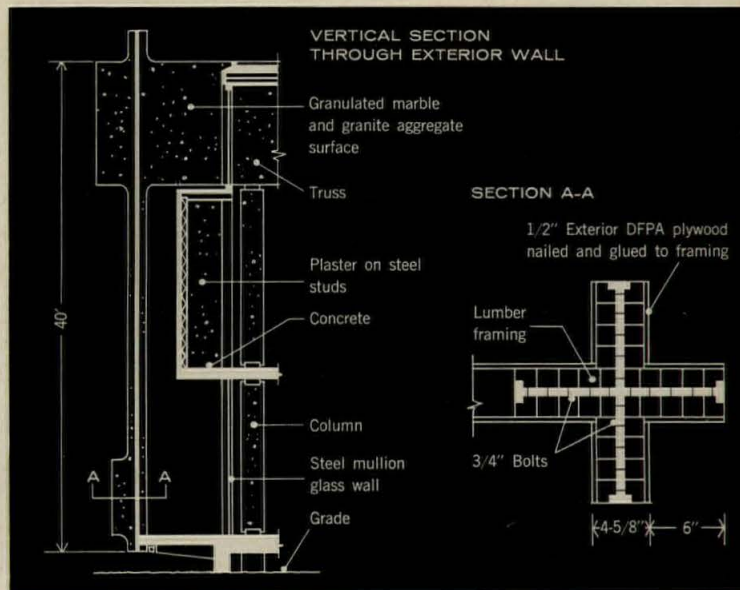
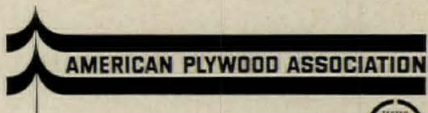
the most exciting ideas take shape in plywood

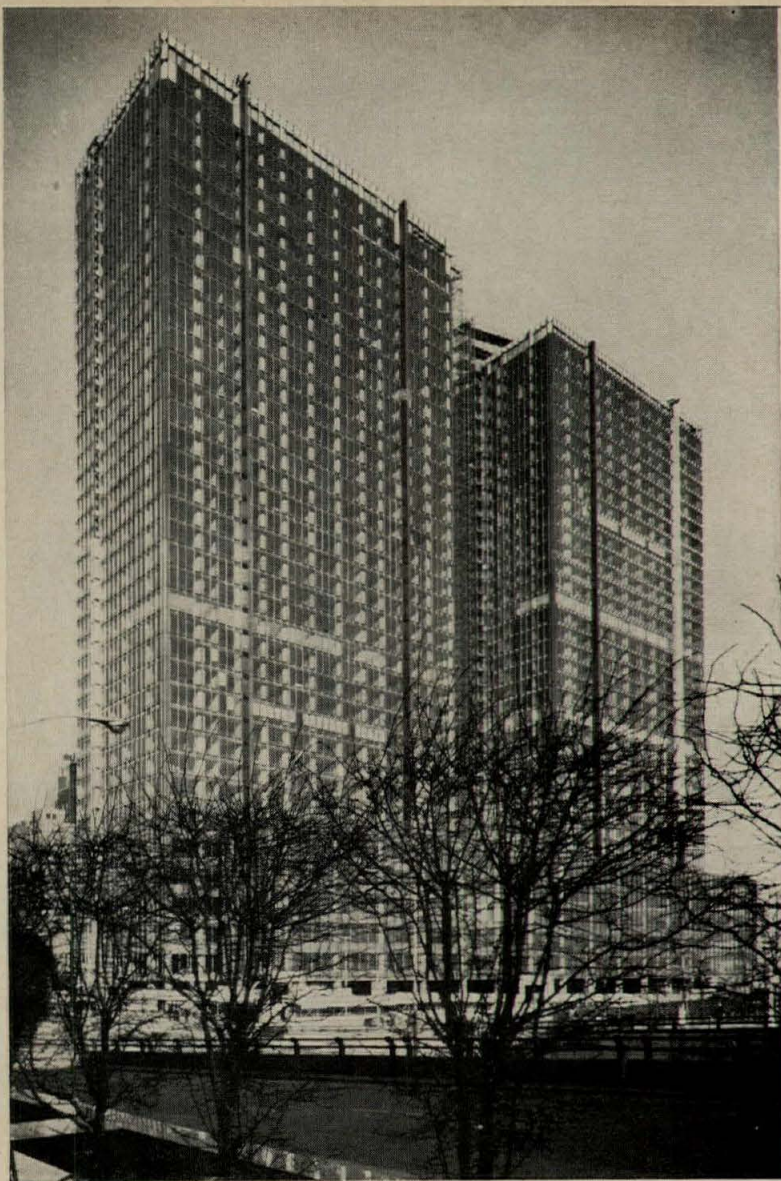




Orpheus Guthrie Theater, Minneapolis, Minn. / Architect: Ralph Rapson, A.I.A., Architects, Inc. / Structural Engineers: Meyer & Borgman / Contractor: Watson Construction Co.

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





Photograph by Felix Gilbert

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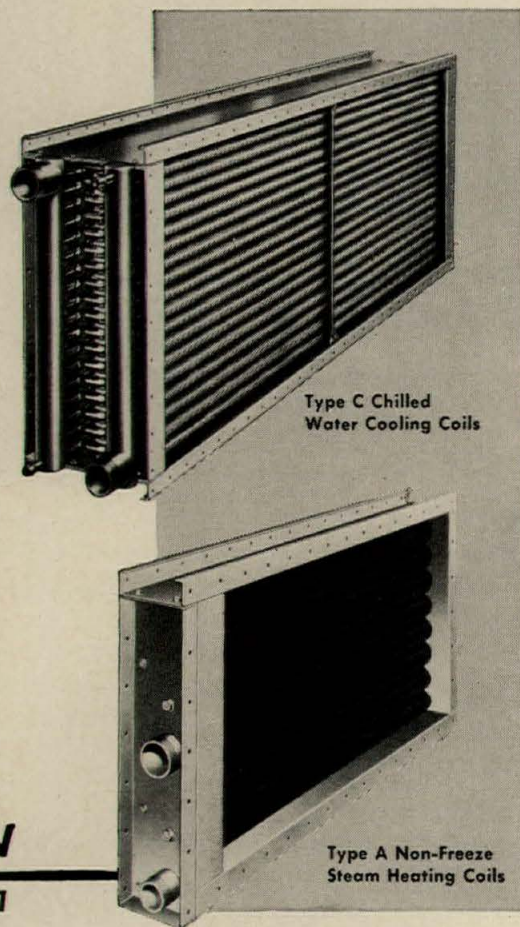
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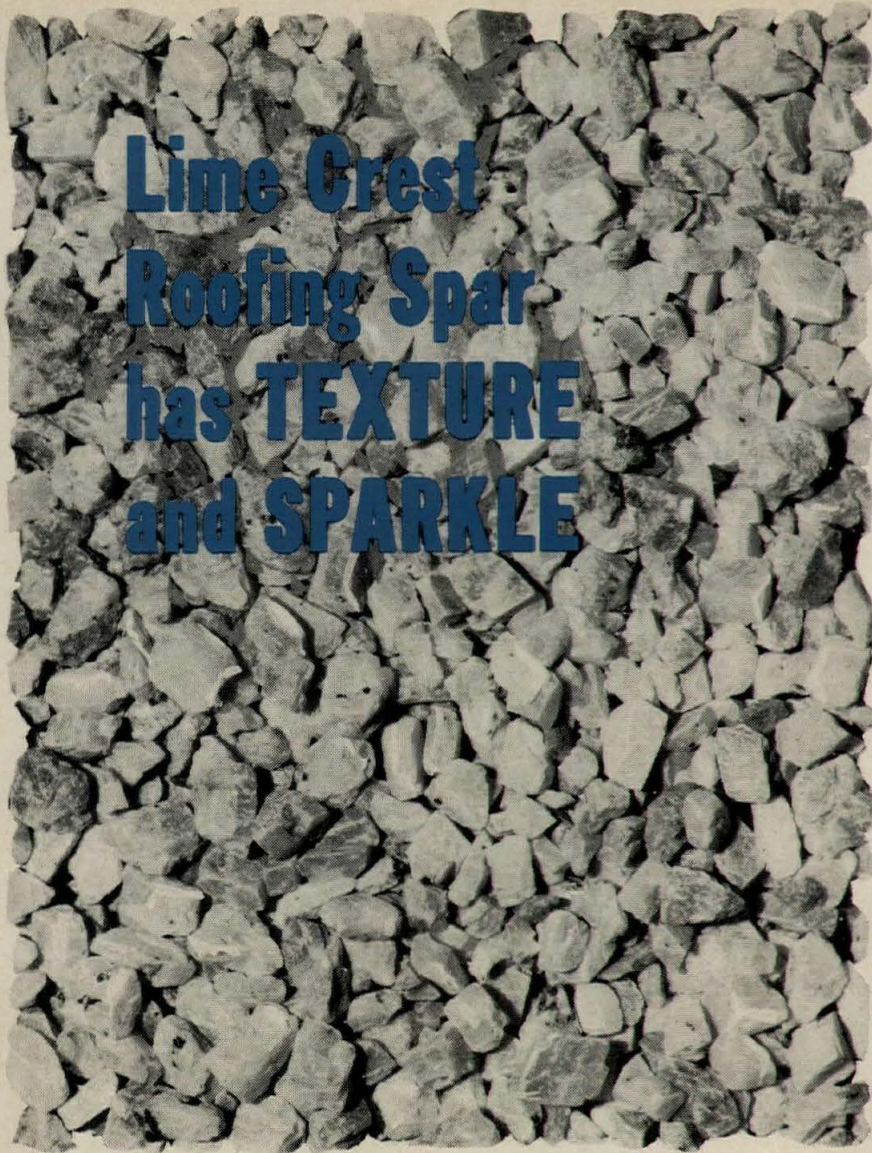
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Urban renewal

DESIGN OBJECTIVES IN URBAN RENEWAL DOCUMENTS. *Technical Guide No. 16* by the Urban Renewal Administration. Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402. 25 pp., illus. \$.25.

This is the second in a series of four guides to better urban design. Housing Administrator Robert C. Weaver states, "This series comprises one of the most significant explorations of good urban design and how to obtain it. Good urban design cannot be achieved by leaving it to whim or happenstance. It can come only from conscious, articulate objectives that are clearly stated for property owners, residents, prospective developers, and the public at large."

The publication analyzes two types of urban renewal documents: the urban renewal plan and the disposition documents. Examples of design objectives, urban renewal plans, land use maps, illustrative site plans, and design plans are drawn from documents now in use.

The first publication in the series, *Technical Guide No. 15, Design Review in Urban Renewal*, may be purchased from the address listed above for \$.30.

Graphics standards

REINHOLD DATA SHEETS. By William J. Hornung. Reinhold Publishing Corp., 430 Park Ave., New York, N. Y. 10022. 238 pp., illus. \$15.00.

Architects, engineers, designers and draftsmen will find this a practical, up-to-date reference, though by no means as all inclusive as the well-known *Architectural Graphic Standards*.

Information on new construction methods is arranged sequentially to deal with the main aspects of building: sub-soil constructions; wall systems; floor and roof systems; and methods of construction, including details, surface, and finish treatments.

Mexican homes

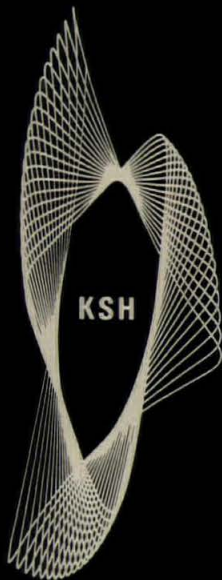
MEXICAN HOMES OF TODAY. By Verna Cook Shipway and Warren Shipway. Hastings House Publishers Inc., 151 E. Fiftieth St., New York, N. Y. 10022. 249 pp., illus. \$12.95.

This book is a collection of black and white photographs, many of which are excellent, showing the wide range of ornaments, mostly antique, found in

continued on page 98

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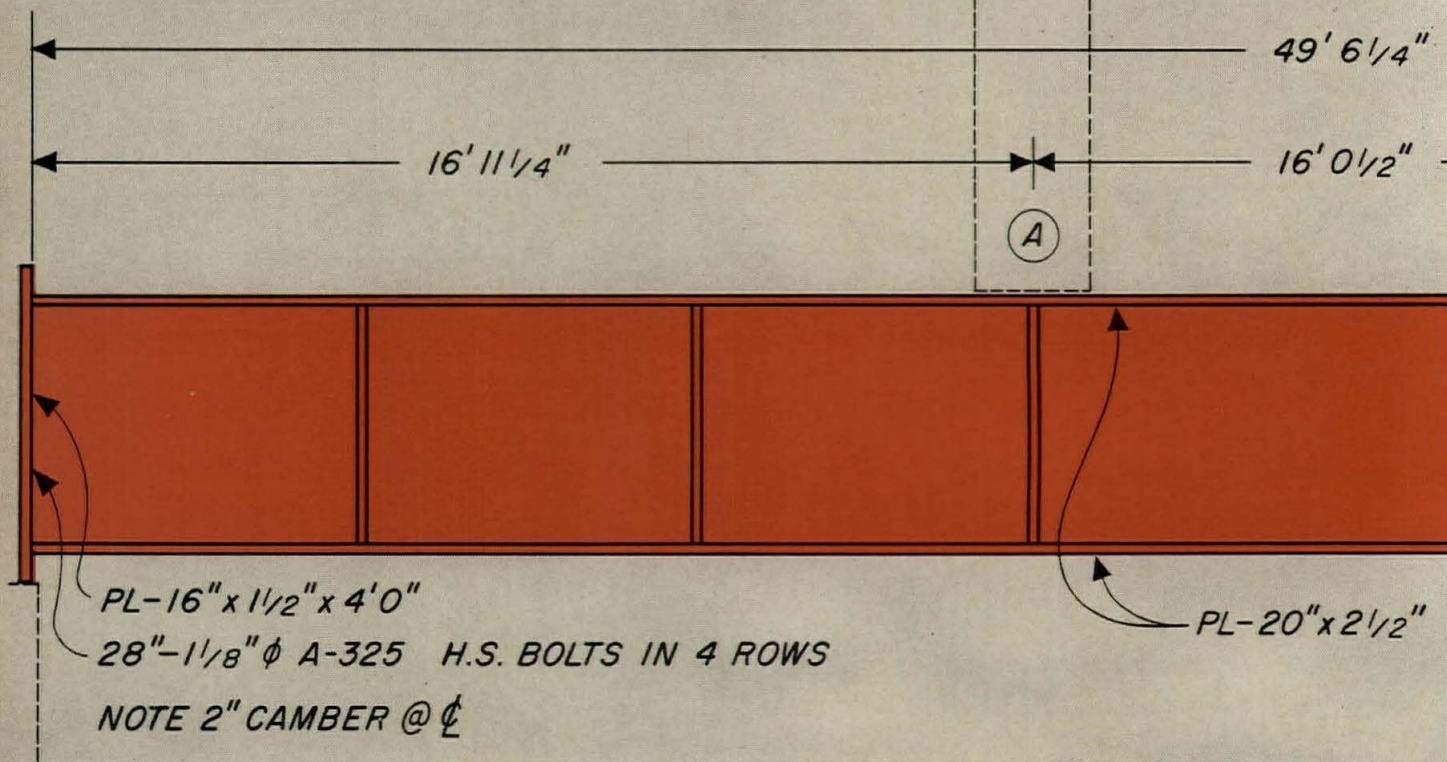
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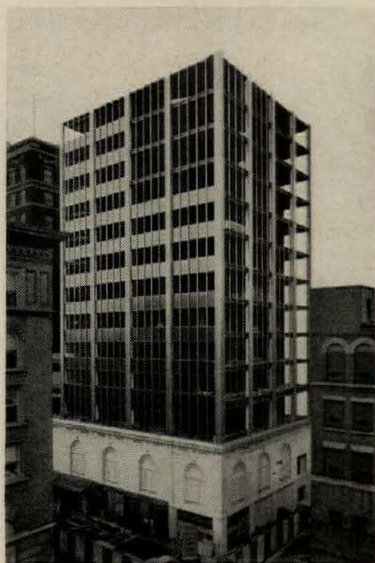
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**SCHEMATIC DRAWING
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FOR BLISS TOWER,
CANTON, OHIO**



USS "T-1" Steel girders raise the ceiling 2 feet



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The Bliss Tower, Canton, Ohio, as originally constructed, consisted of a three-story steel-framed base with a high rise tower over part of it. The remainder of the base was built strong enough so that a second tower could be added later.

When the addition was planned, the owners decided they needed a large column-free area 49' x 57' on the fourth floor (the roof of the three-story base, which is actually the annex of the Onesto Hotel). This posed the problem of spanning 49 feet with two girders that could take the interior column loads from the upper 10 floors. (See A & B on diagram.)

Preliminary calculations showed that A36 steel girders would have to be 5 feet deep to do the job . . . but this depth cut down too much



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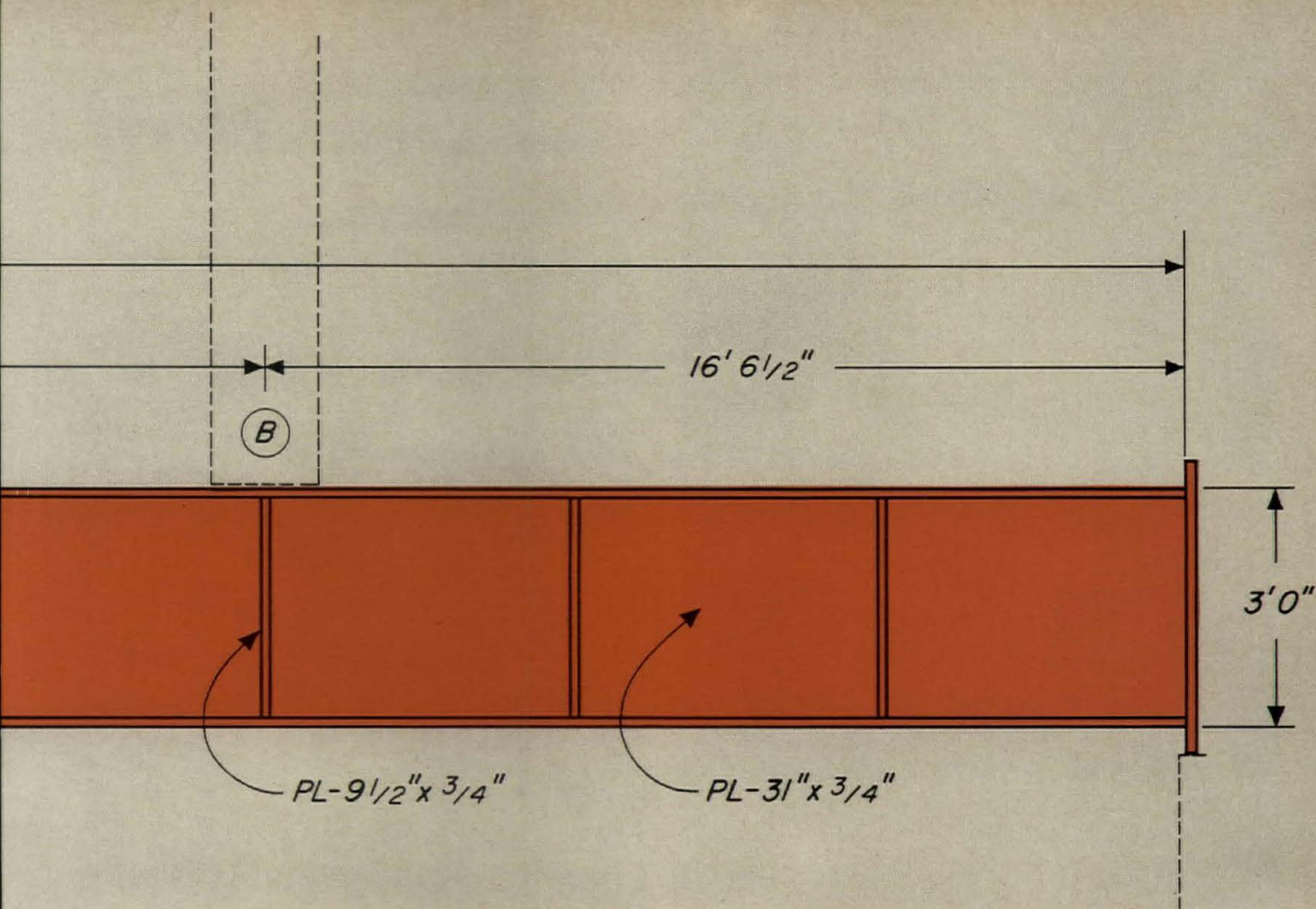


Diagram of girder construction. Columns are placed at points A and B to support the 10 floors above.

in Bliss Tower

on headroom. By using "T-1" Steel for the girders, engineers cut girder depth to 3 feet and avoided reducing headroom to an undesirable point.

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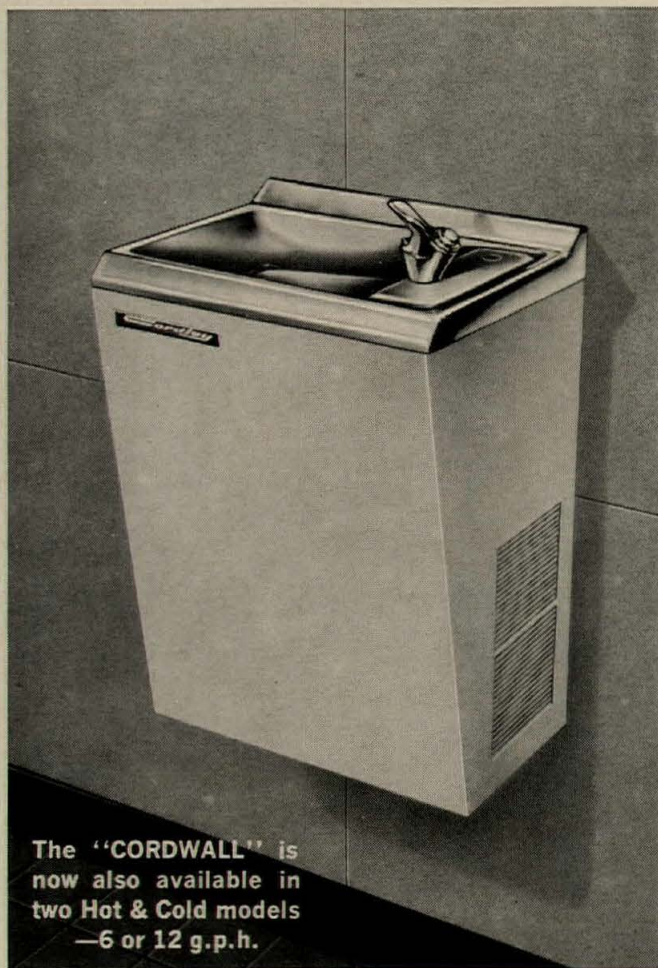
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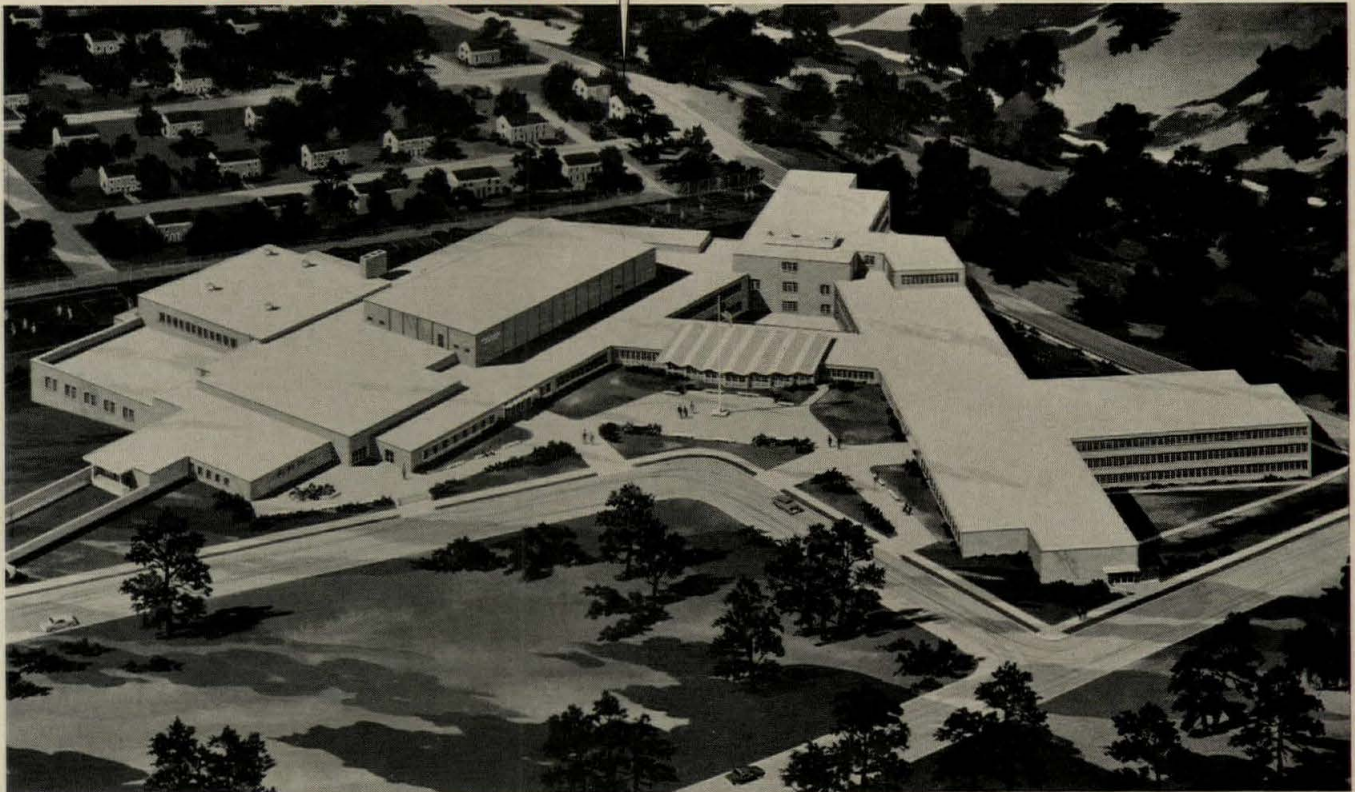
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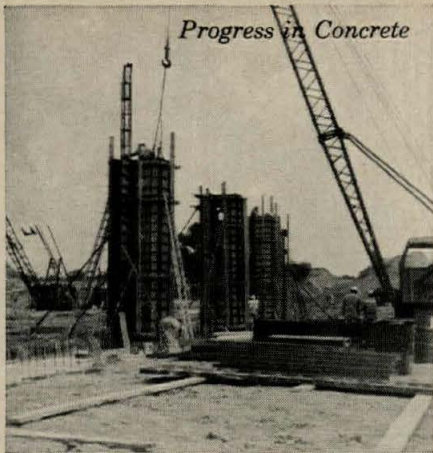


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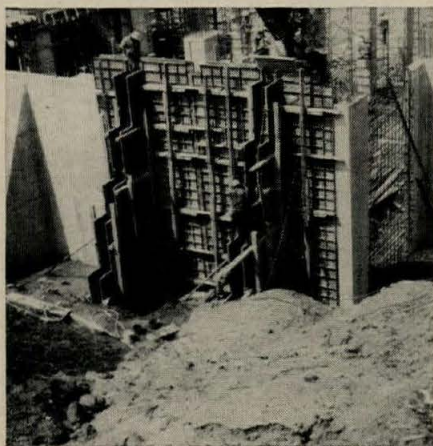
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continued from page 84



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contemporary Mexican homes. The ornaments include fountains, doorways, wall hangings, sculptures, etc. in imaginative juxtaposition to the architecture of the present. These are so attractively presented that they might induce the reader to take a trip to Mexico, but the book itself would prove a worthless guide. There has been little attempt at organization whether by type of ornament or by period or location. Also, there has been little effort to trace the actual influence or origin of many of the ornaments. The book is for browsing only.

BOOKS RECEIVED

1965 BOOK OF ASTM STANDARDS ON CONCRETE AND MINERAL AGGREGATES. By the American Society for Testing and Materials, 1916 Race St., Philadelphia, Pa. 19103. 592 pp. \$10.00.

FILARETE'S TREATISE ON ARCHITECTURE, *Treatise* by Antonio di Piero Averlino. Translated with an Introduction and Notes by John R. Spencer. Yale University Press, New Haven, Conn. Volume I: The Translation, 339 pp.; Volume II: The Facsimile, 192 pp., illus. \$60.00 the two volumes.

LE CORBUSIER, 1957-1965. Published by W. Boesiger. Artemis Verlag, Zurich 24, Switzerland. 239 pp., illus. \$18.50.

CONSTRUCTION SCHEDULING AND CONTROL. By George E. Deatherage. McGraw-Hill Book Co., 330 W. 42nd St., New York, N. Y. 10036. 316 pp., illus. \$15.00.

URBAN DEVELOPMENT IN THE ALPINE AND SCANDINAVIAN COUNTRIES. By E. A. Gutkind. The Free Press, The Macmillan Company, 60 Fifth Ave., New York, N. Y. 10011. 500 pp., illus. \$25.00.

HELMUT JACOBY ARCHITECTURAL DRAWINGS. Introduction by Claudius Coulin. Frederick A. Praeger, Publishers, 111 Fourth Ave., New York, N. Y. 10003. Unpaged, illus. \$13.75.

LOUISIANA PLANTATION HOMES: COLONIAL AND ANTE BELLUM. By W. Darrell Overdyke. Architectural Book Publishing Co., 151 E. 50th St., New York, N. Y. 10022. 208 pp., illus. \$12.50.

CITIES. By the Editors of SCIENTIFIC AMERICAN. Alfred A. Knopf, Inc., 501 Madison Ave., New York, N. Y. 10022. 211 pp., illus. Clothbound, \$4.95; Paperbound, \$2.45.

MONKS, NUNS, AND MONASTERIES. By Sacheverell Sitwell. Holt, Rinehart and Winston, Inc., 383 Madison Ave., New York, N. Y. 10017. 205 pp., illus. \$12.50.

SIGNS IN ACTION. By James Sutton. Reinhold Publishing Corp., 430 Park Ave., New York, N. Y. 10022. 96 pp., illus. \$2.25.

ISE: PROTOTYPE OF JAPANESE ARCHITECTURE. By Kenzo Tange and Noboru Kawazoe. The M.I.T. Press, Cambridge, Mass. 02142. 212 pp., illus. \$17.50.

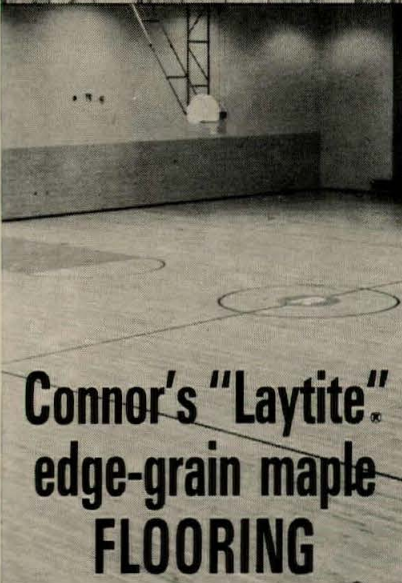
ANNUAL BULLETIN OF HOUSING AND BUILDING STATISTICS FOR EUROPE 1964. Prepared by the Secretariat, United Nations. United Nations, Sales Section, New York or Geneva. 71 pp. \$.75.

SAUNA: THE FINNISH BATH. By H. J. Viherjuuri. The Stephen Greene Press, Brattleboro, Vt. 87 pp., illus. \$3.95.

THE WORK OF FRANK LLOYD WRIGHT. By Frank Lloyd Wright. Horizon Press, 156 Fifth Ave., New York, N. Y. 10010. 200 drawings, photographs and plans. \$42.50.

A GUIDE TO THE COLLECTING AND CARE OF ORIGINAL PRINTS. By Carl Ziggrosser and Christa M. Gaehde. Crown Publishers, Inc., 419 Park Ave., South, New York, N. Y. 10016. 120 pp. \$4.95.

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URETHANE FOAM CUTS BUILDING COSTS OF 16-STORY STRUCTURE, IS EXPECTED TO REDUCE HEATING-COOLING BILLS BY 10 PERCENT

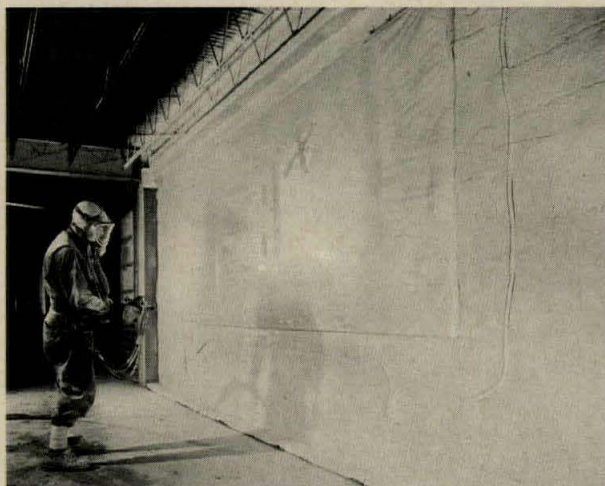
A unique wall construction, utilizing rigid urethane foam and chicken wire in place of the traditional insulating materials, is saving up to 10¢ per sq. ft. in the insulation costs of a 16-story, 444-unit apartment house within view of the nation's capital in Alexandria, Va.

The building, called the 4600 Duke, also marks the first commercial use of urethane foam as a base for plaster, according to Bryan Gordon, Jr., the owner and builder.

Urethane foam has twice the insulating ability of glass fiber, the next-best commercial insulating material. A local gas company estimated that heating and air-conditioning costs at 4600 Duke would average about \$20,000 annually if exterior walls were constructed conventionally. The company predicts the superior insulating ability of urethane foam will cut fuel costs by at least 10%.

But the big savings appear to be in time, labor and materials. To complete a 5000 sq. ft. wall section in one day, using standard wall construction, requires 20 men from three crafts—waterproofing specialists, carpenters and latherers, according to Gordon. He found that four men can insulate an equal amount of wall with urethane foam in the same time.

Standard wall insulation reportedly costs about 23¢ per sq. ft. in the Washington area. This includes 2¢ for the application of the asphalt vapor barrier, 15¢ for furring and 6¢ for rock lath. These three materials were eliminated by urethane foam.



Urethane chemicals are spray-applied to cinderblock wall by technique similar to paint spraying. Windows and electrical outlets are masked prior to spraying, but wiring, pipes, steel supports are completely covered with foam.

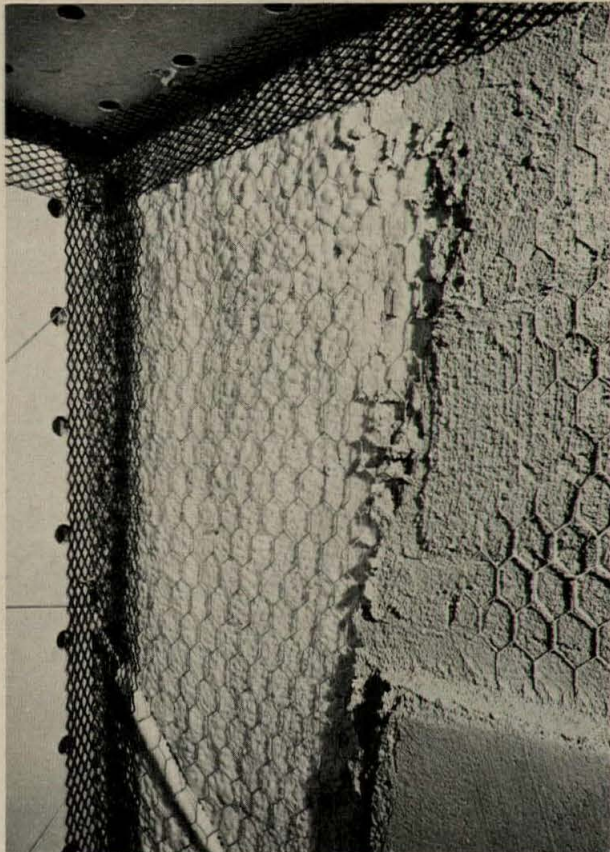
The estimated cost of applying urethane foam and installing the reinforcing wire for the plaster is 14-15¢ per sq. ft. Based upon the 171,260 sq. ft. of wall insulation in 4600 Duke, the minimum savings is \$13,700. Until final cost figures are compiled, Gordon prefers the more general estimate of 5-10¢ savings per sq. ft.

The exterior wall of 4600 Duke has four-inch-thick split rock on the exterior with four-inch-thick cinder block on the interior. Urethane foam was sprayed directly on the cinder block to a depth of < 1 inch. Fine mesh wire was fastened to the hardened foam and cinder block with 1¼-inch roofing nails. This wire serves as a mechanical bond to hold the plaster to the foam.

In the last wall-finishing operation, two coats of plaster were applied to a 5⁄8-inch depth. The



Use of rigid urethane foam as structural insulant for \$8-million apartment complex reduced construction costs, could shave \$2000 a year from heating and cooling bills.



Seamless surface of sprayed-on urethane foam is covered with fine wire which provides excellent plaster base. First rough coat of plaster is shown upper right; second finishing coat produces smooth interior wall surface, lower right.

first was a rough, filling coat while the second provided a smooth, interior finish.

Applied by the spray-in-place technique, the urethane chemicals leave the spray gun as a liquid, begin foaming immediately and reach 30 times original volume in seconds. The urethane foam chemical system, formulated and supplied by the Callery Chemical Company, was applied at the rate of 3-5 lbs. per minute under 1500-3000 psi.

The spray application bonds urethane foam insulation permanently to substrate surfaces, fills every crack and crevice creating a seamless, virtually airtight seal. Urethane foam will not shrink; resists mildew, mold and age deterioration; is vermin-proof.

Conventional walls require installation of a vapor barrier, wood furring strips and rock lath prior to plastering. One disadvantage of this construction is that condensation tends to form within the walls, particularly in air-conditioned build-

ings where interior and exterior temperatures can vary widely, accelerating moisture collection. This causes the furring to rot, sometimes resulting in water seepage through the wall.

A completely air-conditioned luxury apartment building, 4600 Duke required a material with high insulating ability, excellent resistance to dampness, good sound-absorbing qualities and one that would serve as a good plaster base.

"Sprayed-in-place urethane foam insulation provided all these advantages, plus a saving in construction costs," Gordon says.

In selecting an insulating material, Gordon rejected glass fiber mats because "they have a tendency to absorb moisture which destroys insulating properties." Urethane, on the other hand, is a cellular plastic material with a rigid, monolithic surface that seals out moisture.

The T-shaped 4600 Duke has three wings, each 60 ft. wide and ranging in length from 194-250 ft. The first two floors of the building provide parking space for tenants with apartments starting on the third floor. Apartments rent for up to \$245 a month.

Bryan Gordon, Jr., whose headquarters are in Alexandria, Va., started his business career as a real estate salesman in 1937. He built the first split-level subdivision in the U.S. in 1944 and during the late forties pioneered the country's first low-cost FHA housing project.

His next project will be a \$20 million, 1700-unit apartment building in Mt. Holly, N.J., which will also utilize urethane foam insulation.

For further information on this project, please contact any of the following sources:

Architects—Vosbeck-Vosbeck & Associates, Alexandria, Va.
Owner/Builder—Bryan Gordon Associates, Alexandria, Va.
Urethane Supplier—Callery Chemical Co., Callery, Pa.



M. Tulou, who supervised installation, and owner B. Gordon examine cured urethane foam section from wall surface.

For additional information on the use of urethane foam in other insulation and construction jobs, write on your letterhead to:

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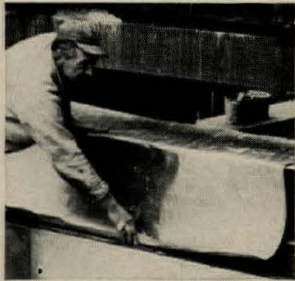
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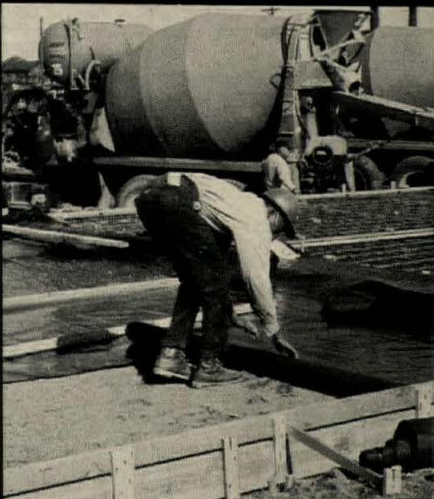
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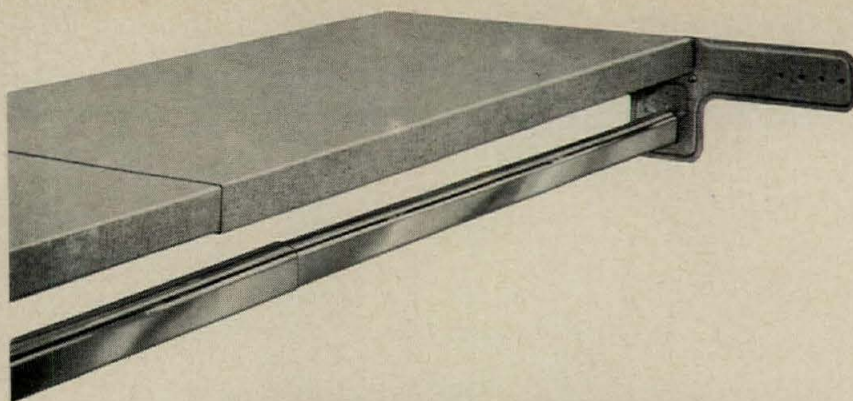
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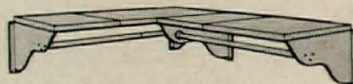
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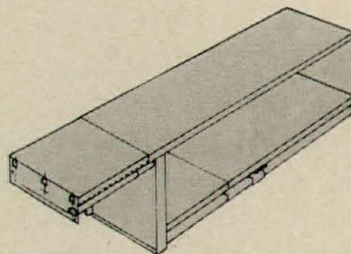
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ON THE CALENDAR

JANUARY

31 American Society of Civil Engineers Structural Engineering Conference—Hotel Fontainebleau, Miami Beach, Fla., through February 4

FEBRUARY

8-10 21st Annual Conference and Exhibit, Reinforced Plastics Division of the Society of the Plastics Industry—Edgewater Beach Hotel, Chicago

MARCH

5-11 Annual Convention, American Concrete Institute—Benjamin Franklin Hotel, Philadelphia

7-11 22nd Annual Technical Conference, Society of Plastic Engineers—The Queen Elizabeth Hotel, Montreal, Quebec

29 Fifth Annual Technical Meeting and Exhibits, American Association for Contamination Control—Shamrock Hilton Hotel, Houston; through April 1

OFFICE NOTES

OFFICES OPENED

R. W. Beck and Associates, analytical and consulting engineers with offices in Seattle, Denver, Columbus, Neb. and Phoenix, Ariz., have opened an area office at 1510 East Colonial Drive, Orlando, Fla. 32804. Robert E. Bathen, partner and senior executive engineer, is manager.

Fraioli-Blum-Yesselman, consulting engineers of New York and Norfolk, Va., have opened an office for the practice of structural engineering, 999 Asylum Ave., Hartford 06105.

Geddes Brecher Qualls Cunningham, Architects of Philadelphia have opened an office at 18 Nassau Street, Princeton, N. J.

NEW FIRMS, FIRM CHANGES

Affiliated Architects, Inc. is the new firm of **James R. Franklin** and **Klaus P. Nentwig**, 360 Maclellan Building, Chattanooga 37402. **Marshall A. Hildebrand** architect, is executive director.

Gunnar Birkerts and Associates Inc., architects of Birmingham, Mich., have elected **Gunnar Birkerts, A.I.A.**

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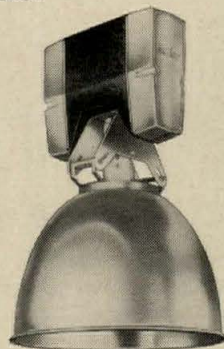
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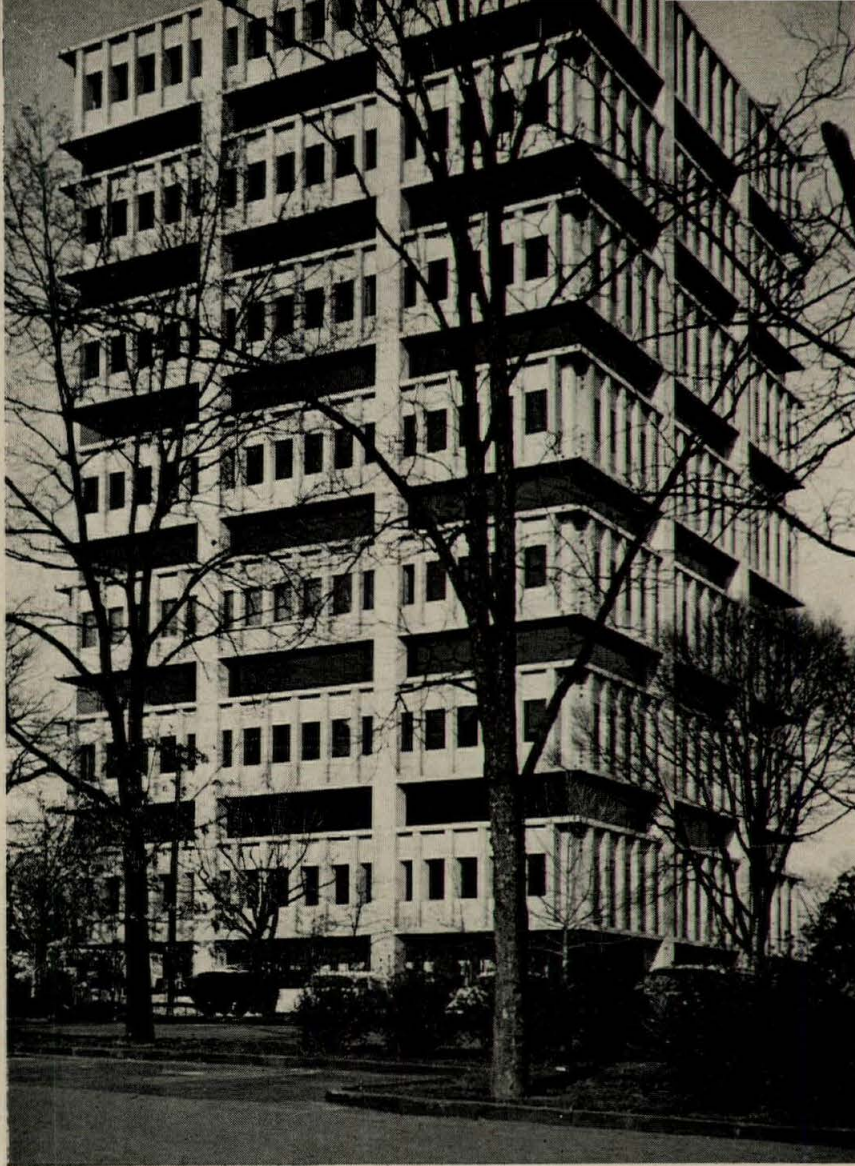


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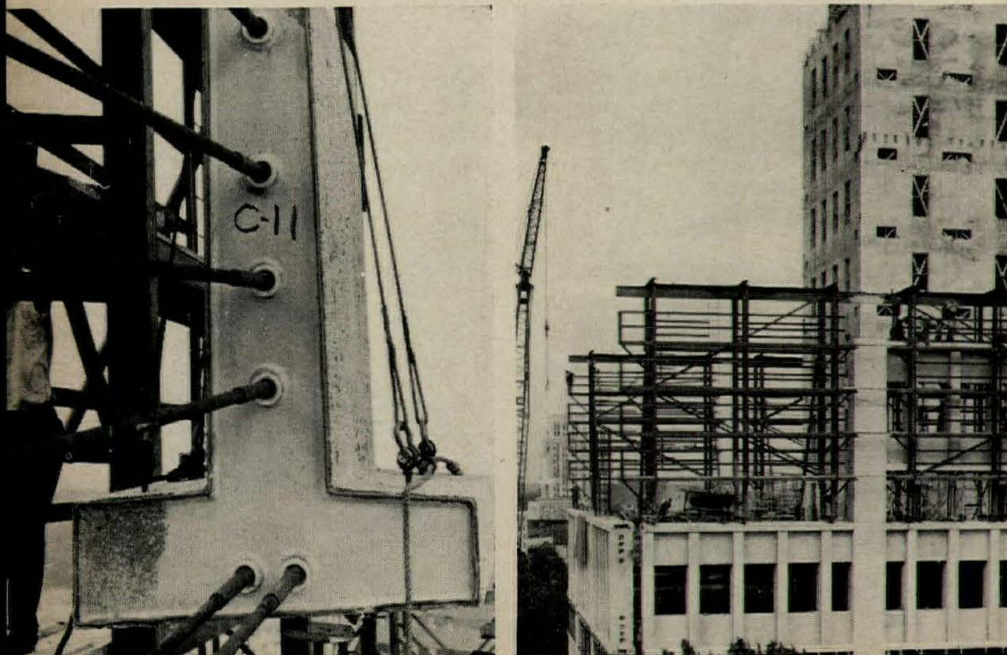
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Below left: Precast top and bottom chords, alternating with vertical members, are threaded into place on the stressing rods. Below right: A temporary monorail conveyor receives the precast units from a crane at a corner of the building, then moves them into position in the truss. Using two monorail systems, the contractor erected two complete floors of four trusses every three weeks.



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LET'S MAKE IT REAL

The teaching process in architecture is inevitably linked to the doing process (doing by both teacher and student), and unless they — teachers, students and processes — are inseparably meshed, we shall have neither creative teachers nor inspired learners. The ideal system might set teachers and students forever in orbit in a kind of perpetual motion... but it is academic to go around in circles about which comes first — the great teacher or the great student. So obviously, we must start with some sort of process or activity that is in itself creative and keeps people lively and stimulated. From such a process will flow a kind of vitality that motivates both teacher and student. Without motivation, education suffers.

Whitehead wrote about "inert" education and suggested that even the classically inert subjects — say Latin and logic — must be brought to life. By this I believe he meant not by sugar-coated pills or classroom acrobatics, but by making learning happen in the entire learning system of the student — mental, nervous, muscular. Dewey and many others knew this empirically, some time ago. Today neurological research confirms this: it shows that the only real learning is experience that changes the learner; and such neural change basically comes from self-generated action or activity or thought.

Last year at Harvard I sensed that most schools of design were back in the fifteenth century — that their ancient work attitudes were symbolized by those traditional tools and accepted equipments of architecture — drafting tables and stools — stools and drafting tables. As a newcomer to the serious tradition of education, I questioned why some schools shouldn't start from the beginning, ponder life's meaning and reinvent architectural education. I proposed a study.

Obstacles to a new approach

During the year we have been investigating ways to connect teaching and doing within the legal framework of our institutions of "learning." As usual, it isn't as easy as it looks. The idea of direct doing brings with it some major conflicts about what a university is or does, and indeed what teaching

By BENJAMIN THOMPSON, *Chairman, Department of Architecture, Harvard University. Thompson, a former partner in The Architects Collaborative has recently opened his own office in Cambridge, Massachusetts. He proposes here a controversial new method for the teaching and doing of architecture. In an important addition, a visual essay "Reflections on Environment" beginning on page 110, Thompson develops a similarly important theme—the search for beauty as an inspiration, and demonstrates once again his central thesis: "We architects," says Thompson, "need the real world as much as the real world needs us."*



really is about. We also seem to threaten our omnipresent stepfather, the architectural profession. For if university-based domestic architects involve themselves in direct, real work within a school, they are competing with private practice. They are said to have unfair advantage...an inexhaustible golden well of free students. Accreditation is a major obstacle. Many people, including Dr. James B. Coquant, have attacked accreditation procedures, objecting to the rigidity and domination of "the establishment." A professional school risks its accreditation-neck in proposing new programs of experimentation and innovation; yet today I expect that the American Institute of Architects itself understands that bold educational action is necessary in its own field.

Architectural education is not intrinsically "inert," but over many centuries of search for respectability, the cold war between schools and the profession has certainly thinned its blood. Architectural schools today, like animals, find themselves impotent, unable to reproduce that hybrid designer who can save our environment and carry out many brave and noble assignments.

Architecture, of all possible things on earth, has by nature

such a wonderful potential for aliveness. It deals with positive things—actual buildings—so that it is concerned with vital needs and issues of our time. Is there any doubt that architects today are no longer the prettifiers and decorators of a polite society, but the builders of the total society at its very core? That is why the shift of emphasis is away from isolated inanimate design—away from the monumental cultural centers occupied by mythical man to the very animated, real buildings of unpredictable, living, breathing man. This total focus has sometimes been called the humanistic approach. But let us not confuse this title with scholasticism, Sir Geoffrey Scott, or even the liberal classicism of the last century—it must have an entirely new, alive meaning for us. The challenge today is that architects must do something more with humanism than pay endless homage to it. As we rediscovered man as the central focus of our design world, we must project live man into our live plans. We can no longer pay lip service to humanism's respectability—knowing that, like motherhood, it is a safe, popular and unattackable cause.

"One-shot" humanism: a failure of method

Educationally, we in the university are faced with this puzzle. We live side by side—planners, architects, landscape architects and urban designers. Across the Harvard Yard are buildings bristling with sociologists and economists, public health experts, lawyers and educators. They're all here—the humanists of the world—but they are not with us, nor we with them. They may come to our juries, as David Riesman sometimes does, or lecture us on historical origins, as Oscar Handlin has done. And they may advise us on the psychological aspects of space. We may develop a very clever program of learned "one-shot" advice: here a planner, there a sociologist, now plug in a plumber. But the peripheral exposing of our classes to "other scholars," and even having coffee with them, is not enough. For somehow, when our students start to design, all that good abstract advice is soon forgotten as quickly as mother's warnings about elbows and forks by small, hungry boys. It is not just a failure of communication or language. It is a failure of method. If you don't believe it, look at the results both in student projects and architects' completed buildings.

Design problems: fake or real

Thus, I have proposed a kind of "research case method" that could be carried out in the university to make dead architectural problems into live concerns, and inert curriculums into active learning situations for students.

Just for fun, let me examine what I call a dead architectural problem: "Design an Island for Thinkers in an agreeable southern sea; provide all necessary facilities for all the elements of affluent leisurely life and advanced scholarly thought."

This problem has no site, no client and no budget. It is unrelated to land, sea, sun, economics or real people. It may sound like a spoof, but it was in fact a classic Beaux Arts problem not so long ago. Present-day architectural schools can't claim to have always done better with our problems, even those garbed in modern American dress. Like the sugar-coated islands for thinkers, our problems become fabrications of the teacher, and indeed they are treated as fabrications by the students. So despite all kinds of conscientious effort at careful curriculum structuring, one-shot input advice, and brilliant jury criticism, the results are first fated and soon hated. They are judged and quickly forgotten by all.

Now let's take a live problem: I propose that live problems are those that grow from the real, too-hot-to-handle, difficult, messy, unsolved conditions around us—problems such that the student can feel their acute need to be solved. Live problems today might be concerned with poverty, slums, segregation, automation, resource conservation, highways, education, urbanization and visual squalor—all widely publicized recently by the President. We are told that in the next 40 years we must rebuild the entire urban United States. We know that in the planning of cities, new housing and urban renewal, civil rights will be of central concern. New social programs are doubling expenditures for education and public health in this country. These are certainly urgent needs. We are aware of the strangling of communities by the ruthless domination of highways. And it is common knowledge that every major river system in the United States is polluted. Need I speak of air pollution? We must have some plan, not only to preserve the beauty of our country, but to design and develop it constructively as it grows. I would like to see teams of teachers and students, architects, planners, sociologists, and

whatever else is needed, actually working on cases that are real and urgent to real communities, projects that are intended to be built, projects supported by those communities.

For instance, an architectural school could undertake a prototype housing project within a city's redevelopment program. It is no longer an original thought that the human side of housing is not being solved, either by public agencies or private companies. But how do we give a large-scale project the rich variety of a real community or city? We have stacks of books criticizing the visual squalor, bad economics, surface sociology, lack of privacy, poor design. The nature of the problem has been identified. But criticism is just the beginning: the harder part comes in finding the courage and the means to act; and harder yet, to make responsible action the role and means of educating our students.

For the real problems: who has some answers?

Let us ask: What does it take to make a better physical world come about? Surely we are over the naive notion that it takes just a good sensitive designer drawing things up in a neat, orderly, well-proportioned way. We know that it takes tough lawyers, imaginative economists, bold engineers, not to mention forward-looking politicians who know their way around city hall, to get something into bricks and mortar after we know what is wanted. In all large-scale projects, I sense too limited imaginations and too little support. We thread our way through a maze of codes and laws and limitations. Assumed inviolate, they become self-defeating. We translate this defeat into a progressively more isolated, self-protective teaching method that keeps our students from knowing the truth or how to deal with it.

What happens if we start the process at the other end? Don't we by now know about what a better society could be, so that a working university team could define it, then design it, and finally build a real prototype? Let the government commission us to build the central part of a new town. On second thought, let's build the whole town—say for a population of 25,000 on the edge of the city. Look at the new towns on the outskirts of Stockholm and in Finland. It can be done. I insist on real building for two reasons: first, I sense that visible prototypes and full-scale models are

the only way to convince future developers of what is possible, and second, because I know that only in the realization does education become the real life activity that penetrates and changes the learner's outlook.

There are so many important tasks to be done that our schools could do. What about rivers like the Charles, flowing through the heart of this community? It is still a beautiful river—proving how stubbornly nature resists desecration. But each hour the river is more ruthlessly spoiled by man's pillage of its natural banks and wholesale usurpation by widening highways. We need a comprehensive plan for the river rather than splinter groups picking away at the splintering carcass. Should the University sit on the eroding, sinking bank, dreaming up "islands for thinkers," when the arteries of its own community are hardening daily?

By now you may be poised to ask the killer question: How can "case" action education be allowed or supported? Case studies could be managed by grants from foundations, industry, government, private groups, etc. Prototype building should be supported by government agencies and then industry. I am prepared to say I don't know further how to do it beyond the clear fact that it can be done if we want it. And I am prepared to say we must want it, if we imagine our schools to have any further meaning . . . We need the real world as much as the real world needs us. And I am also willing to add that such a step is harder than anything architectural schools have tried yet. Which reminds me what someone said about John Dewey's ideas: "He was not tried and found wanting; he was found difficult and not tried." We must try the difficult. We must put our students to work on the living, breathing scene.

The impact of this simple notion—a kind of case system, if you will—could bring the needed transfusion to revitalize design education. It is conceived as a framework for teaching all the design, all the structural and environmental aspects that we need—and teaching them so they stick. It is also a way of escaping the paperbound, blueprint-minded aura of the studio . . . to teach our students to make meaningful decisions and to stand by them . . . in short, to teach them to take the responsibility that comes of knowing they too belong to the human race.

REFLECTIONS ON ENVIRONMENT

"Architecture, of all possible things on earth, has by nature such a wonderful potential for aliveness."

The photographs opposite and on the following pages were made under Benjamin Thompson's direction.

When morning comes to the great marsh,
I view the vast landscape.
Before my door, mysterious forest islands
float like ghostly ships
at anchor upon a solitary straw-colored sea.
The flat grass ocean is underlaid with soft grasses,
then penetrated with purple beds of sea lavender, reeds,
and a thousand matted rushes.
Now the air sweeps across the salt marsh,
brushing back and forth with the wandering hand
of a sky-bound giant, painting a continuous pattern on the flats
And the tide water flows into the deep mud ditches,
floods out the standing tidal ponds.
Seabirds flushed from their hidden feeding places
fly screaming out
and tiny silver fish
flash from the trapped water pools away to safety.
Hermit crabs scuttle deeper into their dark holes.

Somewhere in this teeming mud-grass world
a billion or so years ago, an odd collection
of fish, frogs, grasses, and waters met.
They stirred the marsh oozes and generated new recipes
for the life cycle of our planet.
As I watch the great marsh,
I speculate about the energizing forces at work out there —
at the fantastic systems of structures in nature,
the surging energy of growth and instinct.
The development process is an incessant journey,
and since nature formed man's beginning,
should it not now serve as man's guide?

But as designers, do we relate
nature's constant motion to our own man-made work?
Or do we plan fixed systems of buildings
for fixed moments of time?
What about the coming of morning, of noon and night?
What about the incredible evolutions
caused by the sequence of hot-cold, wet-dry?
What about man's growth from birth through old age?

Today the harsh noises of acceleration ring out.
Even now at the marsh edge
I can hear bulldozers
munching hungrily at the beautiful countryside.
We are warned that in the next forty years
more building will be done
than during all the years since the Pilgrims.
That sounds like a neat statistic;
so neat I don't know what to do with it.
Who invented the figure of forty years?
What does forty times more building mean?
At any rate, with such an incredible crisis on the doorstep,
should we architects continue
by fifteenth century methods
of ancient drafting boards and stools,
old questions and tired answers?
What should the designer's role be
in this new age of accelerated insanity?
Will he care deeply enough
about the interrelated roots of his muddy beginnings
not to squander, but to preserve, the precious habitat?



"Design is concerned with a sympathetic attitude: a desire to save, to build, to regenerate, to not spoil what is already there."

Design is a process connecting man, nature, and society:
it is continuous —
no single man constructs an entire environment
and, hopefully,
no single man will end the process forever.
Man-made environment is handed down
from generation to generation —
it grows in harmony
only if those who work on it show respect.
Herbert Read wrote that
"the act of constructing cooperatively
is the groundwork of a peaceful community."
Yet no tradition of community architecture
has developed today.

Can we create in our own time an architecture
alive with the harmony, tranquility, and repose
of the lovely New England greens — I wonder.
Today's version of "simplicity" and "honesty"
would not be the primitive stuff
of early colonial villages
populated by unsophisticated folk.
Nor would simplicity
derive from 1920's primers
of geometric forms following dubious functions.
True simplicity comes
at the end of an exploration of complexity,
from a concise summing up
of all that really needs to be said.

To my mind no good contemporary solution
is a simple spontaneous act —
those Greeks with their delightful villages
were simpler in living
by two thousand years.
And while there may be action painting,
I see no action architecture
without the greatest discipline, control, and education.
In the end won't the demand
for greater internal discipline
leave us with more freedom
to search for appropriate expression
outside the passing style parade?

Our generation has been frightened
by the word anonymity,
which we equate with conformity.
Certainly harmony will only come
if egotism and upstage-itus are overcome,
leaving designers the confident self-assurance
to plan for humans other than themselves.
The importance and lure of the New England green
is not alone the elegant white houses around the edge,
or the smooth rich grass between them.
It is the sum total —
a social concept of all the human things
that happen there.
The village green had unity and diversity,
held together by a common theme.
And when we find the common themes of our own times,
we will create
a significant civilized new architecture.



"We must project live man
into our live plans."

Imagine that light is a living thing,
warming the face of the earth,
and that beauty belongs to a girl
and a bowl of yellow daisies.

Remember as children our easy innocence
when alive with the new ability to see
we devoured with fresh eyes
a many-faceted world.

Our unfettered imaginations
explored the mysterious corners
of small-scaled universes,
followed the paths of radiant lights
and joyous colors.

Harmony among many things
was so apparent then—
We had frogs as friends.
Our hearts were ever open
to continued discovery and surprise.

Growing older we surrendered to the tyranny of age;
we lost the child's inborn ability
to look with wondrous eyes.
And today the overpowering march of urbanization
further distills the spirit,
prevents direct contact with the physical world
of our initial inspiration.

Might we be sentenced some day
to a bleak gray petrified environment
shut in with mono-colors, filtered airs,
and controlled sounds?
Then the over-civilized senses
would no longer connect to the world around
and we would have no moments of discovery,
no wonder as our constant companion.

Our contemporary world
is not a place of pale human beings,
but one of health, joy, and color.
I consider that human life is something to be lived
and that one should not waste his time
with gray existence.
So the architect's place on this planet
is to create that special environment
for life to be lived to its fullest—
dedicated to the brilliance of this glowing, orbiting world
and its magic moments.

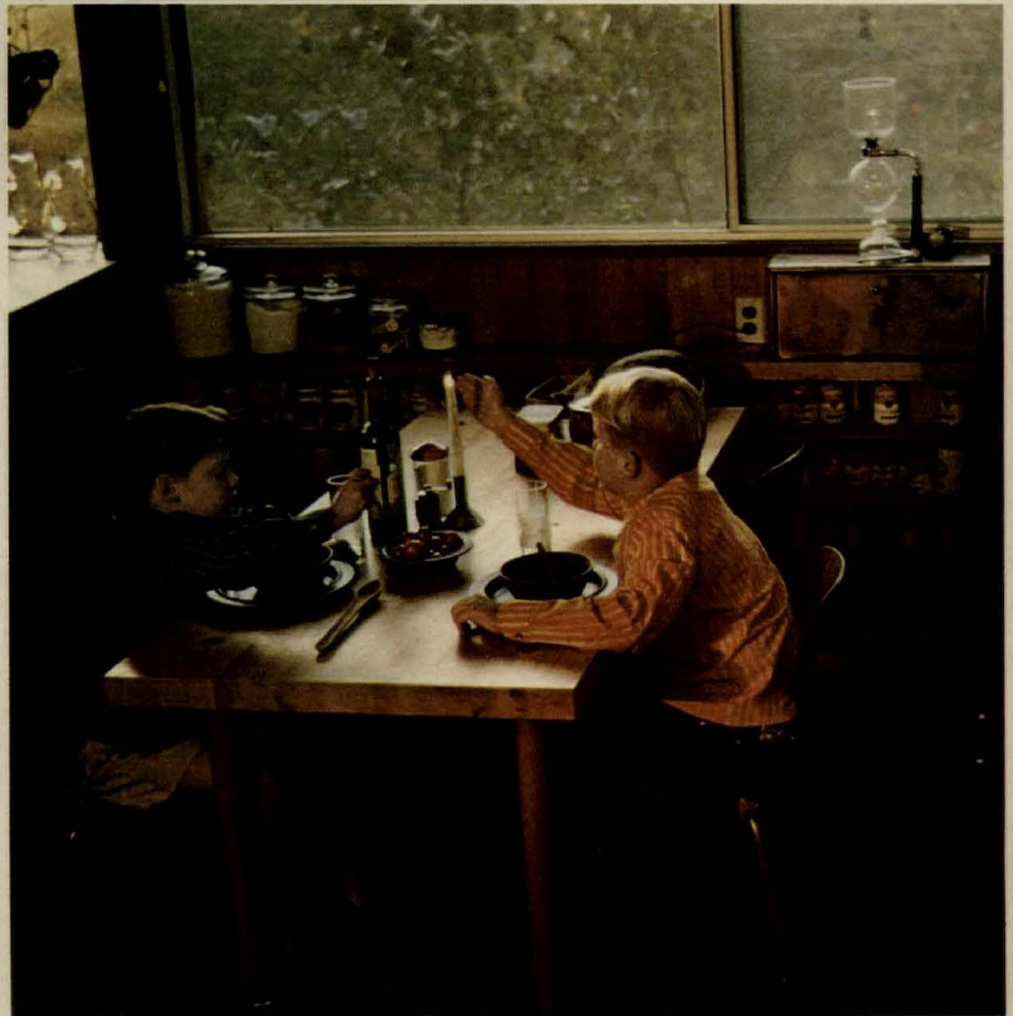
Art happens at every level and in every corner,
once we become aware how to look.
There can be art
in the cooking of the meal
and the event of dining itself.
Imagine cooks as philosophers and shoemakers as artists.
Art can happen in a natural way
from what comes naturally in our daily lives.
Once the process of work has begun,
art no longer exists as "Art,"
but assumes identity with its surroundings.
And where the artist-in-us
is submerged in a purpose—
then action can be beautiful.





"Art happens at every level
and in every corner,
once we become aware
how to look."





"Harmony is established
through the surroundings, by actions,
both natural and man-made
through sympathy with the scale
of spaces and materials."

Light comes to architecture traveling over fields and walls,
climbing the sides of buildings, piercing the hollow voids,
sunlighting the edges, penetrating the inner space.
And floors and walls and ceilings
come alive as light brings constant change of mood and view.
Light really embraces the form and shape of architecture.
Doesn't light's moving path reflect our own constant search,
our changing moods, our personal ups and downs?

In architecture we tend to see our solutions as permanent —
we build eternal monuments to our own egos.
Let us forget the 45-degree "cast-shadow" approach,
which imagines things in a mechanically frozen position.
How tragic that joy cannot be fixed forever — yet how fortunate

Then if architecture is an unending process,
it means that each building must find its place
on a natural ladder of importance
through use, location, and the reality of people.
Harmony is established
through the surroundings, by actions, both natural and manmade
through sympathy with the scale of spaces and materials —
harmony that will make the old look better and reinforce the new
the concern for all things.

Architecture has always been the handwriting of the times,
the reflection of society.
Thus architecture of our era could reflect
an aspiration for a good society
if we could only determine what that good society should be.
We know that nothing exists today in mountain-top isolation,
we want society to grow more and more together
toward a balanced organism of rich variety.

Architecture then is a segment of life, always connected to people
and buildings exist, not in solitary confinement,
but as connections to their age.
Housing developments could become no longer drab,
middle-income, low-cost or old-age projects.
Unsegregated by economic, racial, or age groups,
they could be living places
containing the mixture and the multi-functions of all people.
Why should not the hospital be a vital part as well —
not a lonely ghetto, but a life-giving symbol.
We foresee the demise of dry governmental centers
and separate cultural institutions.
We predict the rebirth of the balanced city.

The new architect coordinates
the design of the environment,
he directs engineers, planners, economists, and consultants,
combining total processes and experiences into a total solution.
Since architecture reflects man's role in society,
the new architect of our time must understand man;
thus he needs knowledge of sociology, psychology, anthropology
and concern with the processes of government and law.
As the coordinator who will synthesize and harmonize the system,
he must ultimately be prepared to build the total city itself.

The happy thing is that the function of the architect is to build,
that architecture is an action process, not a profession.
Let us find pleasure in the action.





CREDITS:

Architects and Buildings

p. 113 Boylston Hall,
Harvard University. Remodelled by
The Architects Collaborative, Inc.;
Benjamin Thompson, Partner-in-Charge.

p. 119 Top: Thomas M. Evans
Science Building, Phillips Academy,
Andover, Massachusetts.
Bottom: Academic Quadrangle
(Shiffman Humanities Center,
Olin-Sang American Civilization Center,
and Golding Judaic Center),
Brandeis University,
Waltham, Massachusetts.
The Architects Collaborative, Inc.;
Benjamin Thompson, Partner-in-Charge;
William Le Messurier, Structural Engineer
Members of
The Architects Collaborative, Inc.
who worked as Project Architects on
both the Andover Building and
the Brandeis Quadrangle were
Terry Rankin, Thomas Green and
Joseph Maybank. Timothy Anderson,
Visvaldis Paukulis and Sherry Proctor
were Project Architects for Andover;
Lawrence Garvin was Project Architect
for Brandeis.

p. 120 Greylock Residential Houses,
Williams College,
Williamstown, Massachusetts.
The Architects Collaborative, Inc.;
Benjamin Thompson, Partner-in-Charge;
William Le Messurier, Structural Engineer
Thomas Green, Joseph Maybank,
Allen Chapman, Project Architects.

Photographers

p. 111 Charles Hauser

p. 113 Robert Bier

p. 115 John McWilliams

p. 116 Left: John McWilliams
Right top: Julian Brown

p. 117 Left top: John McWilliams
Left middle: Charles Hauser
Right top: David Franklin
Right middle: David Franklin
Right bottom: Charles Hauser

p. 119 ©Ezra Stoller

p. 120 Peter Holmes

ARCHITECTURAL DETAILS

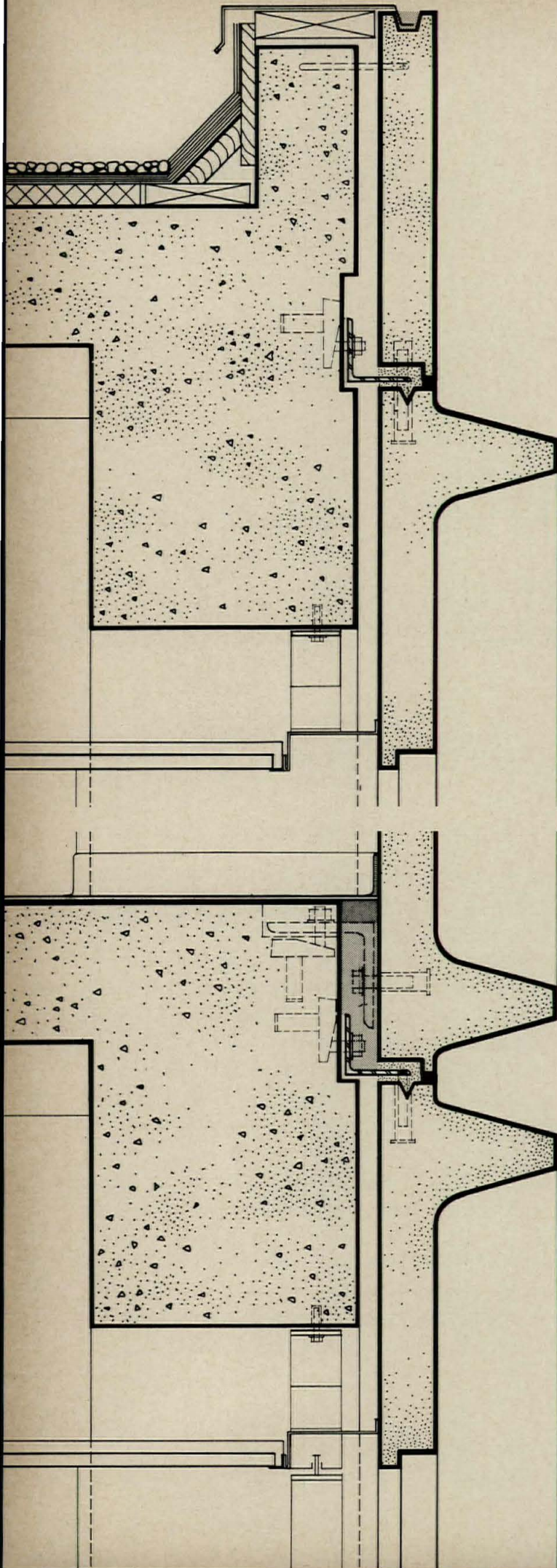
ELIOT NOYES

I think of details in two senses. There are first the details of joints, connections, the attachment of different materials to each other, the turning of corners, the physical relating of parts of the building to each other. But I also think of larger special elements as details—such things as stairs and fireplaces—in which there are of course numerous details in the other sense. In each case the architect has a useful and expressive architectural device. In a way, such architectural details are the architecture, but details alone—no matter how well thought out or how consistent—cannot make architecture. Such details must play their part in relation to the over-all concept and character of the building, and are the means by which the architect may underline his main idea, reinforce it, echo it, intensify or dramatize it.

I like details of both sorts to be simple, practical, efficient, articulate, appropriate, neat, handsome, and contributory to the clarity of all relationships.

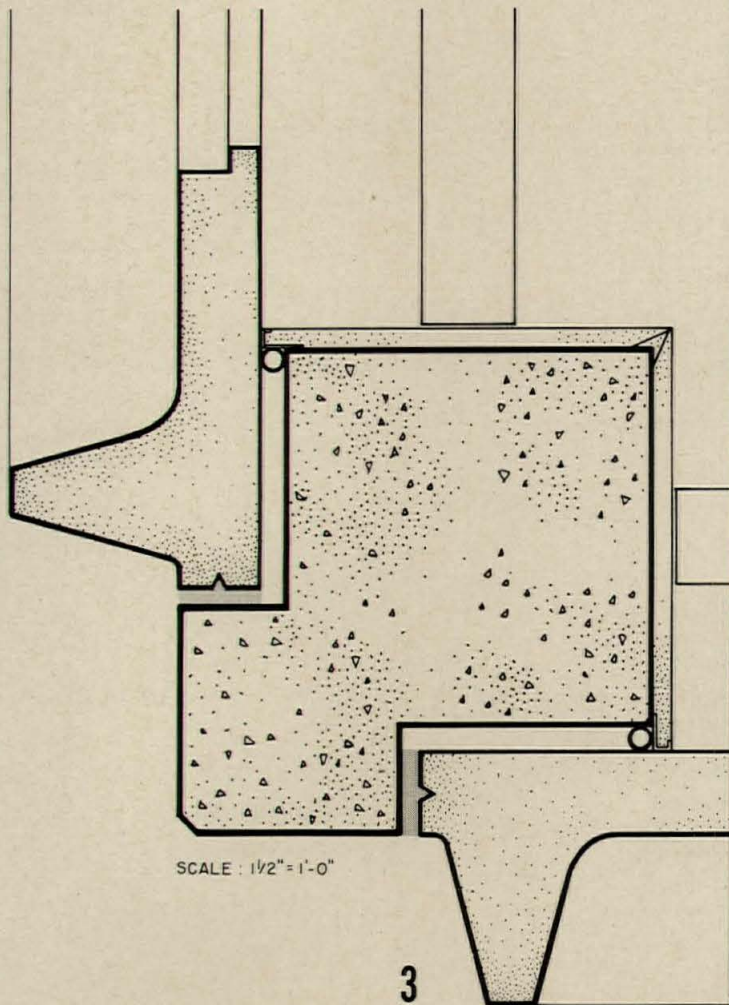
The converse of this is that the spectator may observe and enjoy details, and find in them an extension of his experience and understanding of the architecture. In them he should be able to read, or at least see reflected, the character and spirit of the entire building—as to see the universe in a grain of sand.

Eliot Noyes



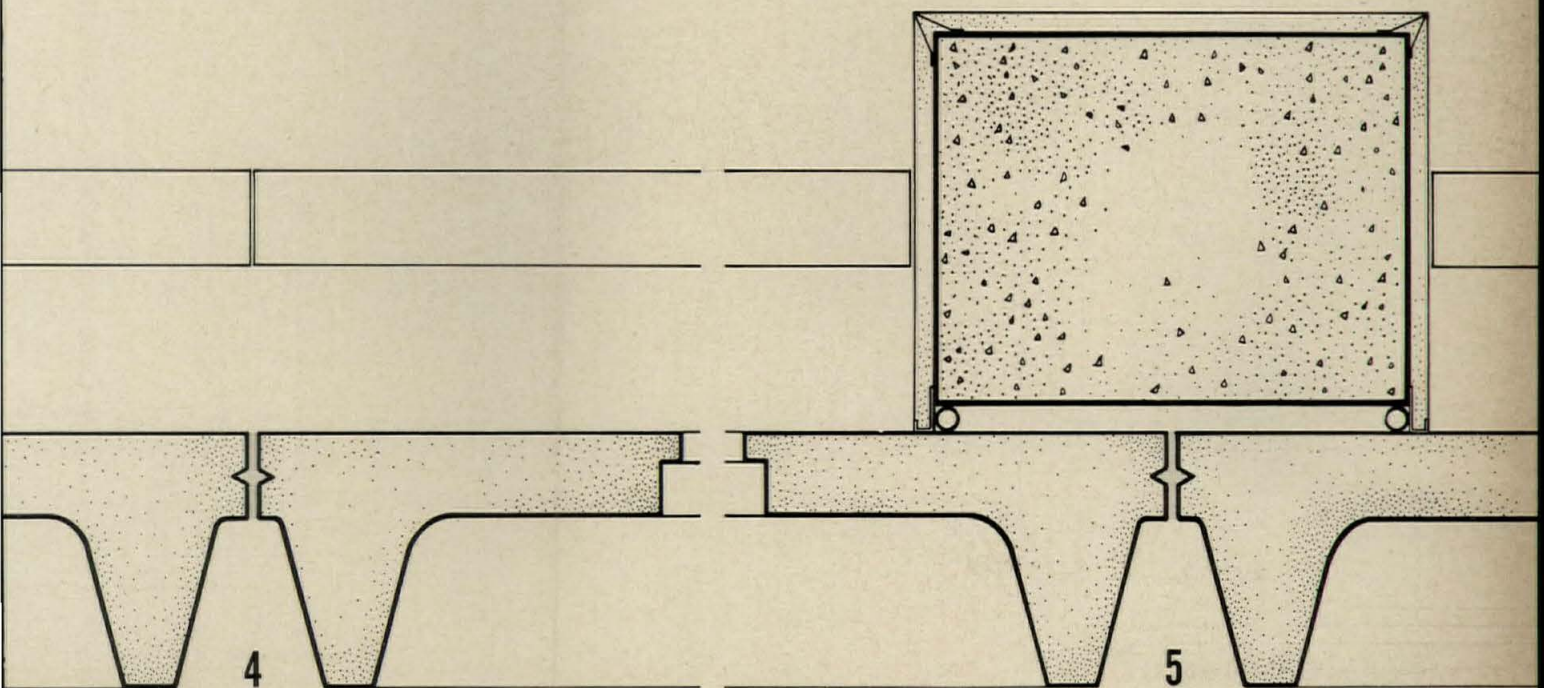
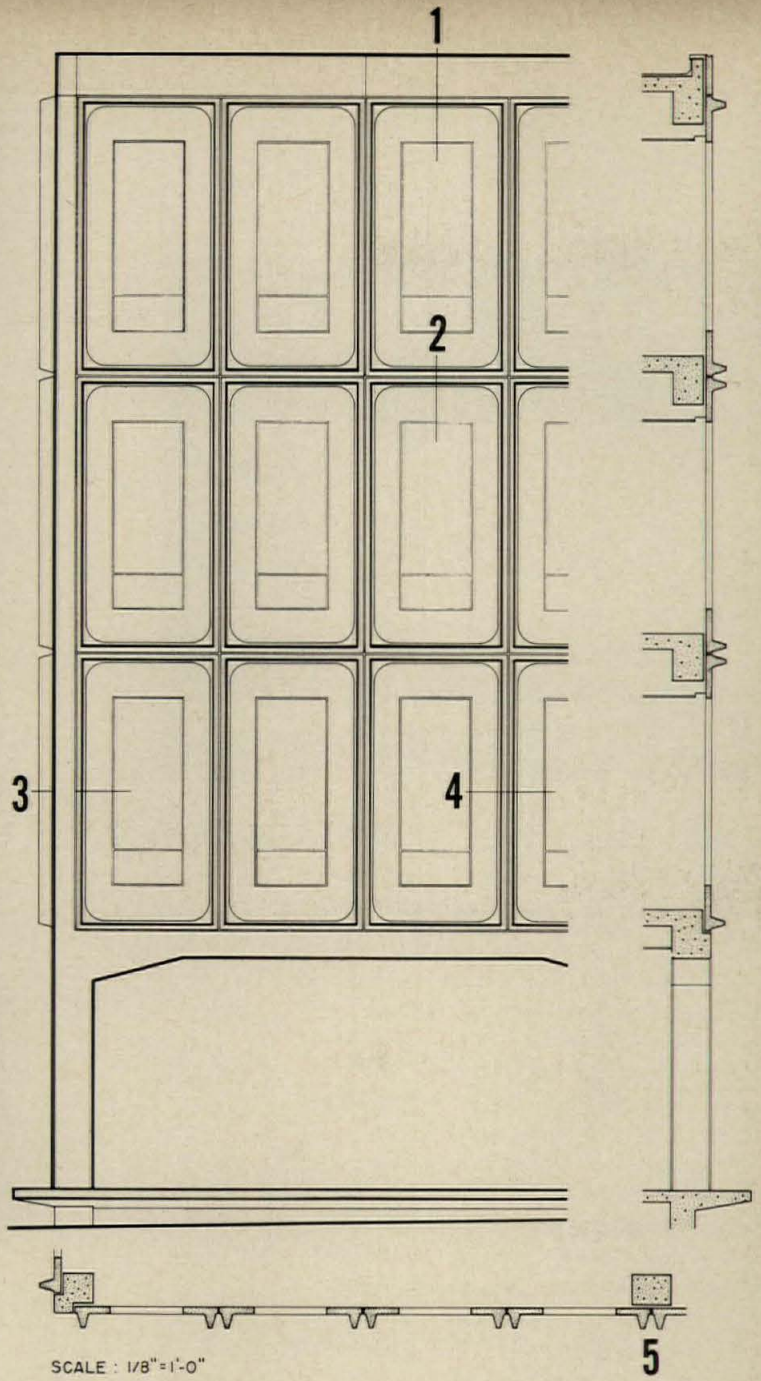
IBM BRANCH OFFICE ARLINGTON, VIRGINIA, 1964

Noyes: This building has a reinforced concrete frame, upon which are hung prefabricated concrete modular wall panels of two types: one with a window, the other blank. The exterior of the panels was designed to build strength and lightness into the unit and to provide an articulated over-all building surface of light and shadow. The joints between the panels occur within the deep recesses formed by the closely spaced flanges. The windows are anodized aluminum, installed in the panels after the wall is erected.

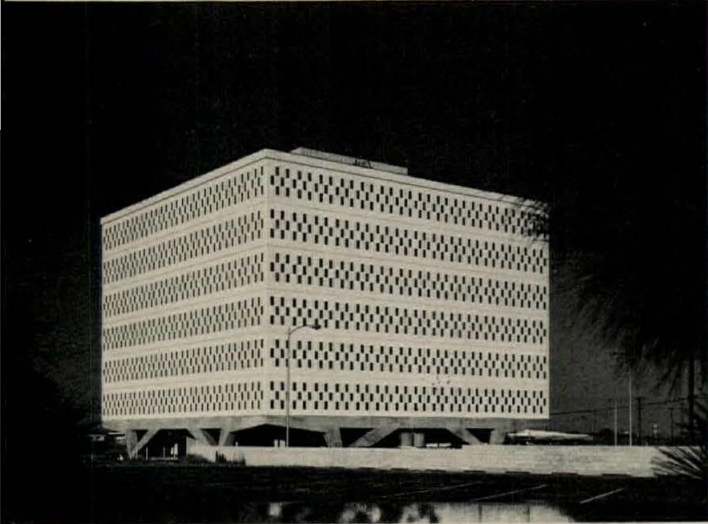




Malcolm Smith



Amir Farr photos

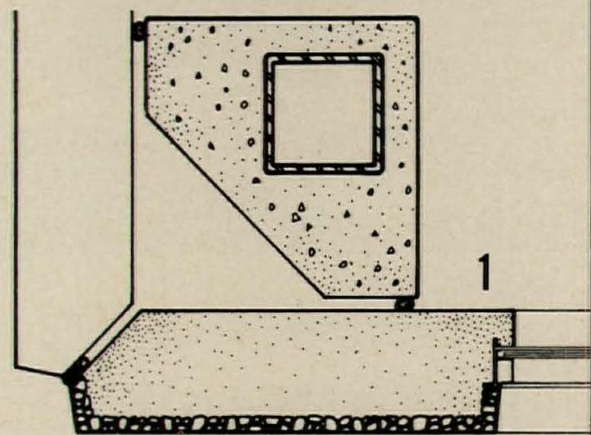
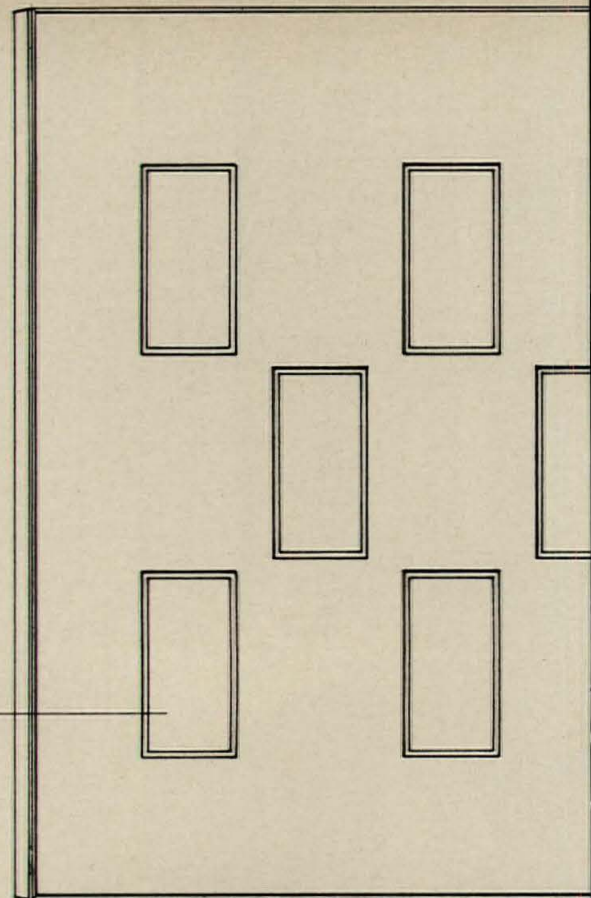


IBM AEROSPACE HEADQUARTERS LOS ANGELES, 1964

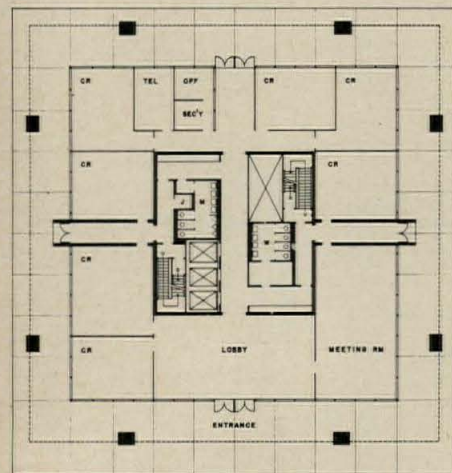
Noyes: The details of both structure and exterior walls grew from a study of two main considerations. One was the achievement of sun-control without draperies or blinds; the other was the use of large prefabricated concrete wall elements as a way of building. Their size was determined by efficiency in manufacture, trucking to the site, and erection. The completed wall is an even mix of wall and window, essentially a screen.

The massive supporting structure derives its form from an engineering analysis of how to provide the maximum open area at ground level. There are eight points of support; a more conventional system would have required 20.

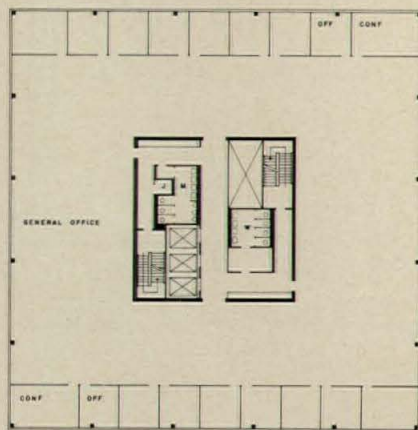
Associate architects: *A. Quincy Jones & Frederick Emmons.*



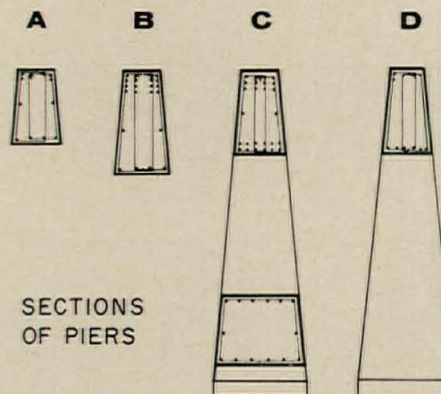
SCALE: 1/2" = 1'-0"



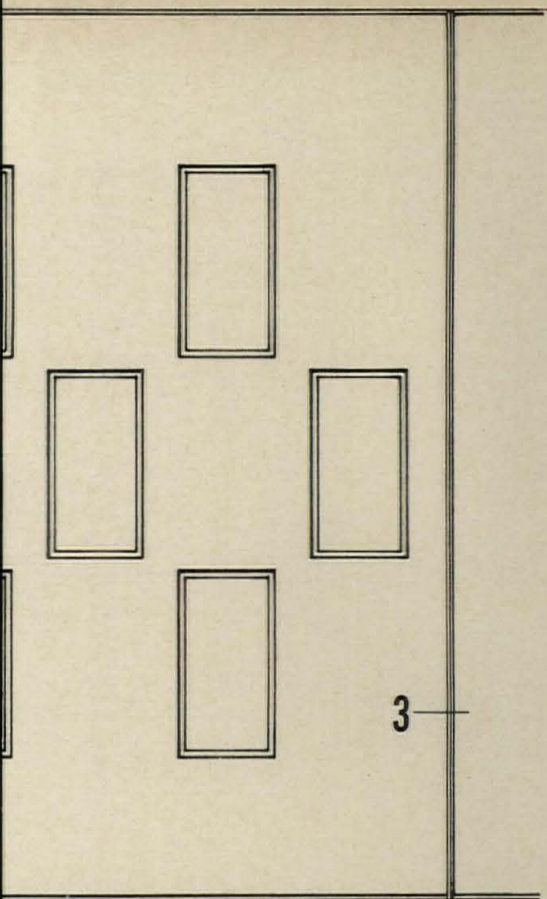
GROUND FLOOR



TYPICAL FLOOR



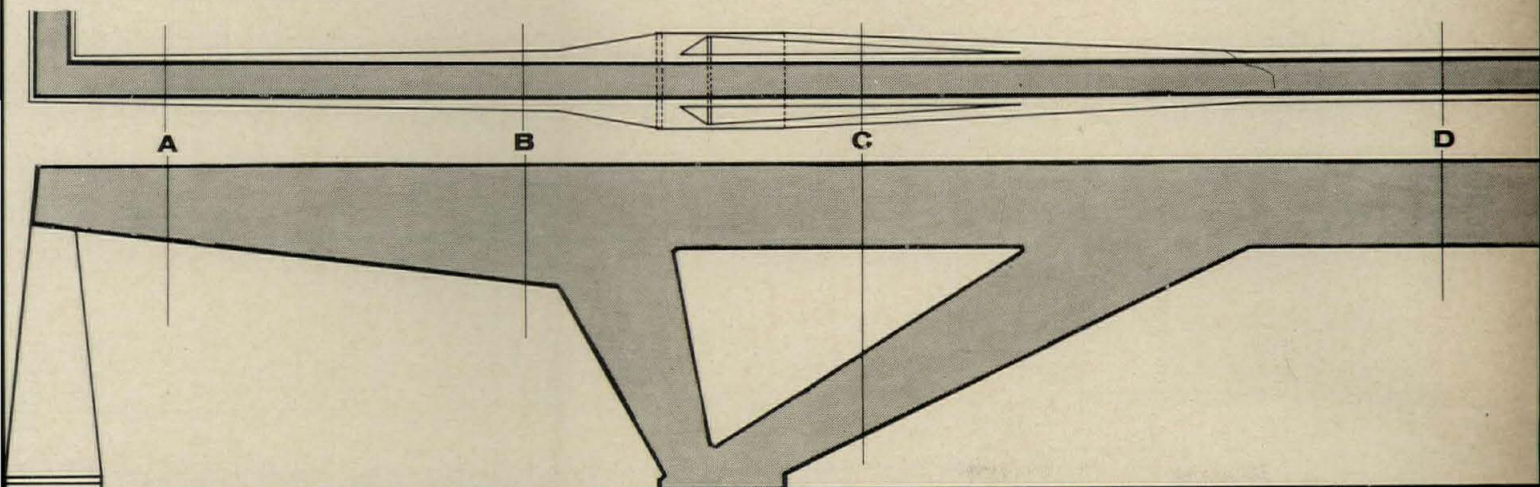
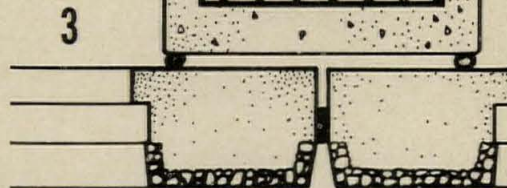
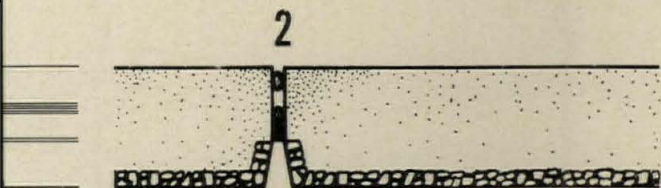
SECTIONS OF PIERS



SCALE: 3/8" = 1'-0"

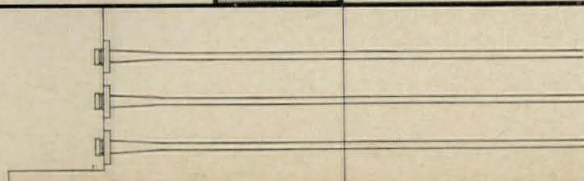


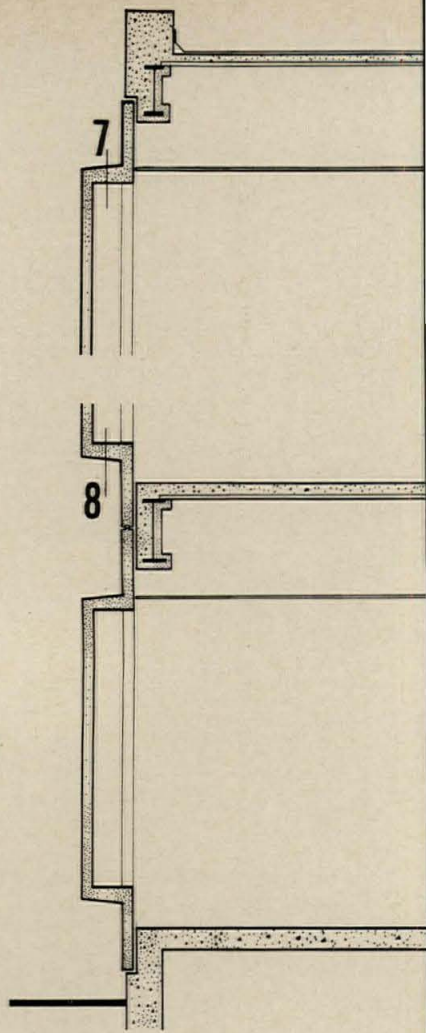
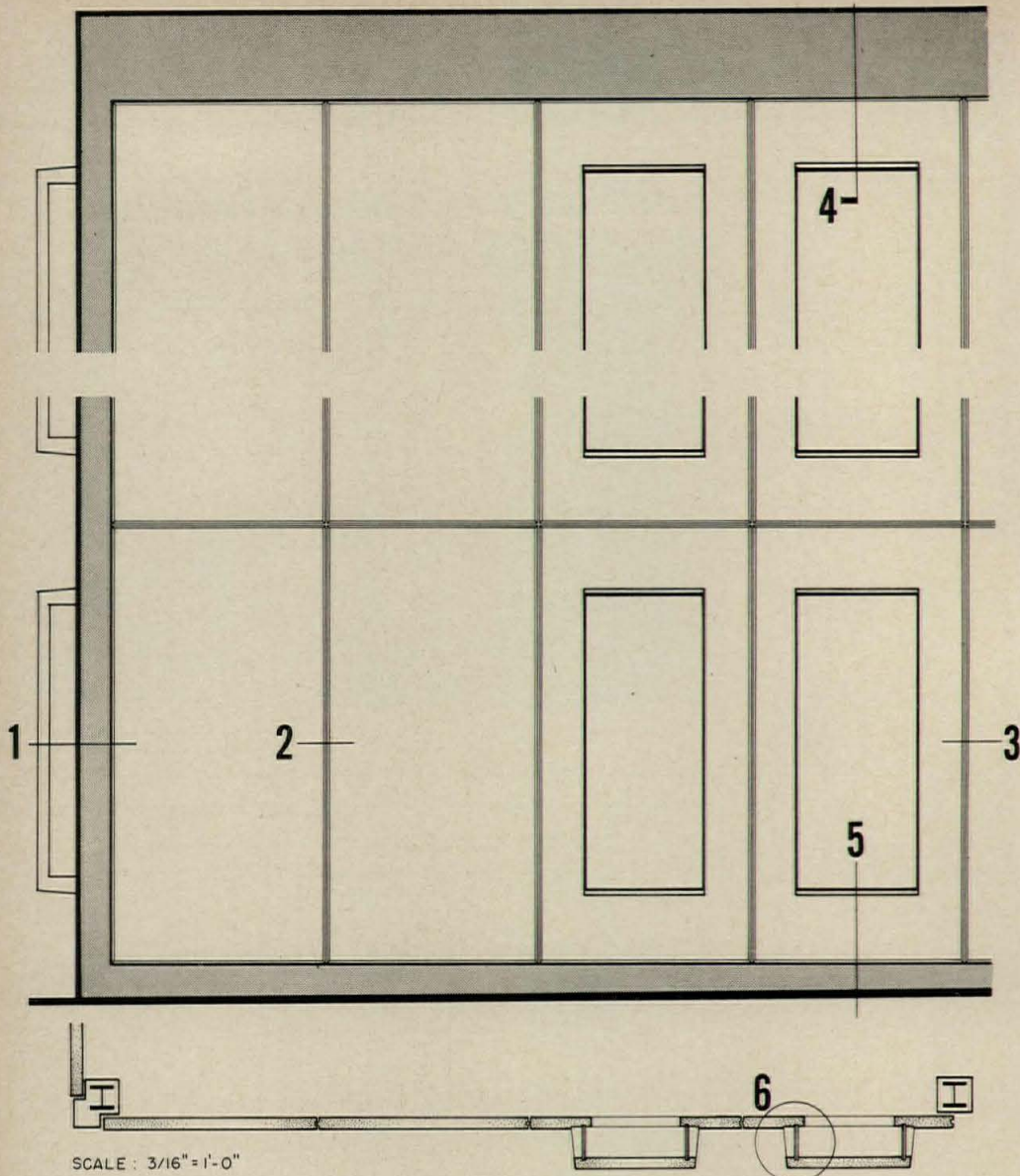
SECTION



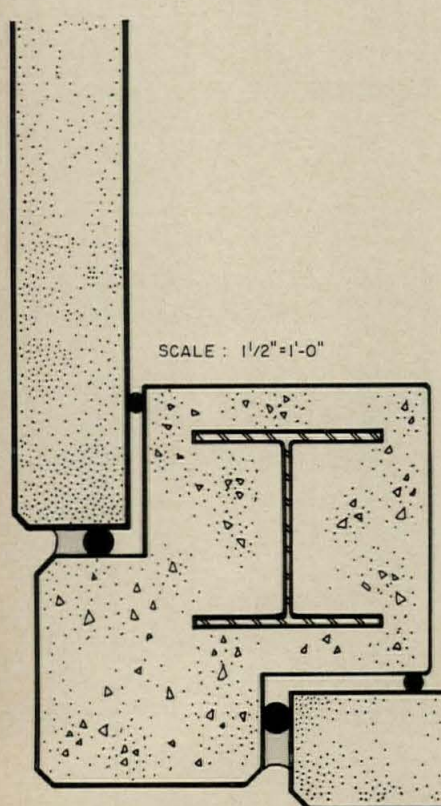
ELEVATION OF PIERS

SCALE: 1/8" = 1'-0"

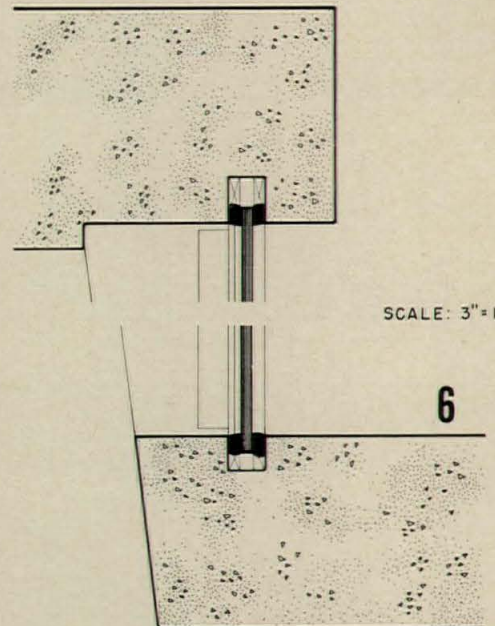




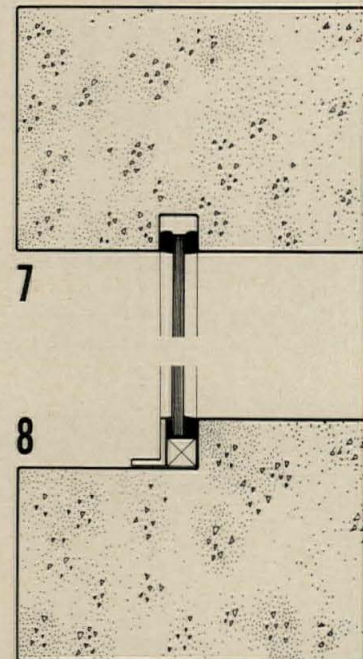
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SCALE: 1/2" = 1'-0"



SCALE: 3" = 1'-0"



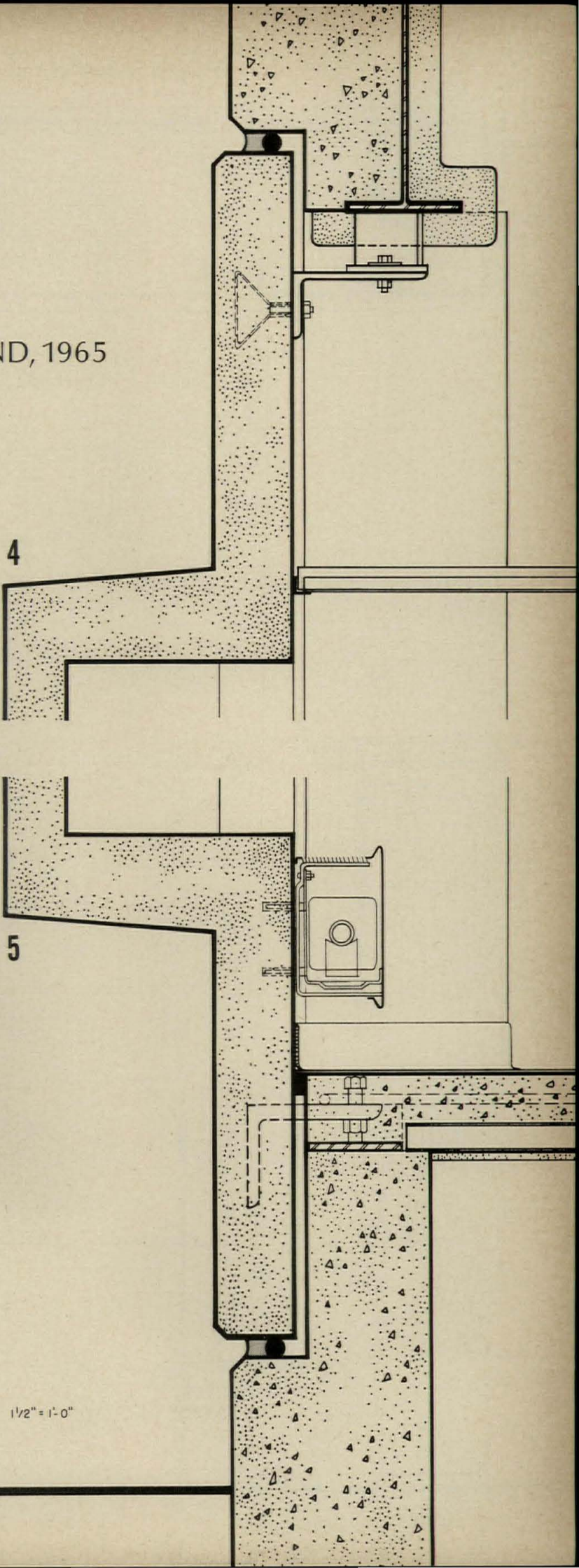
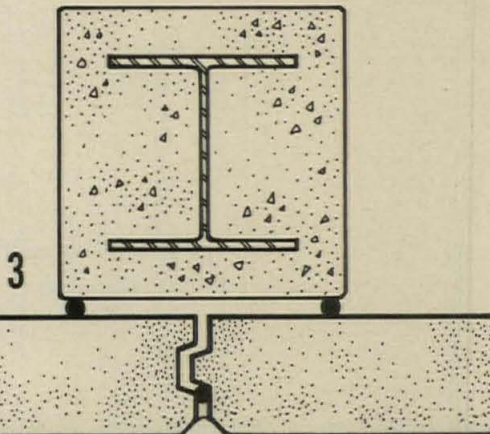
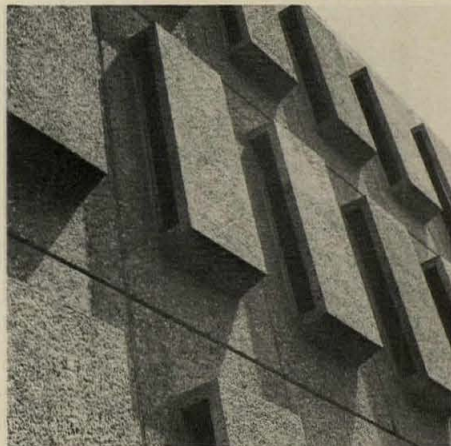
Eliot Noyes



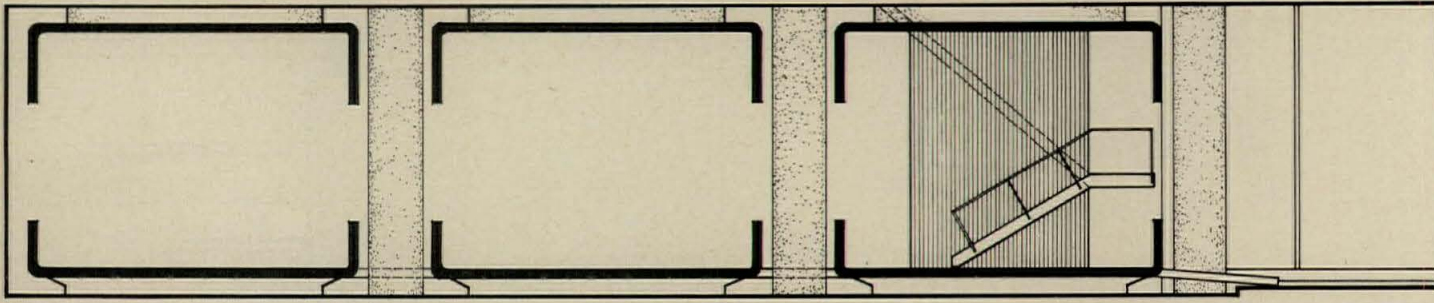
IBM BRANCH OFFICE GARDEN CITY, LONG ISLAND, 1965

Noyes: The details of the walls on this building are a variant of those developed for the Aerospace Center (page 124), and grew from similar considerations. Here, the panels which form the walls were precast in one piece and detailed to eliminate all windows parallel with the surface of the building. Each panel has two narrow glazed areas perpendicular to the building wall and the protruding solid portion of the panel. This permits light to penetrate the building wall in limited amounts and at an angle without the need for additional sun control devices. This also gives the occupants a variety of views from the interior. The details were developed to provide direct glazing of the panels without metal window frames. Where no windows are needed, flat panels are installed. Panels are gray concrete.

Gordon Sutton

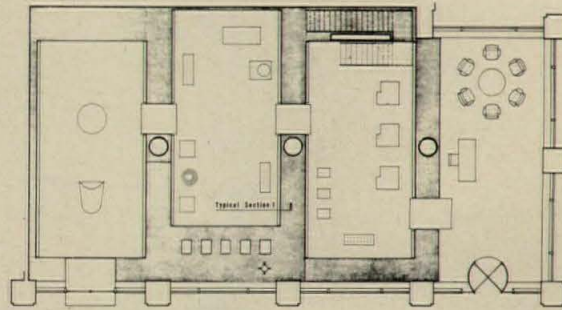


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SCALE: $\frac{3}{32}'' = 1'-0''$

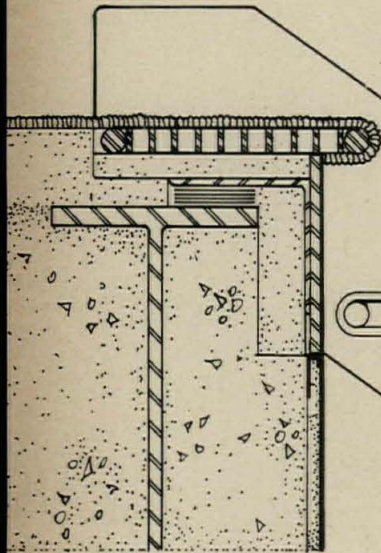
XEROX SHOWROOM, NEW YORK CITY, 1965



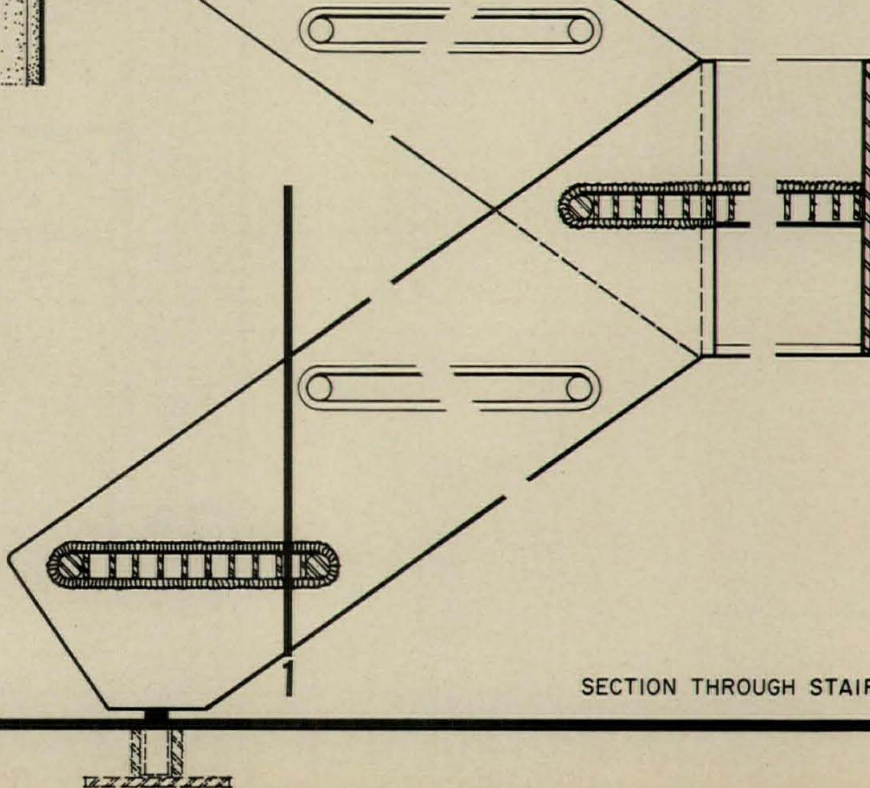
SCALE: $\frac{1}{32}'' = 1'-0''$

Noyes: This showroom is divided into areas for product display by a series of raised platforms with integral railings. Overhead are matching ceiling structures containing high-intensity lighting and acoustic baffling. The upper surfaces above are treated with acoustic plaster; those below with smooth white terrazzo. Air conditioning is supplied to the room through slots along the edges of the platforms and exhausted through the lighting fixtures in the ceiling. All these surfaces are white, against the charcoal floor and walls of the entire space.

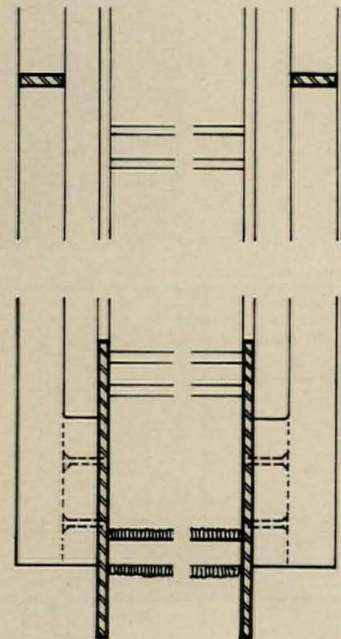
The body of the stair, connecting the showroom with offices above, is made entirely of stainless steel with welded joints. The stringers are $\frac{1}{2}$ -inch-thick plate stock and the railings are solid bar stock. Treads and landing are one-inch-thick grating mechanically fastened to the stringers, and wrapped with carpeting which is stitched along the underside. The entire stair assembly is supported from a flat pier framed in steel and sheathed in aluminum.



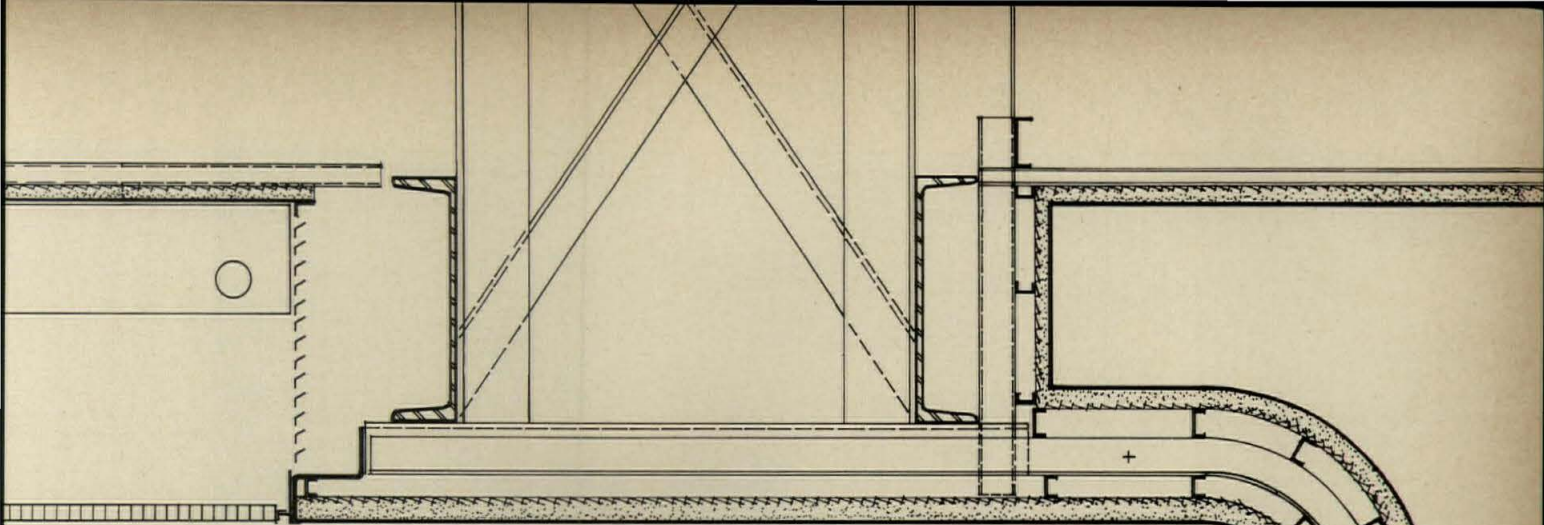
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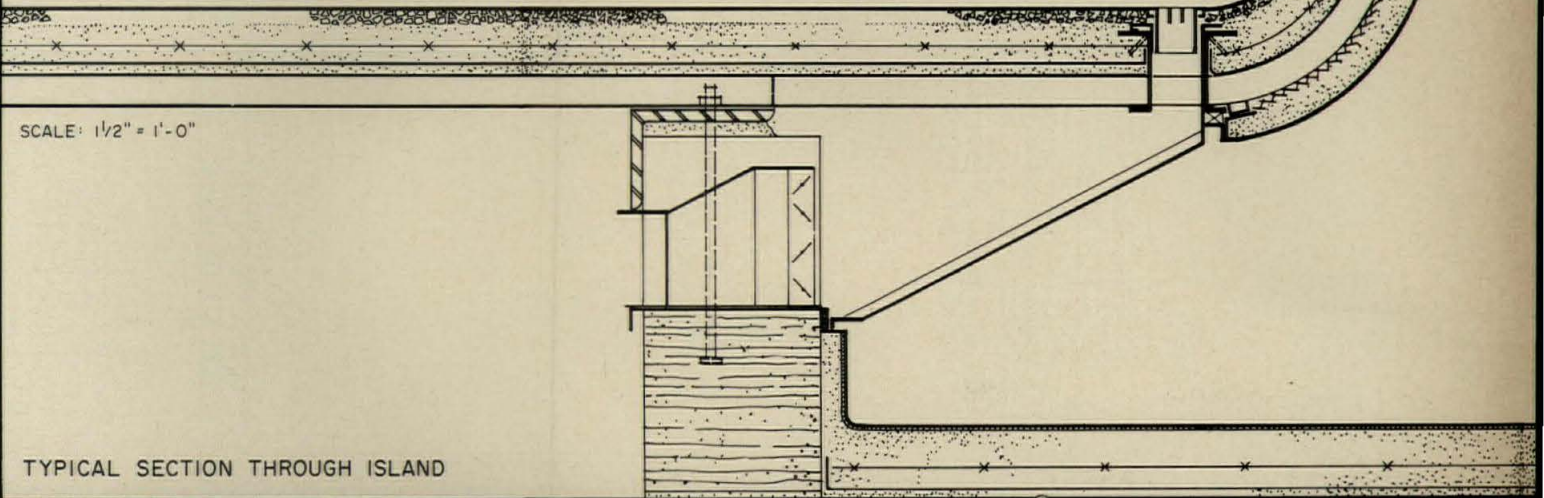
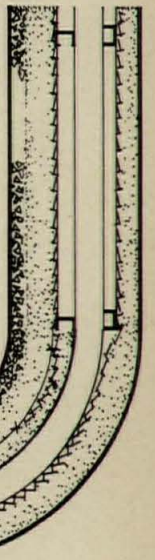
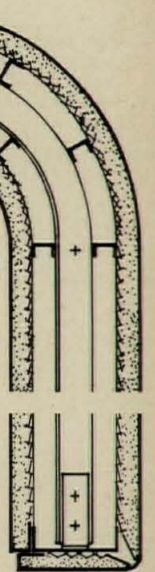
SECTION THROUGH STAIR



1



Ezra Stoller Associates



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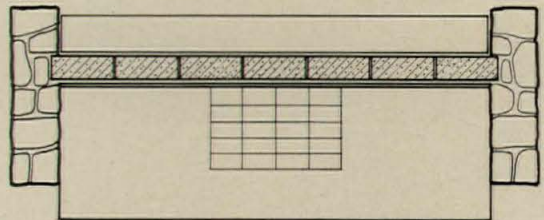
TYPICAL SECTION THROUGH ISLAND



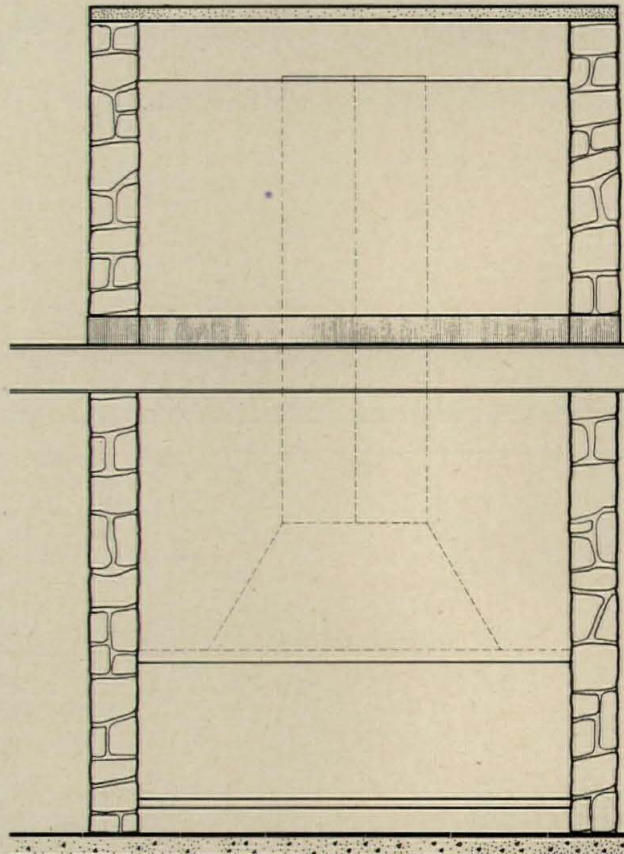
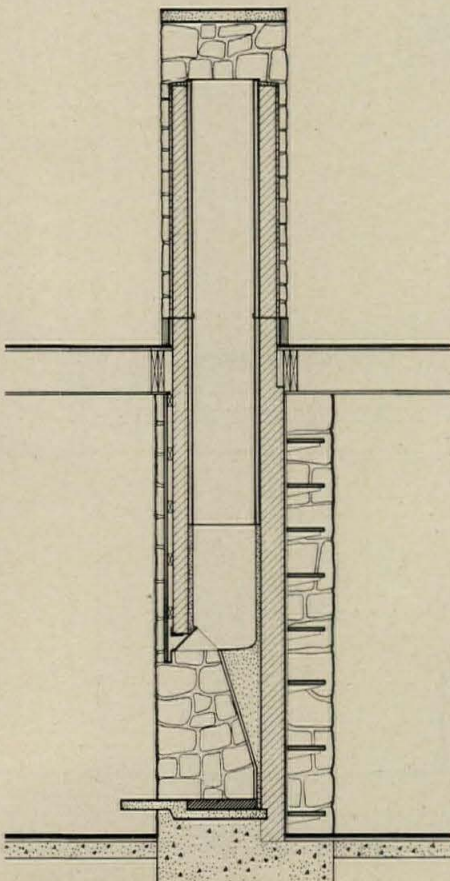
Eliot Noyes

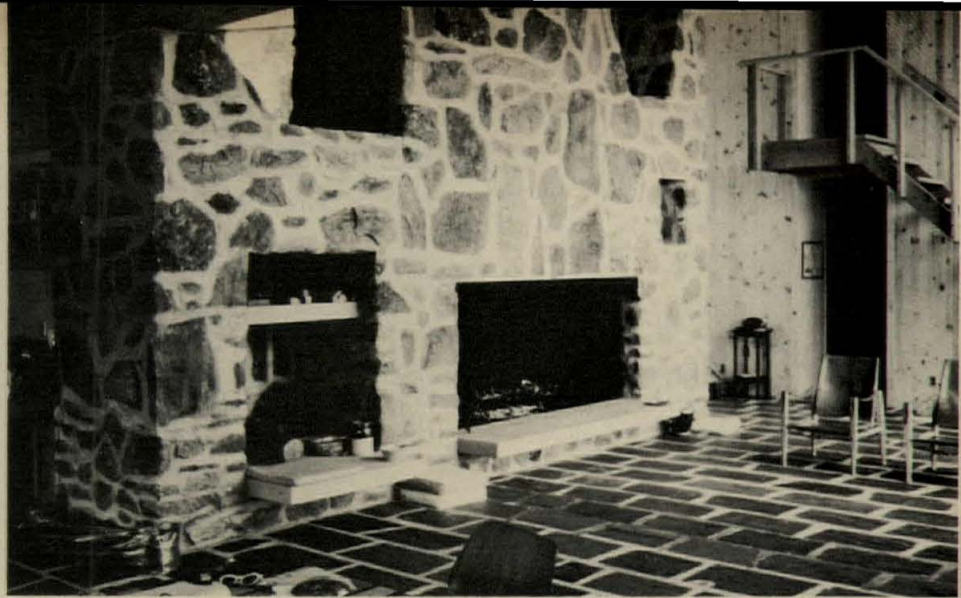
NOYES HOUSE, NEW CANAAN, CONNECTICUT, 1955

Noyes: This fireplace is a detail which echoes the larger field stone walls of the house. Like the house, flanking stone elements contain other elements between them — in this case the nine-foot-wide fireplace on the living room side, and floor-to-ceiling bookshelves on the study side. The fireplace is backed with soapstone; the panel above is sand-float-finish plaster.



SCALE 1/4"=1'-0"

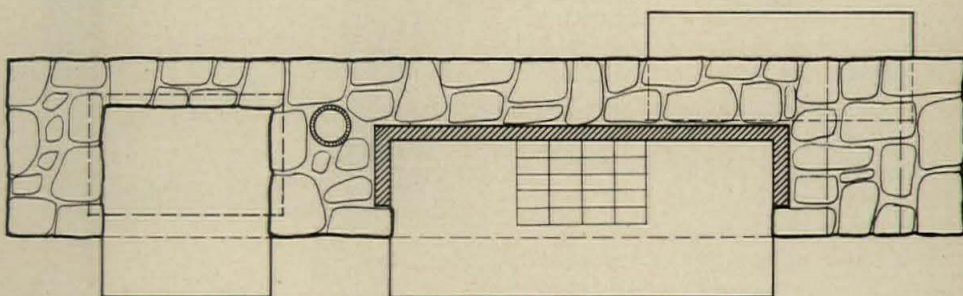




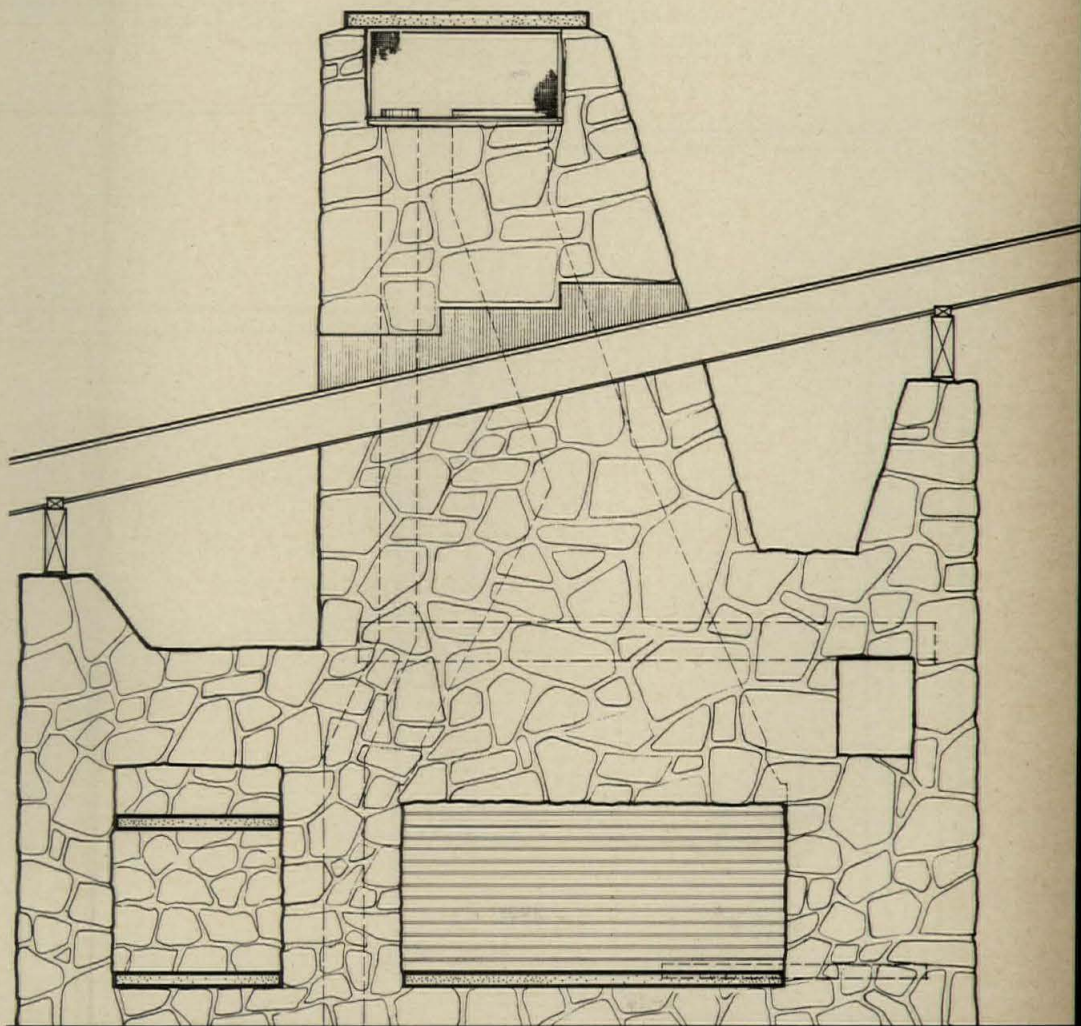
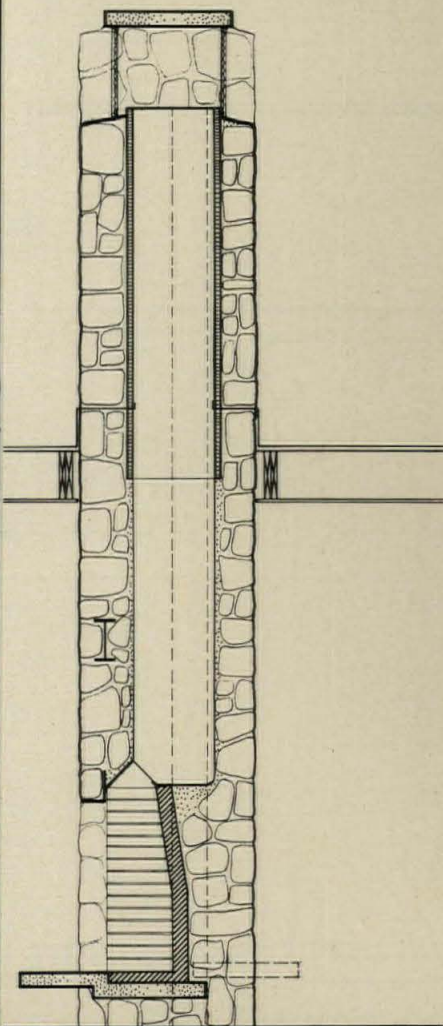
Eliot Noyes

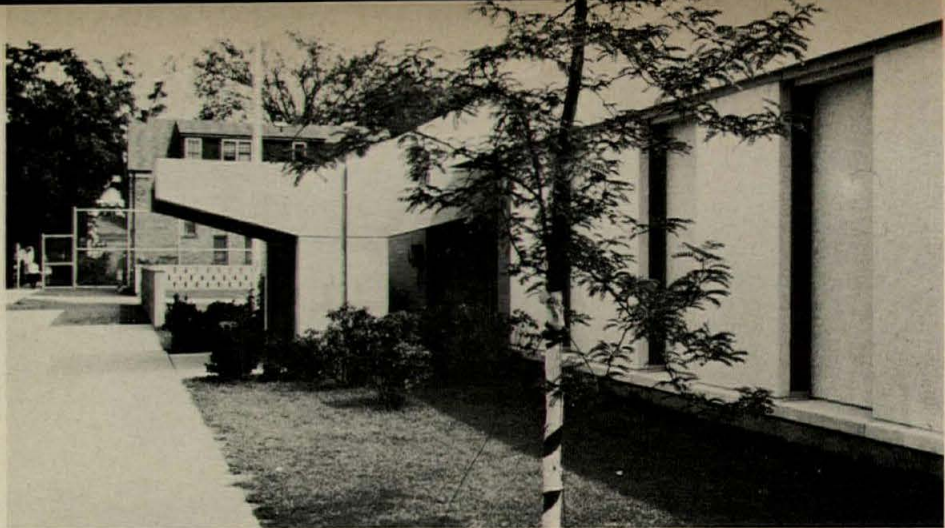
OHLY HOUSE, SHERBURNE CENTER, VERMONT, 1961

Noyes: The sculptural shape of this fireplace is derived from its dual role as both fireplace and supporting structure. Two heavy timber roof beams bear directly on integral field stone piers at the outer limits of the masonry mass. The firebox, woodbox and cut-outs in the stonework are carefully positioned as units and spaced to retain the continuity of stonework. Slabs project from the major openings to serve as hearth, seat, and extension of the woodbox.



SCALE 1/4" = 1'-0"



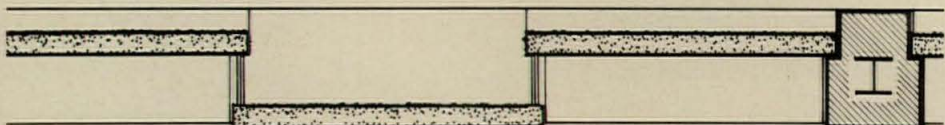
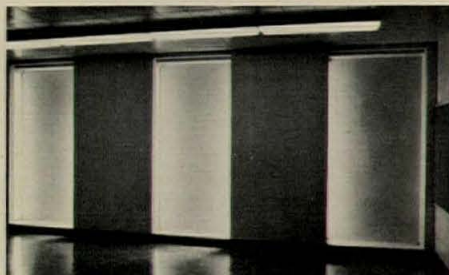


Eliot Noyes

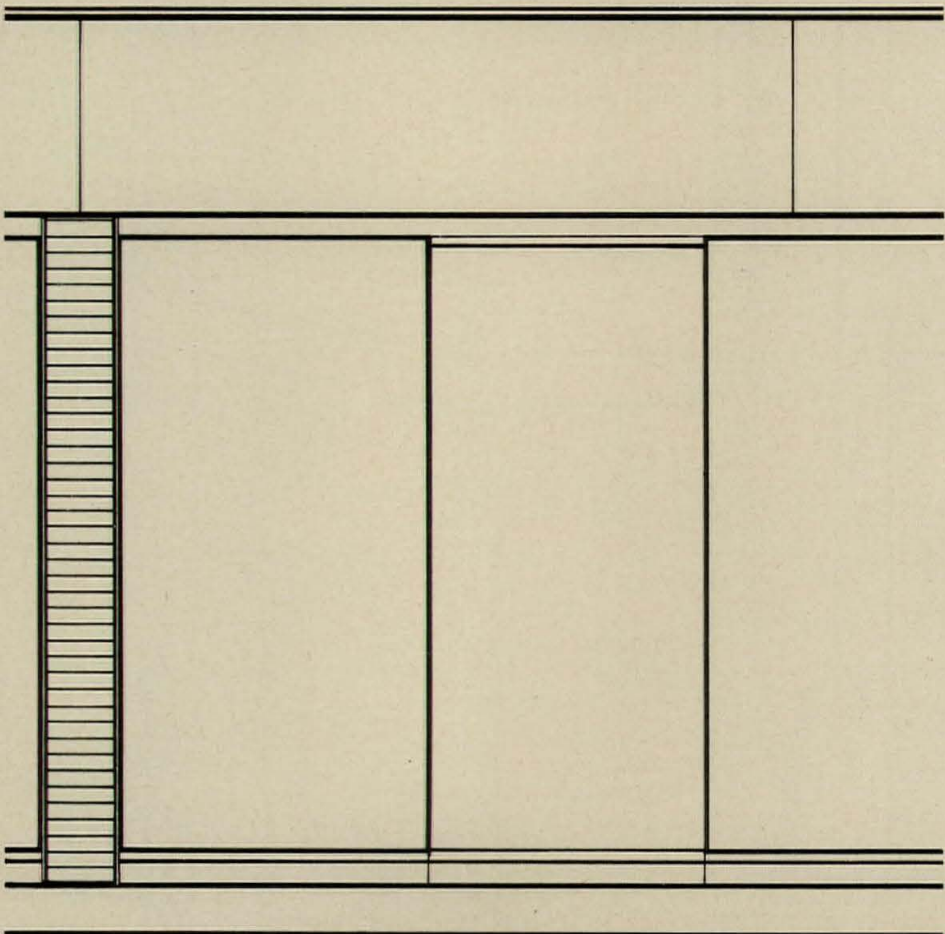
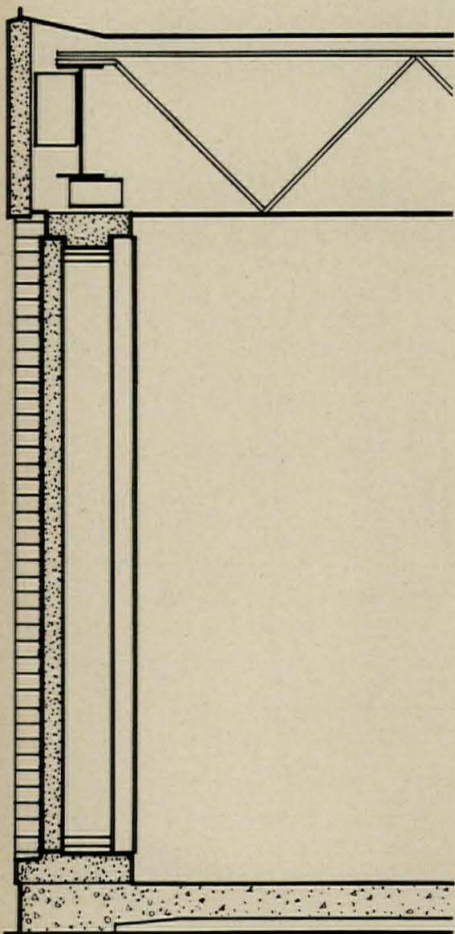
TIMOTHY DWIGHT SCHOOL, NEW HAVEN, 1965

Noyes: The exterior walls of the classrooms are made of full-height precast concrete panels, set in a staggered arrangement to hold narrow sections of translucent glass between. The glass is held in place by small aluminum glazing beads cast into the inner and outer surfaces of panels during the forming process. The exterior face of the panels is surfaced with an exposed quartz aggregate. This system was developed to minimize noise and distraction from a busy city thoroughfare and at the same time provide well distributed daylight.

Architects: *Schilling & Goldbecker*; design consultants: *Eliot Noyes & Associates*.



SCALE: 3/8" = 1'-0"



Third in a series of articles
about young architects
who build a successful practice
with work of notable quality

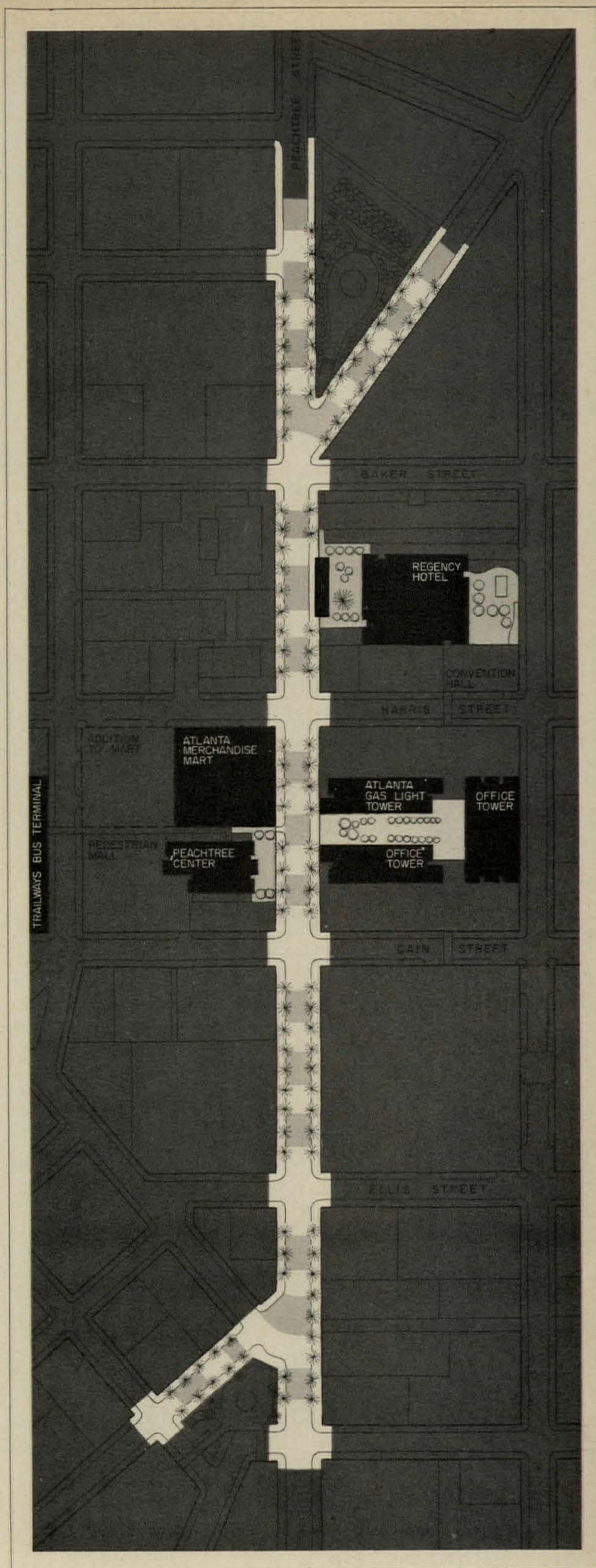
JOHN PORTMAN

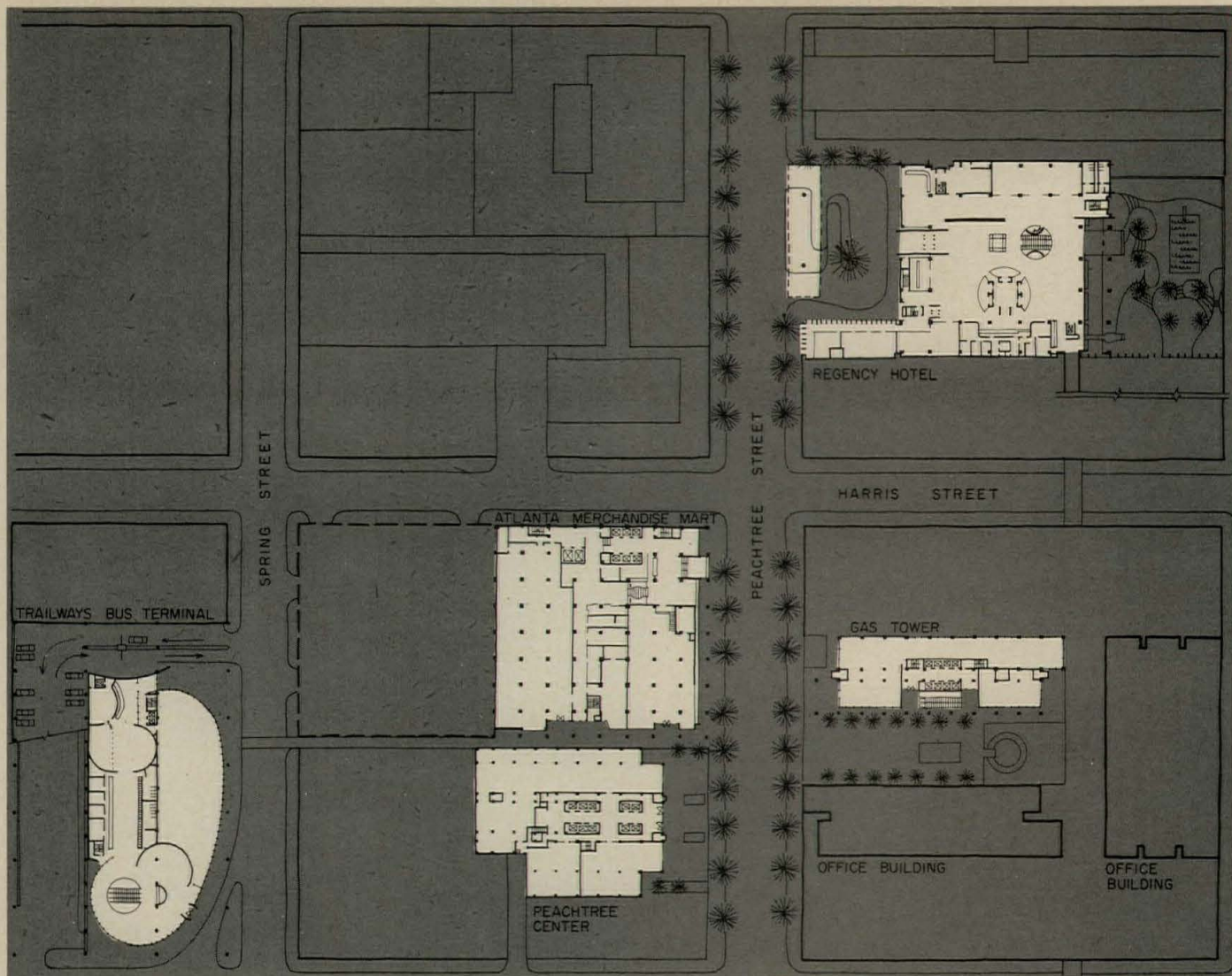
ATLANTA'S ONE MAN URBAN RENEWAL PROGRAM

Peachtree Street in downtown Atlanta, Georgia is becoming a street of buildings designed by the firm of Edwards and Portman. The Merchandise Mart and an office building are already completed, an 826-room hotel and another office tower are under construction, and two more office towers and a bus terminal are projected. It is no coincidence that all this activity is the work of only one firm, as each of these buildings is a real estate venture in which John Portman has a heavy financial interest. In addition, Portman is the head of a property owners' association which proposes to renew all the street furniture and lighting along Peachtree Street, and Edwards and Portman, along with Sasaki, Walker, DeMay Associates, are preparing the designs.

Many a young architect, as he sits at his drafting table trying to take \$4,000 out of his latest garage-bedroom extension, must contemplate going into real estate in order to create larger opportunities for himself. But few young architects start out with the equity for a large real estate venture, and they have seen what happens to friends and colleagues who put their own money into a client's shaky speculation. How then does Portman do it, and where did the money come from?

The story really begins about 10 years ago when John Portman was 31



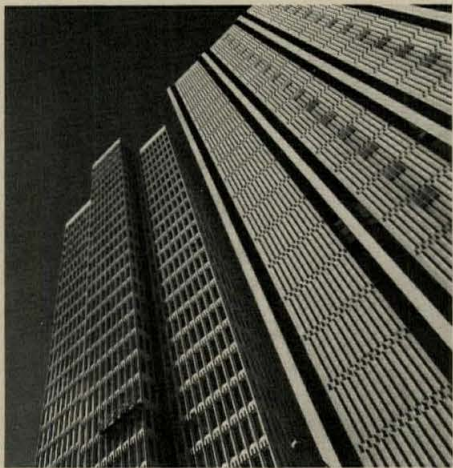


PORTMAN'S BUILDINGS SUPERIMPOSE A NEW SPATIAL PATTERN

on Atlanta's gridiron street plan. The Greyhound Terminal and parking garage (1) will be connected by bridges and malls to the Merchandise Mart and the Peachtree Center Office Building (2), the Atlanta Gas Light Tower (3) and the Regency Hotel (4).



1



2



3



4

Clyde May

years old. He had just opened his own office, and, while the prospects were moderately encouraging, the really challenging commissions were not coming in. Outside his drafting room window stood an empty five-story building; and, as the days went by, Portman began to regard it with a speculative eye, wondering what type of use all this vacant space might serve. Atlanta is a rapidly growing distribution center, and Portman began to think that there might well be a need for a permanent wholesale market like Chicago's Merchandise Mart. He approached the building's owner with the suggestion that they produce a furniture show together. The owner declined to participate himself but was delighted to lease the building for such a purpose; so Portman formed a corporation and set out to produce the show on his own.

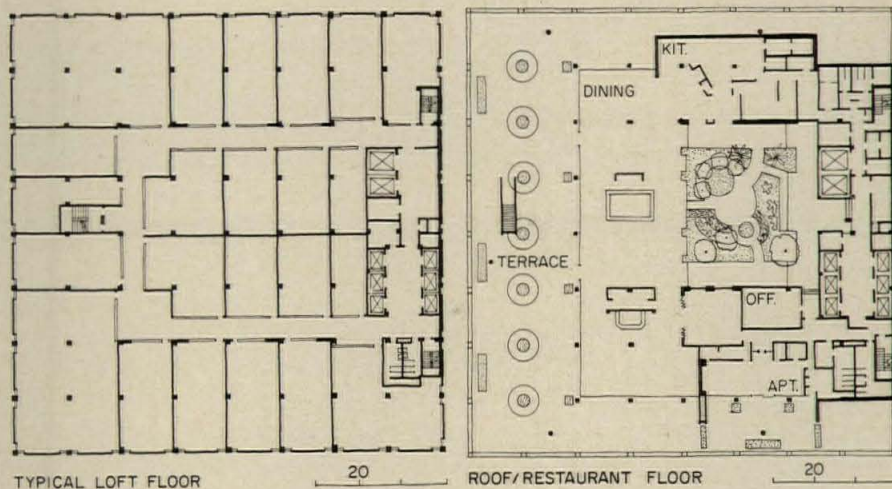
First Portman found an architectural partner

Soon after he began work on the project, Portman made another significant decision. He merged his office with that of H. Griffith Edwards, a highly respected architect with a small, but well-established practice, who occupied space in the same building that Portman did. Edwards, author of a well-known book on specification, took over the office management and production end of the combined operation, leaving Portman with more time to devote to design, and to promoting the Mart.

The furniture show opened on schedule in January 1957 and was a modest success. Some 32 exhibitors leased about 40,000 square feet of space. Portman took the occasion to predict that within five years the Atlanta Merchandise Mart would be housed in a million-square-foot building of its own. This prediction was to come true, but Portman's difficulties were far from over at this point. Although each semiannual show at the Mart was more successful than the last, the clear demonstration of the idea's potential produced several rival ventures, including one backed by state enabling legislation. After two years of effort, Portman finally obtained an \$8-million loan commitment from the Metropolitan Life Insurance Company. That did it; the rest of the financing was easily found and two months later ground was broken for a 23-story Mart building, designed, not surprisingly, by the firm of Edwards and Portman. The decisive factors in Portman's success over his rivals were probably that his Mart was a going concern, and also that Portman had options on a downtown site rather than a suburban or airport location.

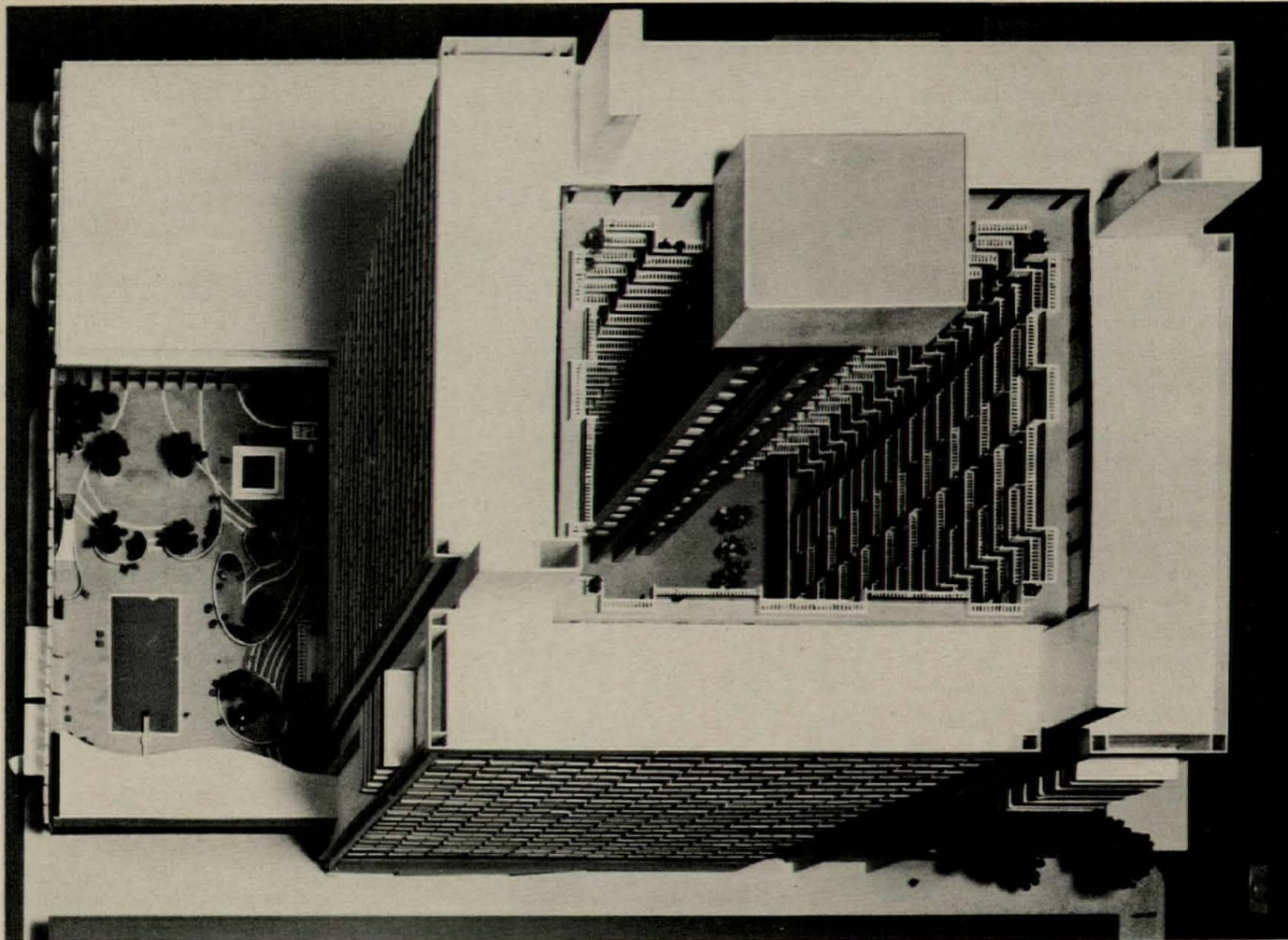


THE MERCHANDISE MART was Portman's first major financial venture. Designed primarily for trade shows and permanent wholesale displays, some of the floors are used for office space. The penthouse contains a restaurant (above) and a suite for visiting dignitaries (below). A bridge connects the Mart to the Peachtree Center Office Building.

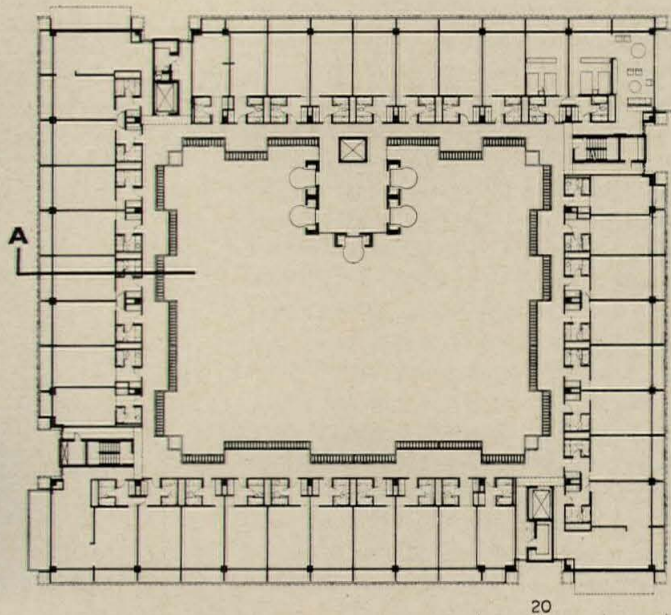
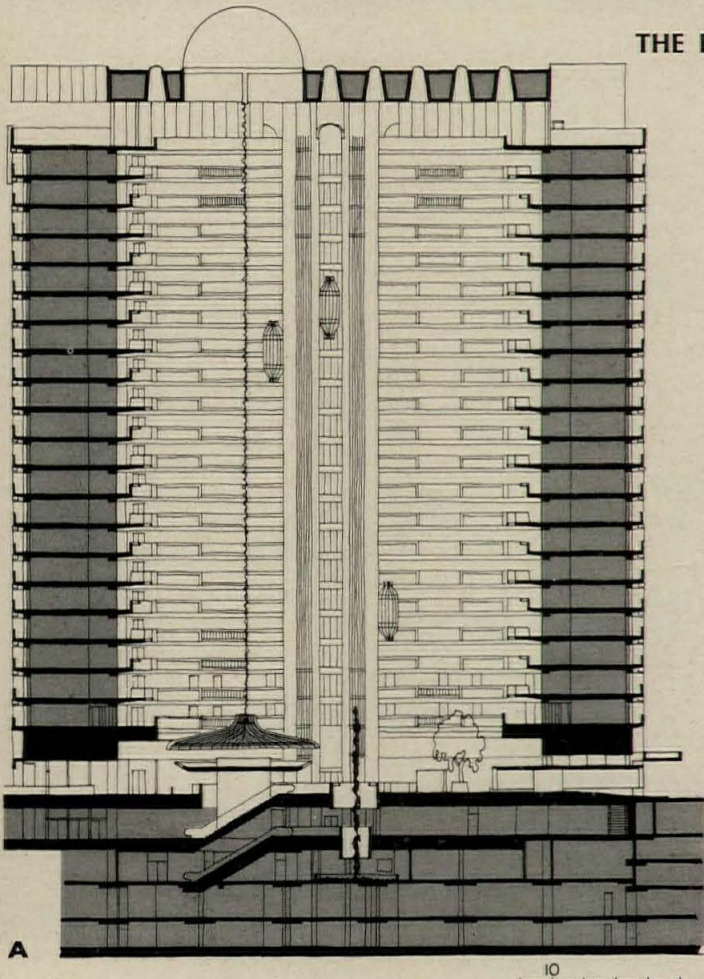


Alexandre Georges

Clyde May



THE REGENCY HOTEL, now under construction, is the first major hotel to be built in downtown Atlanta since the nineteen twenties. It will have 826 guest rooms, a parking garage for 500 cars, and extensive convention facilities. The 23 floors of bedrooms are grouped around an immense courtyard, which is roofed over and skylit (the model photo was taken with the roof removed in order to show the interior space). Each bedroom has its own balcony, reached through sliding glass doors.



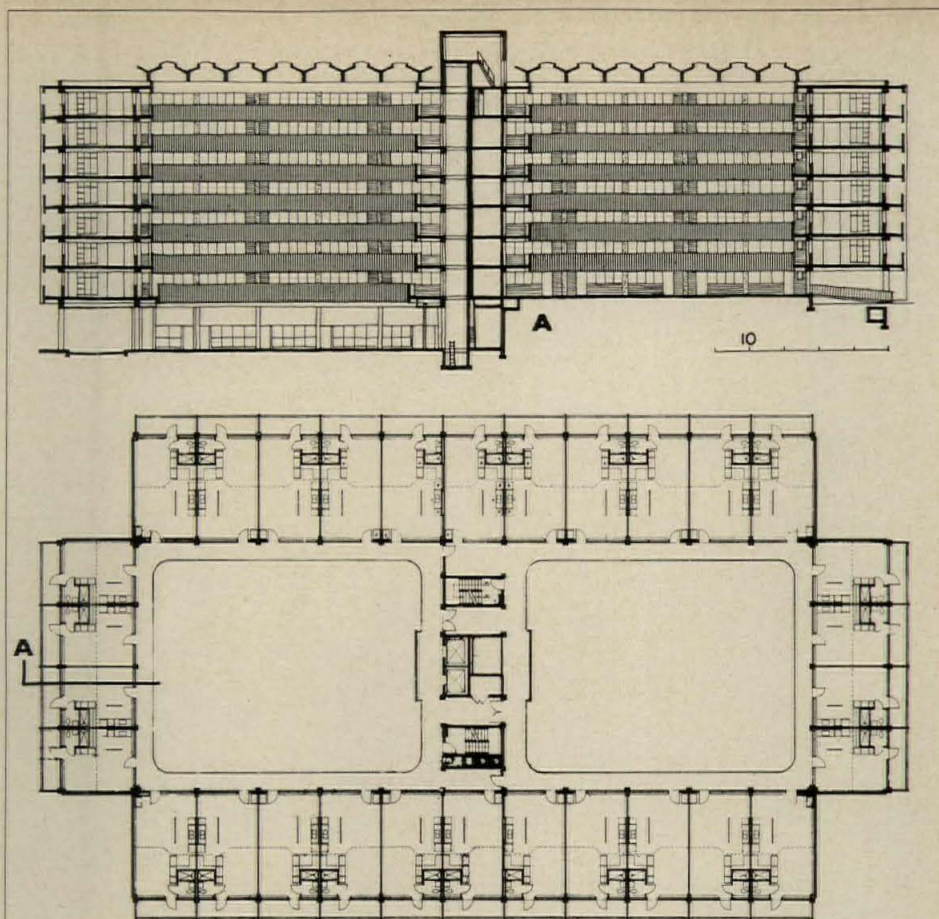
Portman then found a financial partner

In the course of raising the money for the Mart, Portman made an important acquaintance, Trammell Crow, the Texas real-estate investor, who had been following a parallel course in promoting and building a large market center in Dallas. Crow and Portman became partners in a related venture, the Atlanta Decorative Arts Center, a small merchandise mart devoted solely to furniture that was completed in 1961. Crow also acquired a 30 per cent interest in the Mart itself.

With the Mart well on its way, Portman enlarged his view of what might be possible in downtown Atlanta and began to assemble property for more ambitious projects. Next on his list was an office tower, the Peachtree Center, in which Crow is also an investor. This building is now completed and stands next to the Mart. Owing to an oddity in the property assembled, the building had to be designed so that a segment could be taken down separately, accounting for its expression as a series of slabs. Portman then began to develop a master plan for a large portion of the downtown area, relating each element to the design of Peachtree Center. Ironically, the Mart, the financial keystone of the whole edifice, turned out to be in a less than ideal location as the full range of available property began to unfold; but the rest of the buildings are closely related through a system of malls and flying bridges. Full details cannot be released until Portman controls all the property.

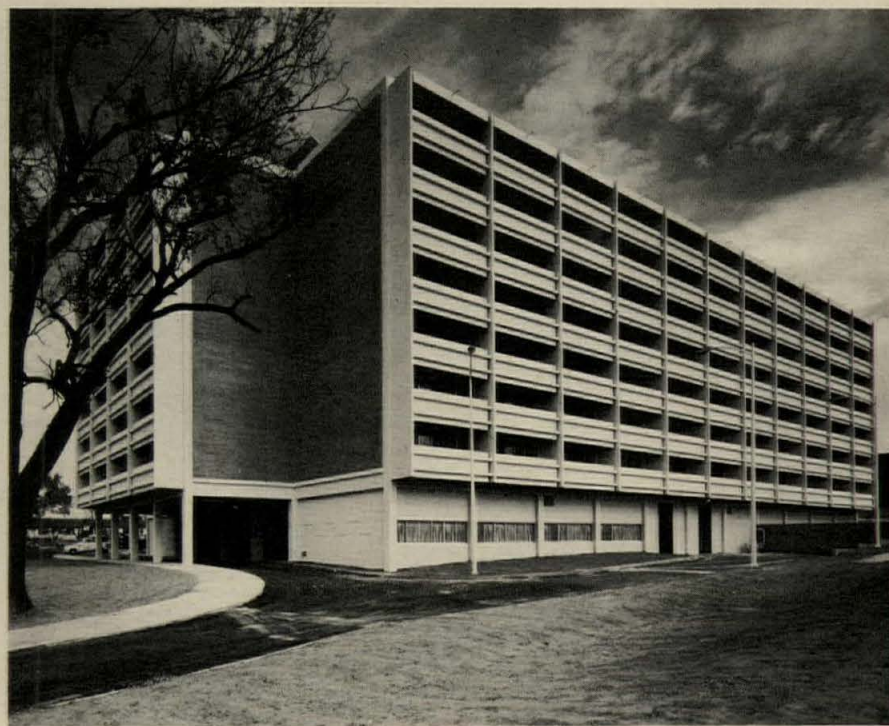
The development of each project is a four-stage process

First, Portman, in his role as property developer, obtains an option on the land. Next, Portman, the architect, does a schematic design, including outline working drawings and specifications which will be sufficient for stage three, getting a firm price commitment from a contractor. Then Portman goes to financial circles for the money. Investing institutions will lend up to 75 per cent of an appraised value, which is based upon an estimate of a building's earning power over a period of years. The amount of the loan may in fact be a much higher percentage of a building's actual, or bricks and mortar, value; it could even cover the full construction cost in some instances. Ordinarily a certain portion of such a loan is contingent upon the rental performance of the building, with the developer receiving increments of this portion until the building is fully rented and he has received the full amount. Presumably



THE ANTOINE GRAVES HOUSING FOR THE AGED

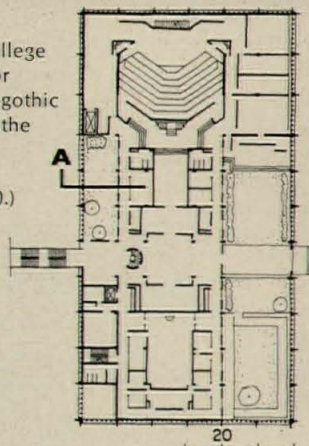
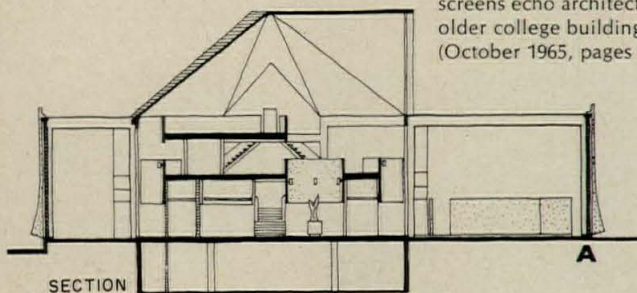
is a low-cost public housing project. Efficiency apartments are grouped around two roofed-over central courtyards. Each unit has its own exterior balcony, as well as windows giving on the courtyard, assuring good ventilation even on hot days. Residents can meet and mingle in the large courts, or can enjoy complete privacy if they so desire.



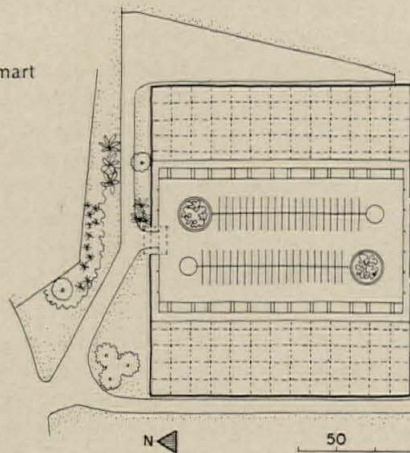
Alexandre Georges



DANA FINE ARTS CENTER at Agnes Scott College conceals complicated interior spaces behind decorous neo-gothic screens. Frankly ornamental, the screens echo architecture of older college buildings. (October 1965, pages 158-160.)



ADAC, the Atlanta Decorative Arts Center, is a small merchandise mart devoted exclusively to furniture exhibitions. Construction took place at the same time as the Atlanta Merchandise Mart itself.



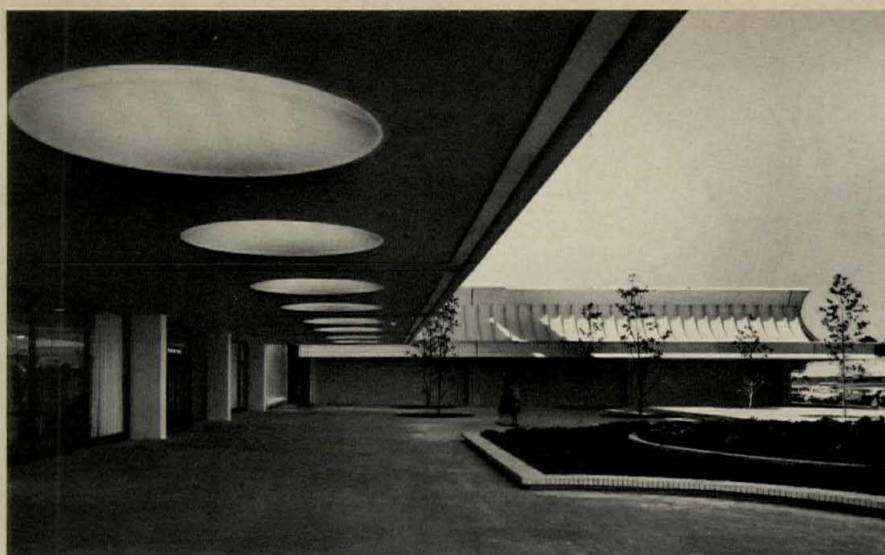
a developer should not wish to go further into debt than he need to, but the interest charges on such large loans will serve as an offset to taxes during a building's first years of operation. For tax reasons, all of Portman's recent buildings are owned by partnerships, rather than corporations, a separate one for each project.

How good a client does Portman find Portman?

About half the projects, and about 75 per cent of the dollar value of Edwards and Portman's practice derive from Portman's activities as a developer, so that a great deal of the office's success hinges on how good a client Portman is for himself. The answer would seem to be that he is a very good client indeed. If the Regency Hotel, shown on page 136, is a financial success, which, as the developer, he fully expects that it will be, it will be the best demonstration of Portman's approach to date. It is a fully realized work of architecture which, with its large central courtyard and elaborate public spaces, would never have been produced by the ordinary developer. Says Portman: "An architect should be an initiator, especially in a growing country. He shouldn't wait to come in at the end of the project, let things happen to him, and then blame the client." As far as Portman is concerned, the bolder the concept, the better: "Even if only 80 per cent of it comes off, it is better than if it didn't come off at all."

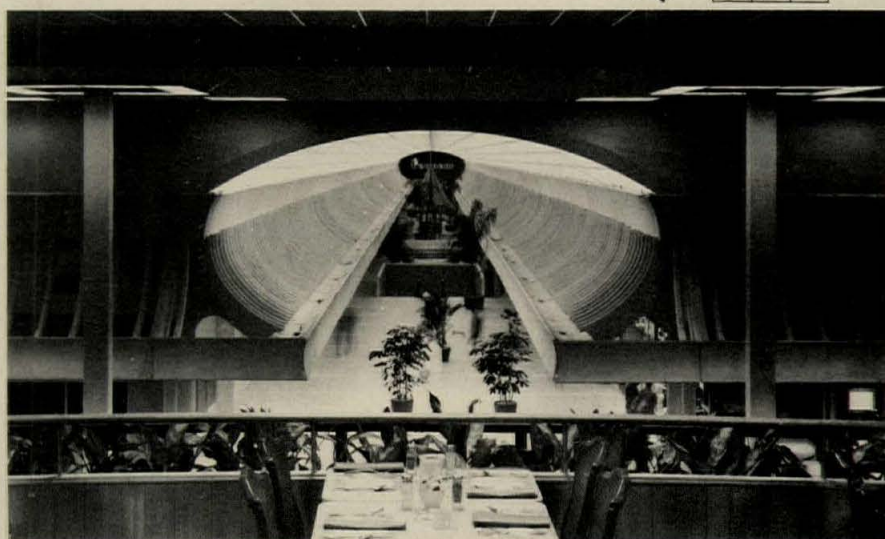
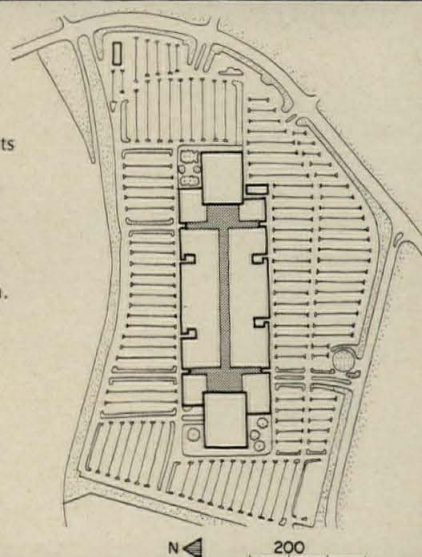
The two sides of Portman's practice are well integrated; in fact, there is really no distinction between the way Portman designs for himself, and for his other clients. For example, a large interior courtyard, like that of the hotel, appears in Portman's earlier design for the Antoine Graves Houses, a low-cost public housing project for the elderly. Similarly, the perforated screens of the Atlanta Decorative Arts Center are elaborated upon in Portman's design for the Fine Arts Building at Agnes Scott College. What happens to a speculative project when Portman is not in full control can be seen at the Greenbriar Shopping Center, where a lot of the detail was skimped after Portman sold out his interest in order to have more capital to invest downtown.

Portman's partner, Griffith Edwards, says of him: "In spite of the fact that John is an excellent promoter, and could give up the practice of architecture tomorrow, he is primarily an architect, and has not slighted Edwards and Portman in this regard. It is just that he can imagine these business relationships just as he can imagine spaces."



GREENBRIAR SHOPPING CENTER

has an extensive landscaped interior mall and courtyard system. Awning-like pre-cast concrete elements supply a continuous motif both inside and out. Portman was originally an investor in this project. After he sold out, a rising cost squeeze forced a cut-back in landscaping. Center still has strong architectural unity and form.

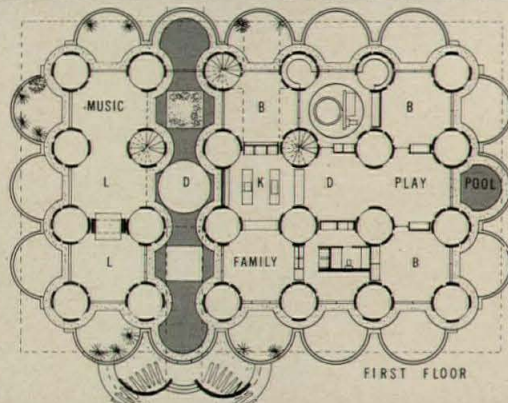


Clyde May photos



PORTMAN'S HOUSE

shows his predilection for manipulating architectural space within an orderly restraining context. System of 24 cylindrical forms admits of constant variation. Some rooms are two-story, others one, but strong, flat roof plane unifies the composition (Mid-May 1965, pages 126-129).



Alexandre Georges photos

Edwards feels that the talents of the two partners complement each other; and, while Portman is capable of handling the details of execution and Edwards of initiating designs, the partnership provides a capability that neither man would have on his own.

The size of the office has grown very rapidly in the last few years, from five men to 48; but Edwards and Portman have been careful to hire highly qualified personnel. Almost all of the staff are graduate architects or engineers, and a large number of them are registered. Portman develops the concept for each project but works closely with a project manager, who stays with a single job from its earliest stages to completion. Edwards watches over the production of working drawings and specifications, and also oversees site supervision and office management. The firm's profits are shared with employees on a merit basis, by means of a cumulative point system administered by senior members of the office.

Each problem has an individual solution

Portman believes that every architectural problem has its own particular solution, and he tries to approach each design without preconceptions. He begins by studying the site, and goes on to a thorough investigation of the program, concentrating on its most individual elements. Then, instead of going to the drafting board, he lets his mind revolve the problem for a while. In due course, he finds, the basic design concept simply comes to him, and is ready to be set down on paper. Portman is fortunate that his mind can work in this way, because his activities as a real estate promoter constitute a full-time job in themselves.

Portman's basic design preoccupation is with the manipulation of space within a clearly established and orderly context, a design approach which is probably most clearly seen in Portman's own house, shown at left. It may be this interest in a restraining context that has prevented Portman from trying to make use of any government-sponsored renewal program that would permit changes in the existing street and property pattern. Perhaps, in the future, the city of Atlanta may decide to tie Portman's activities into an over-all renewal plan. In any case, Portman's work stands as a reminder that a determined and creative architect, who understands the economics of business and real estate, can employ these forces in the service of architecture—with good results both for himself and the community at large.

Jonathan Barnett

A large investment of public funds at the Federal, state and local levels has been made over the years in the development of Philadelphia's Independence Mall and its surrounding historic areas. The Rohm & Haas Company, the first private investor to build on the Mall, has acknowledged the public character of the new setting, and the company's responsibility to all citizens, by erecting a building of dignity and restraint, which should establish a standard for this redevelopment sector.

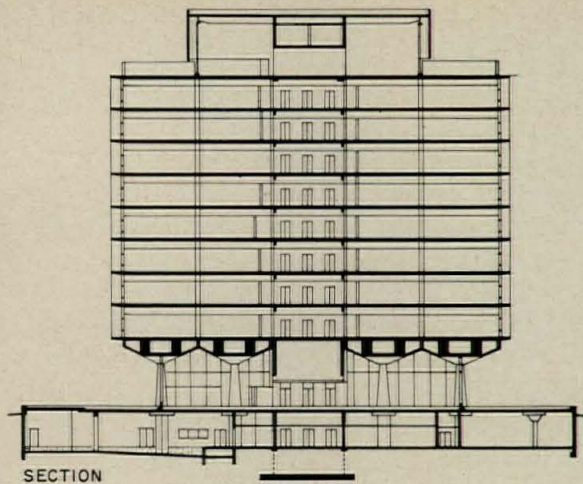
PRIVATE BUILDING RESPECTS PUBLIC SITE



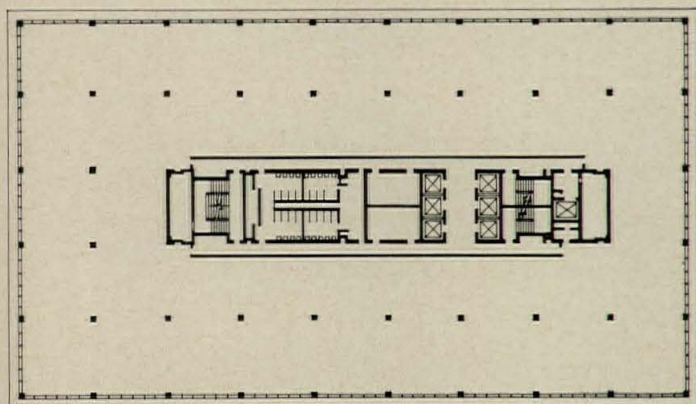
©Ezra Stoller Associates photos

While New York City's continuing office building boom indicates that many leading U.S. firms still consider it the place to locate their corporate headquarters, cities like Philadelphia, with the aid of urban renewal funds, are waging a big battle to persuade locally based companies to stay home, and expand their office space in the heart of downtown, to reverse the well-known decline of the urban core. Those executives who don't have their eye on New York City, but who are contemplating the construction of an office building beyond the city limits, are eagerly coaxed to remain in center city.

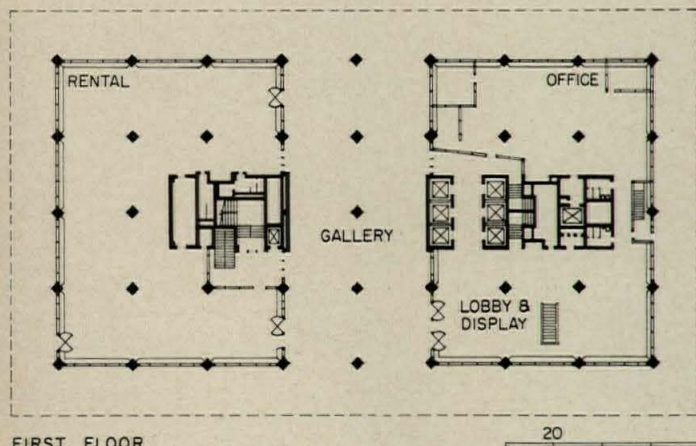
The big bait is the use of public funds by local redevelopment authorities as authorized by Title I, to subsidize the cost of land acquisition to the private investor. In Philadelphia, where urban planning is more sophisticated than it is



SECTION



TYPICAL FLOOR



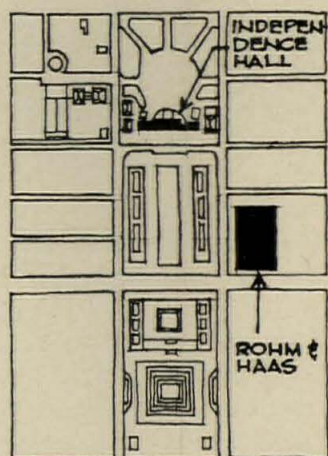
FIRST FLOOR

in many cities, additional catalysts to help secure private investment in renewal are the amenities already there: those landmarks, historic monuments, parks and transportation facilities developed or preserved within the context of future public improvements. If the provisions for the future which have been planned by the city appear to be firmly conceived and programmed, major local businesses are expected to continue their commitment to downtown.

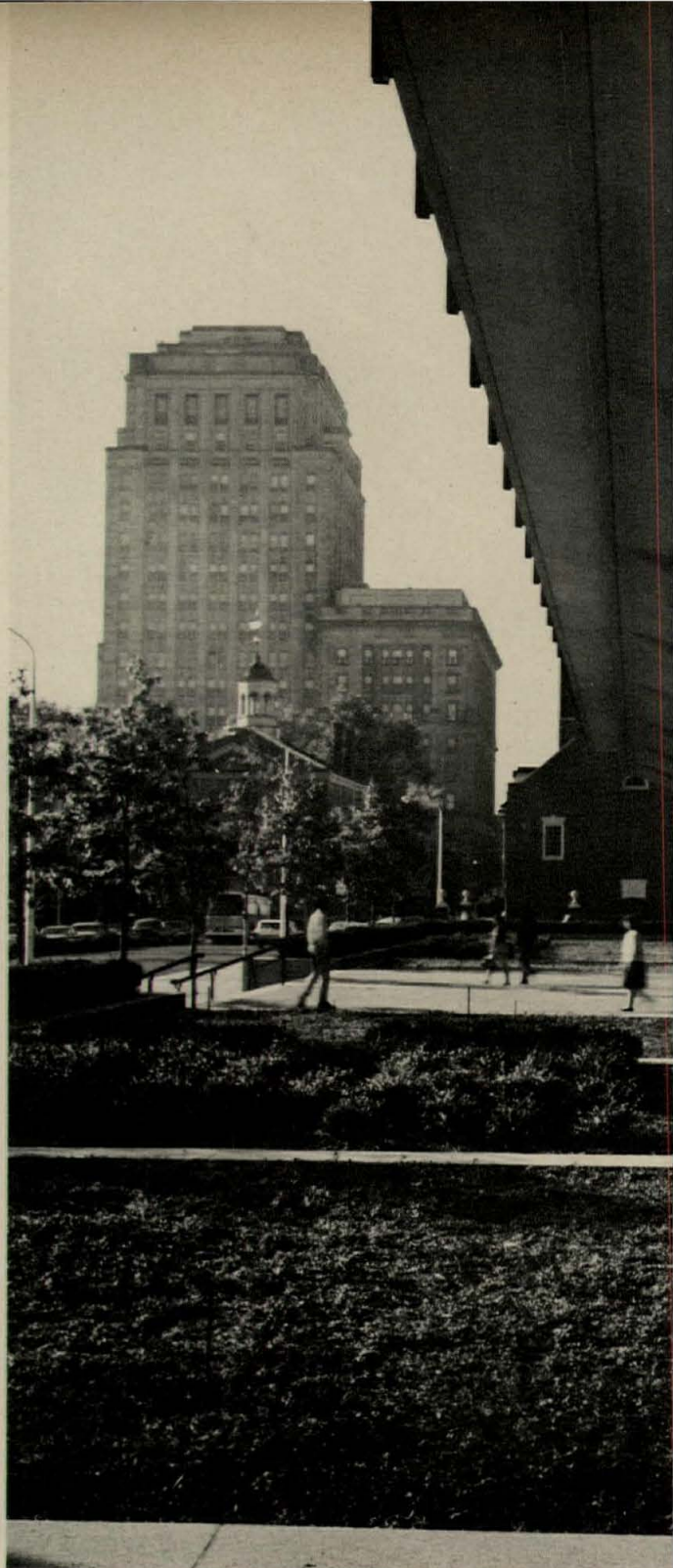
Rohm & Haas is the first company to initiate and complete a new building on Philadelphia's Independence Mall, a huge formal park, begun in 1950 and now virtually complete, which extends northward from Independence Hall. Through its decision to participate in the plans of the Philadelphia Redevelopment Authority and the Old Philadelphia Develop-



ment Corporation, Rohm & Haas, whose corporate headquarters has been in Philadelphia for more than 50 years, now occupies a space presided over by the building which symbolizes the birthplace of the nation. Adjacent to terminal points of the city's new expressway system and major parking terminals (including one being completed under a section of the Mall), the Rohm & Haas building is conveniently located in relation to future extensions of the railroad commuter system, proposed new subway lines, and lower-level pedestrian concourses. Philadelphia's planners hope that this elegant new structure, designed by Pietro Belluschi in collaboration with the George M. Ewing Company, will itself serve as a catalyst for the long-sought development of both sides of the Mall and rejuvenation of the nearby shopping area.



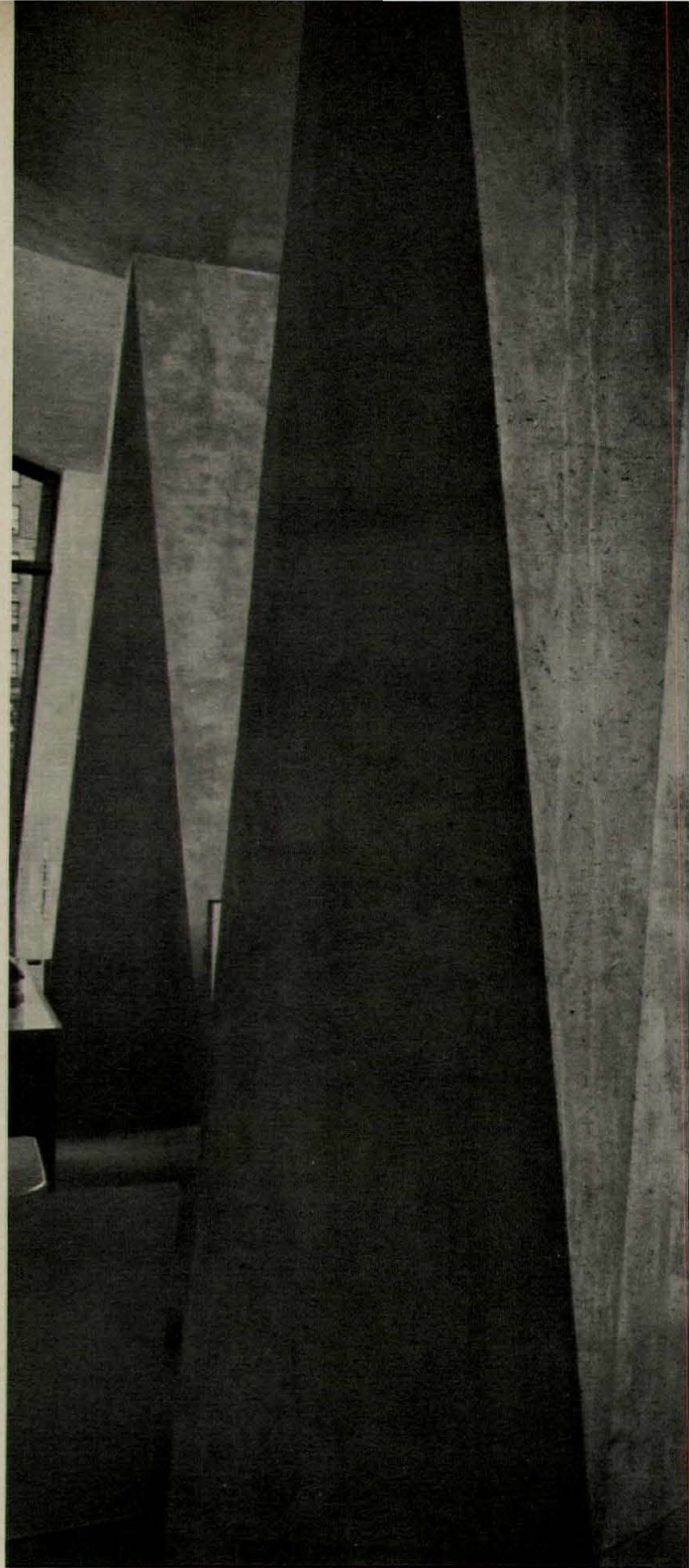
The strong horizontal pattern of the facade is generated by the projecting edges of the floors and the broad sunshades of acrylic plastic. A principal product of Rohm & Haas, acrylic plastic was to be used wherever feasible in the new structure. Although the plastic is available in all colors of the rainbow, Pietro Belluschi persuaded the company's executives to settle for brown spandrels and bronze colored, translucent corrugated panels for the sunshades, which are supported on a bronze anodized aluminum lattice which projects 4 feet beyond the wall line on all four sides. To any showing hesitation about brown he said: "Go look at the Seagram Building." The photograph above was taken from the Mall and shows the main facade. The stairway to the podium level is on the axis of an open gallery (see plan).





The structural system at the podium level consists of concrete columns which the architects describe as being "of prismatic shape, capped by inverted truncated pyramids." These columns occur at the center of each bay in a structural system which changes the column spacing at the second floor. Concrete columns in the eight floors above the podium carry their loads to the intersecting corners of the pyramids (see plans). The typical floor construction is grid flat slab. The formwork for the columns at the podium consisted of plastic-coated plywood with no visible joints.

The 4-foot projection of the sunshades affords a safe walkway for window washers. The sunshades are an opaque dark bronze when viewed from outside the building, but become a translucent pale shade as seen from within.





The design of all interiors is well handled. At the podium level two identical enclosed spaces separated by an open passage contain to the north the Rohm & Haas lobby and to the south a branch of the Fidelity-Philadelphia Trust Company. The bank interior shown above is similar in lighting, materials and finish to the Rohm & Haas lobby. The acrylic plastic lighting fixture, hung in the interior podium bays, was designed by Gyorgy Kepes. As on the exterior, acrylic plastics were used wherever possible — as translucent room dividers, in light fixtures and in door knobs specially designed not to conduct electricity. The firm of Saphier, Lerner, Schindler, Inc. acted as interior consultants to the George M. Ewing Company. All colors, materials, furnishings and finishes were tested by Rohm & Haas with the architects and interior consultants.



All art objects commissioned by Rohm & Haas again showcase the company's product. The sculpture above stands at the entrance to the executive conference room and reaches from floor to ceiling; the sculptor was Arturo Cuetara. On the fifth floor there are two large plastic murals. The coat rack was specially fabricated for use throughout the building, as were many other items. Cost of construction, not including land or furnishings was approximately \$10 million.

ROHM & HAAS BUILDING, Independence Mall West, Philadelphia. Architect: *George M. Ewing Company*; consulting architect: *Pietro Belluschi*; consulting landscape architect: *Dan Kiley*; interiors: *Saphier, Lerner, Schindler, Inc.*; construction management: *Turner Construction Company*. The Rohm & Haas Company served as its own general contractor.



SIX HOUSES FROM ABROAD

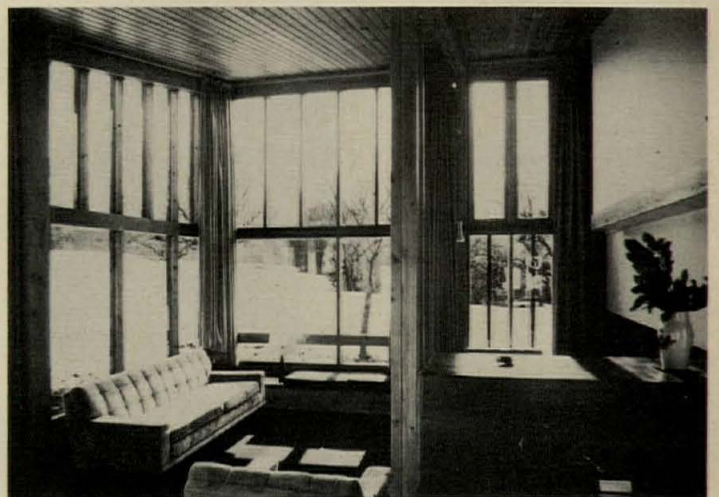
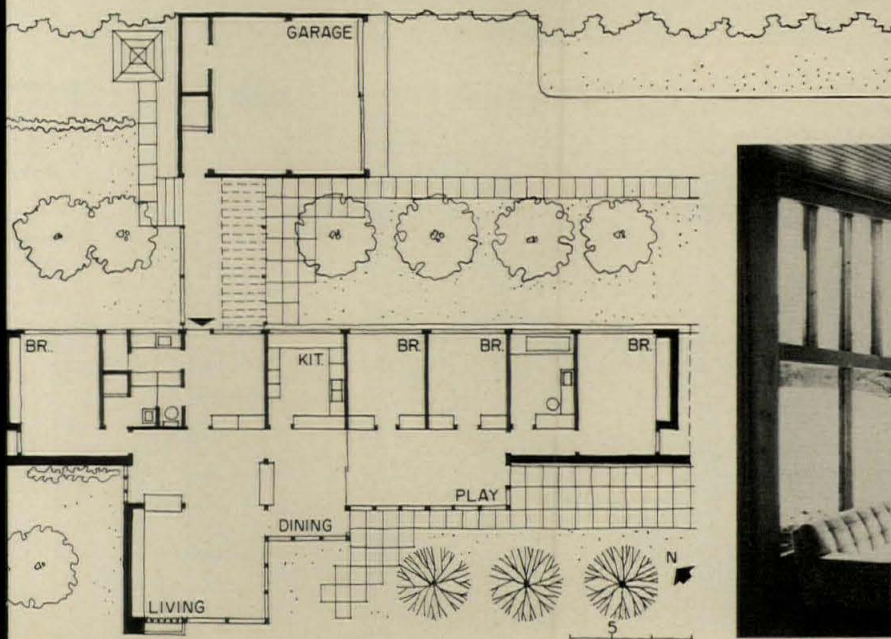
These houses are presented

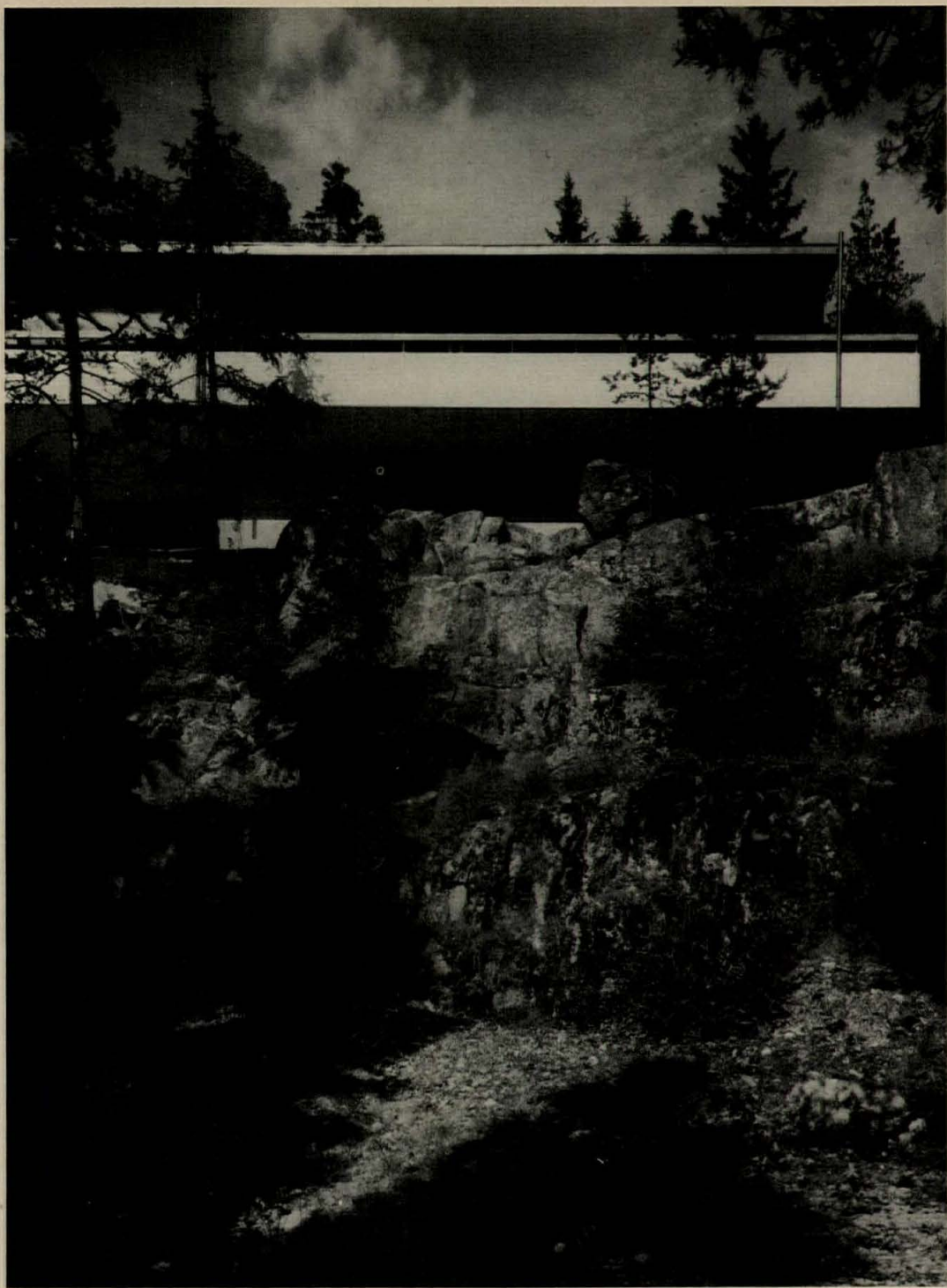
with the idea of giving some insight into the differing ways in which architects around the world are approaching the problems of house design, and include a number of fresh and interesting ideas. Although the houses are widely different in concept, in each case maximum use has been made of the site, whether it be a crowded city lot or a rocky mountainside. This tendency for architects to integrate the house with its surroundings may well spring from a renewed concern to establish a meaningful relationship between man and the natural world.

Drummond Young photos

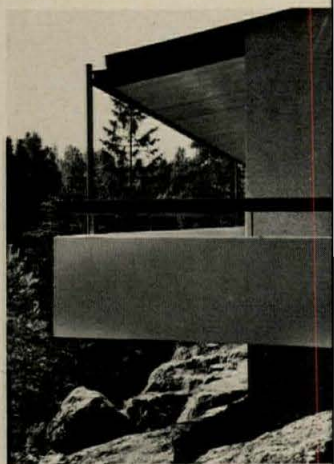


SCOTLAND An Edinburgh apple orchard near the ruins of Craiglockhart castle is a romantic enough setting for a contemporary town house, and the architects have made the most of their opportunities by creating an open living area, whose high glass walls and staggered plan take dramatic advantage of the view. The pitched roof and heavy timber mullions reinforce the vertical emphasis of this elevation, in contrast to the flat-roofed horizontal treatment of the bedroom wing. Architects: Morris and Steedman.

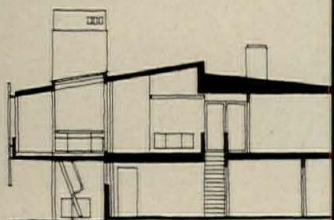




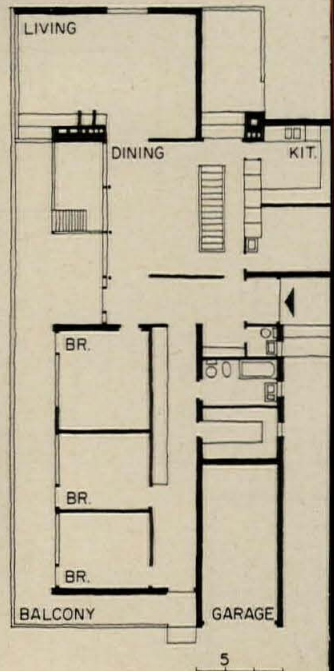
Havas photos



FINLAND Though the clean cut horizontal lines of this house provide a dramatic contrast to the rugged rock face on which it is perched, the house nevertheless seems to be an integral part of its surroundings. The strength of the elevation, the use of concrete for exterior walls, and the way in which the cantilevered balcony juts out above the rock—rather as though it were itself a crag in the rock formation—also contribute to the successful integration of a sophisticated contemporary structure with a wild, untamed landscape. Architect: Woldemar Baeckman.



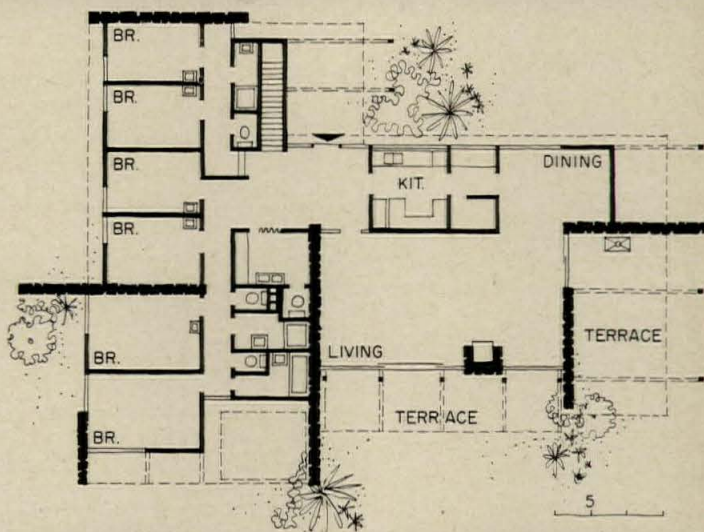
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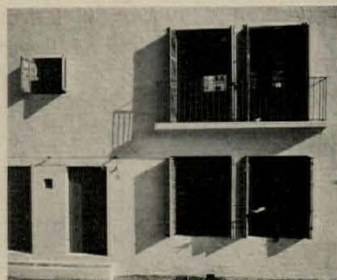




Ernst Deyhle photos

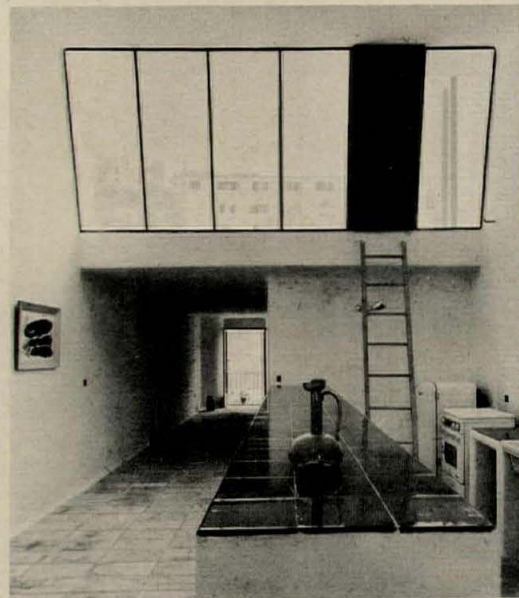
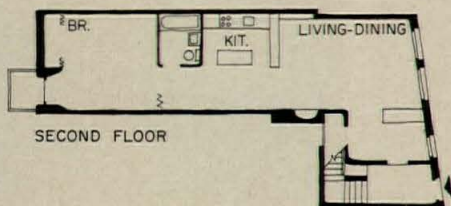
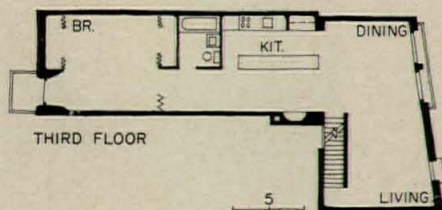
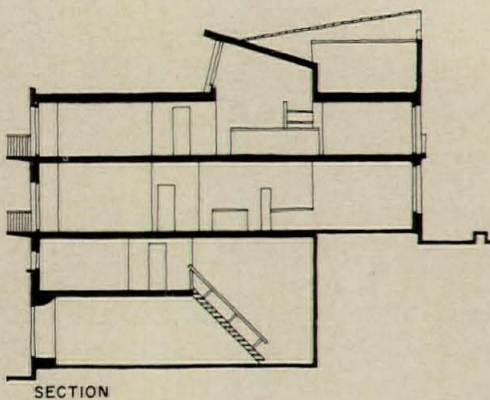
GERMANY A forest house and hunting lodge which is closely related to the outdoor world, but at the same time provides protection and relaxation from the "rigors of the chase," has as its central focus a large open living-dining area dominated by a rubble-stone fireplace and a folded-plate wood roof. Glazing extends into the roof gables, lightening the effect of the roof structure. Warm red quarry tiles are used for the floors and extend out to the terrace. The house is beautifully detailed and planned for year-round comfort and convenience. Architect: Walter Brune.





SPAIN A summer retreat in the Balearic Islands is what almost anyone sweltering in an American city might dream of, and José Luis Sert's house in Ibiza seems to be the perfect realization of such a dream. The sculptured simplicity of the interiors, cool tiled floors, minimal functional furnishings and heavily shuttered windows all contribute to the restful feeling of the house.

The house, which steps back some distance from the street on a sloping site, is bigger than it appears from the street elevation, and is planned in three self-contained apartments with a spacious roof terrace. Architects: Sert, Jackson and Associates.

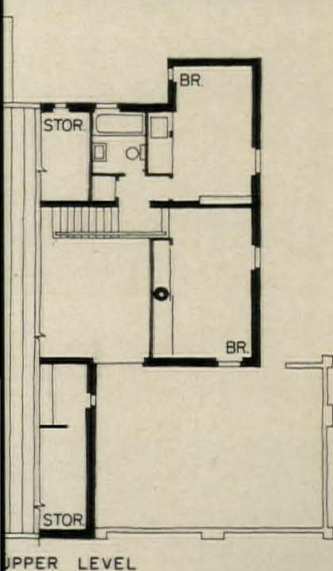


Hans Namuth photo

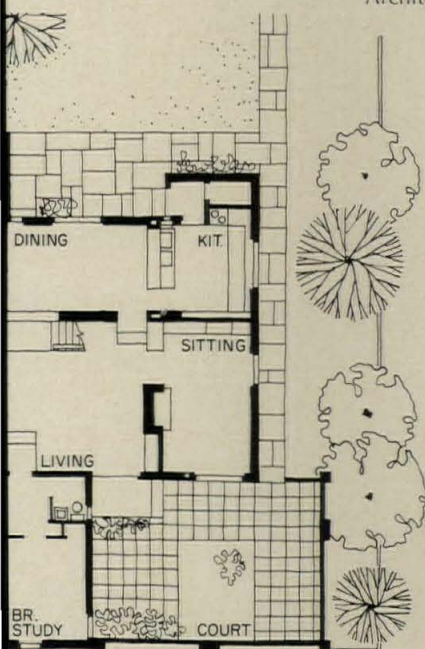




ENGLAND Although this house is entirely contemporary in technique, materials and use of space, it nevertheless captures some of the feeling and character of older craftsman-built cottages, and fits well into a traditional village scene. From the outside, it has an obvious, but non-imitative resemblance to black and white English half-timbered buildings, even though in this case walls are painted brick instead of white infill, and the trim and lintels are cast concrete rather than timber. Inside, exposed beams and brick walls and two-story living area are in line with contemporary idiom which does not deny traditional roots. Architect: Peter Aldington.

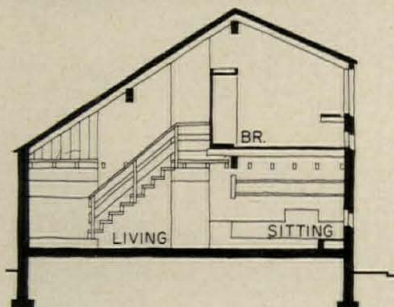


UPPER LEVEL



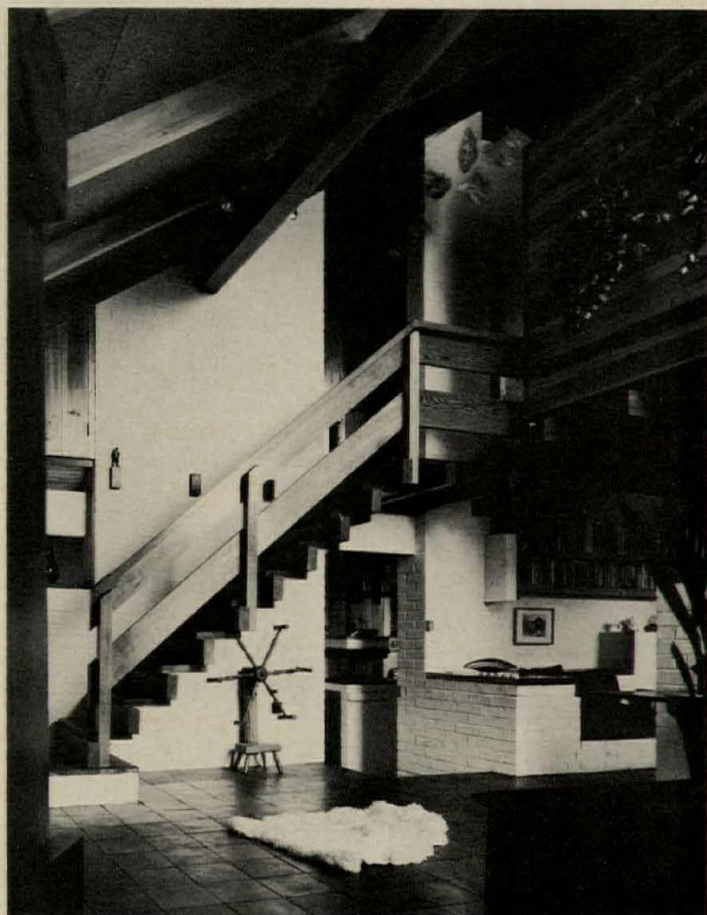
LOWER LEVEL

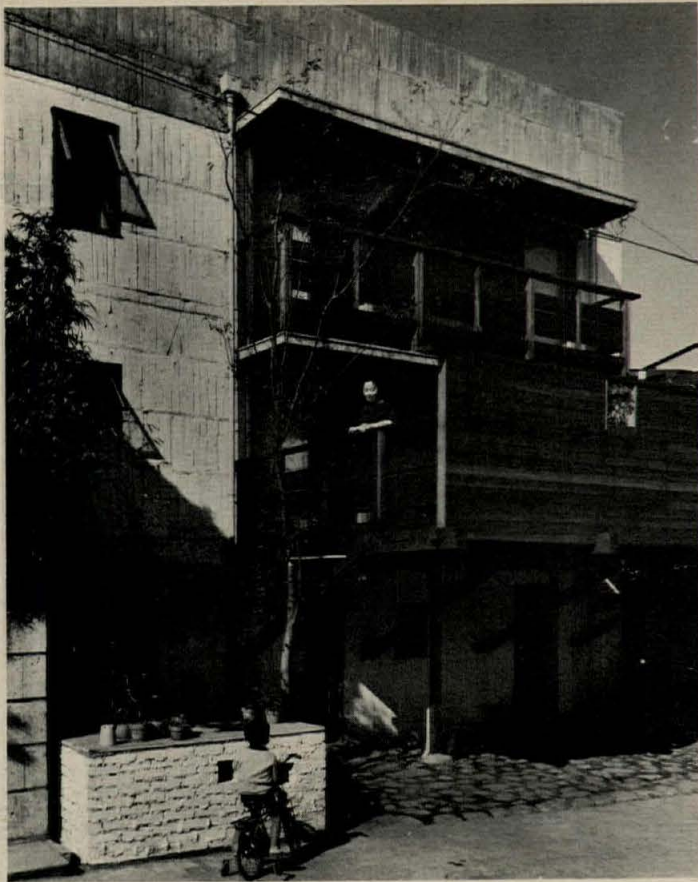
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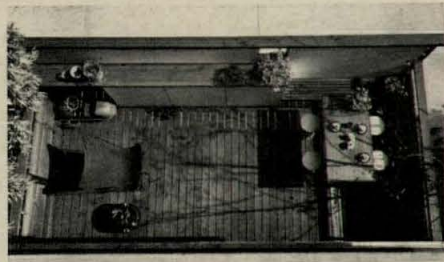
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Brecht-Einzig photos

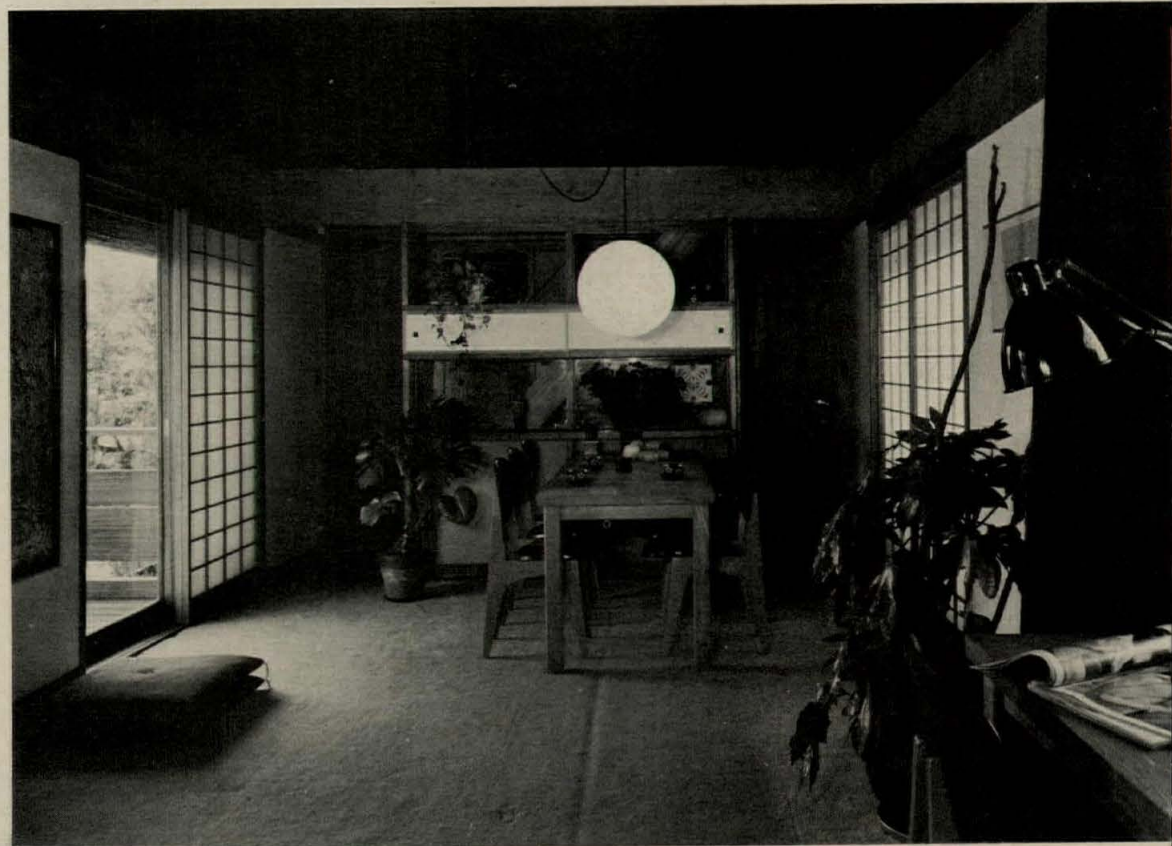
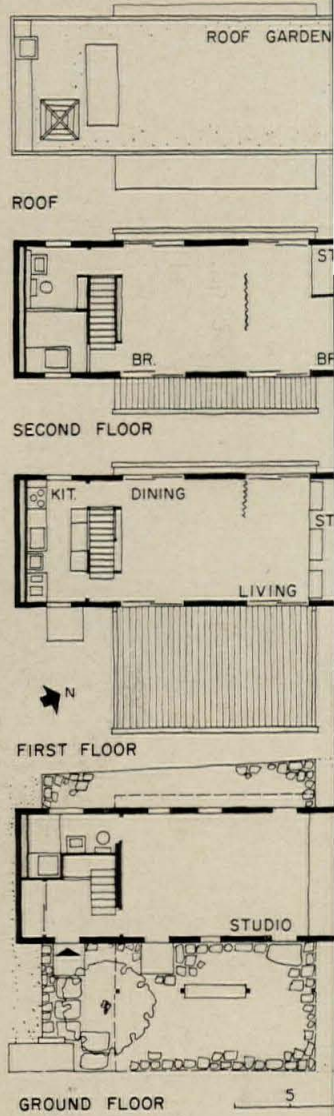




Osamu Murai photos



JAPAN Inspired by the need to maintain a relationship between the city dweller and the outdoors, the architect has managed to provide a number of open areas on a tiny lot in the congested heart of Tokyo. The entrance garden, terraces and roof garden all serve to bring greenery, space and air into a totally urban situation. An east-west orientation was chosen to take advantage of morning and evening sun and natural cross-ventilation. Storage walls and minimal, simple furnishings continue the Japanese tradition of "freedom of use and movement" within the house. Architect: Tadayoshi Fujiki.



APARTMENTS:

THE PROBLEM IS NOT JUST MORE SPACE FOR MORE PEOPLE

More, more, more. More garden apartments in the suburbs—"You'll Never Mow Another Lawn!" More "Better-Type-Luxury-High-Rise" in the cities, many rejoicing in "Olympic-Size Swimming Pools!"

What we need is not just more, but more quality—more fresh thinking, more delight along with the commodity and firmness.

We need more new design concepts that will make rooms something other than featureless boxes and allow apartment buildings to seem at home in their sites.

We need more new thinking in the struggle to house what architect Bertrand Goldberg points out is "a second generation of child-bearing families who have never lived anywhere except in public housing projects."

We need more new architectural and engineering approaches to the problems and opportunities of using the by-passed land in and near our cities (which we can no longer afford to bypass).

We need more concepts for creating a pleasant environment for our apartment projects—something meaningful and not just a plot of grass with a dirt line dug diagonally across it by the heels of frustrated children.

We need more new ways to express the idea of community on each floor, and in the total apartment complex.

We need more new apartments that are places for people to live, and not just places to store people. No architectural problem cries more loudly for attention.

Walter F. Wagner Jr.

New forms—new building shapes, new floor plans, new land uses—can do much to relieve the “drawers in a bureau” feeling so often associated with high-density housing. Sometimes, “new forms” seem only to be different for the sake of being different; but these examples seem to develop some new patterns for living, both in expensive housing (as below) and in lower-cost buildings



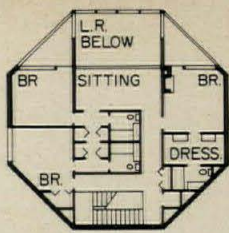
Merrywood: tiered clusters of houses create a new kind of environment

The land for this project—a former estate with beautiful, wooded land rolling down to the Potomac near Washington—was very nearly subdivided into a development of 46 houses on one-acre lots. In contrast, Victor Gruen's proposal, which has been accepted and financed (construction will begin early this year) has almost nothing routine about it:

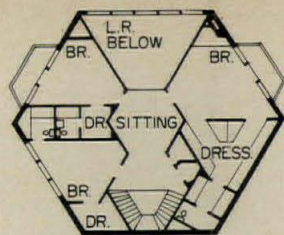
Forty-six hexagonal and octagonal houses—each two stories high—will be placed in groups made up of six or nine

units next to each other and in three tiers, one above the other (see section opposite). There will be six of these groups each on a promontory with beautiful views, and each, in Gruen's words, “. . . of such a size and shape that, on the one hand, they will fit organically into the landscape but, on the other hand, be significant enough to give drama and interest to the views from the river and surrounding areas.”

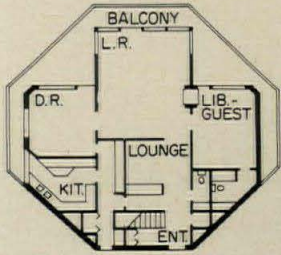
By fitting the houses to the land contours, Gruen has



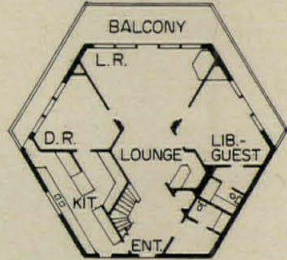
SECOND FLOOR



SECOND FLOOR

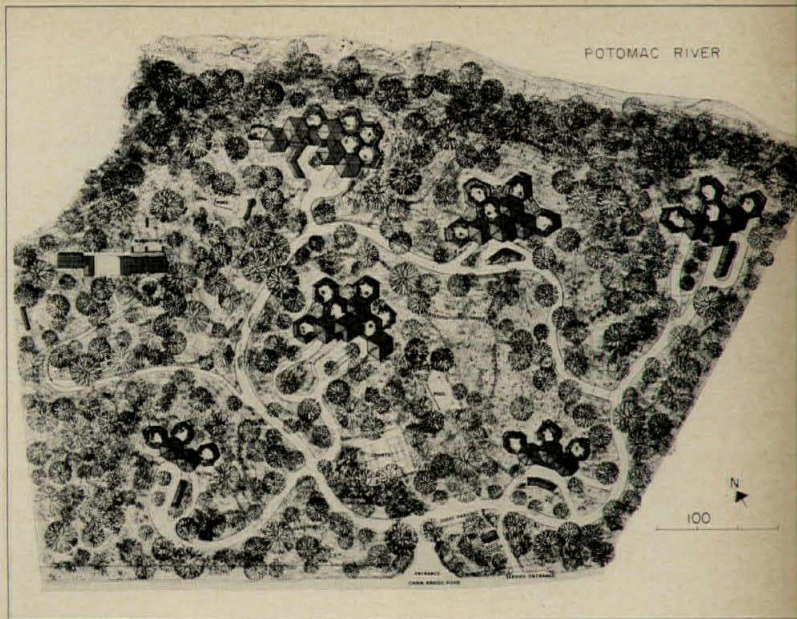


FIRST FLOOR

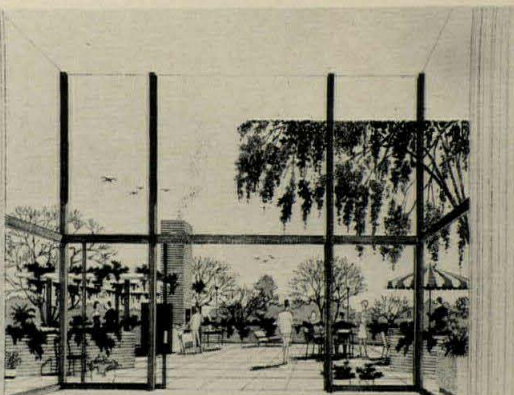


FIRST FLOOR

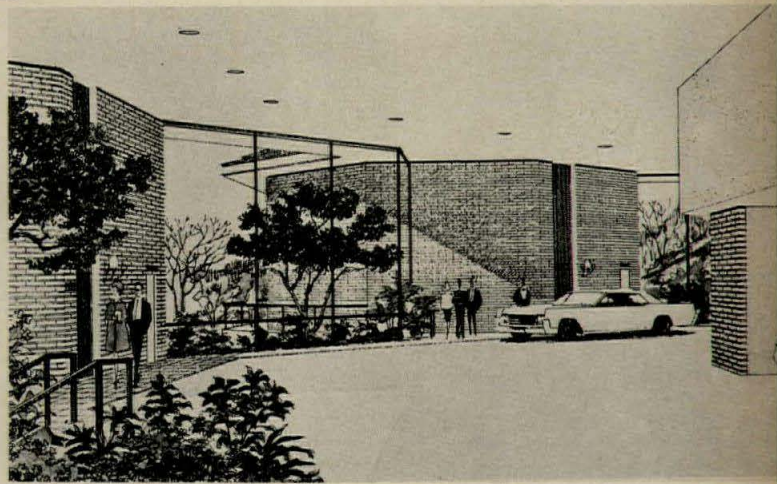
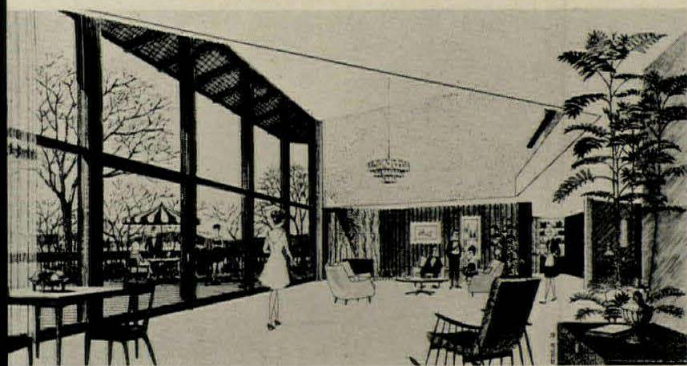
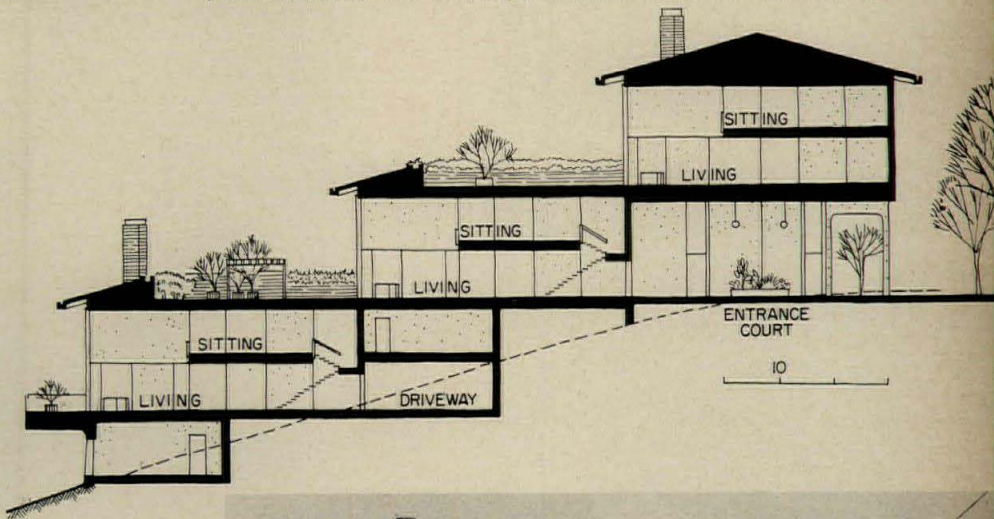
Both the octagonal and hexagonal plans create "pleasant spatial experiences," with the hexagonal perhaps the more dramatic. In either plan, the main rooms are oriented strongly to the downhill views.



The cluster plan minimizes space wasted in roadways, leaves most of the land in its natural state. Spotted through the greenbelts will be footpaths and bridle paths, swimming pools, and tennis courts for the owners.



The tiering of units provides broad "hanging gardens" outside the living room in both the octagonal houses, above, and the hexagonal houses, below, and—under the upper units—two-story-high entrance galleries, right.



managed to give each of the upper units huge terraces or "hanging gardens" on the roof of the units below. The lowest units will have broad decks. And all of these outdoor living areas will overlook the green spaces.

The hexagonal plan creates rooms of unusual shape, greatly varied scale and proportion. The central or "sitting room" part of the living room opens (at top in plans above) to a two-story, glass-walled section overlooking the terrace

and view. The octagon house, as its plan shows, has rooms of more conventional shape—but fits the cluster scheme.

Gruen sums up: "This approach should be adaptable not only to the planning of other private estates which are being dissolved, but to the development of metropolitan areas generally, and not just in relation to high-priced housing." MERRYWOOD, Fairfax County, Virginia. Architects and land planners: Victor Gruen Associates.



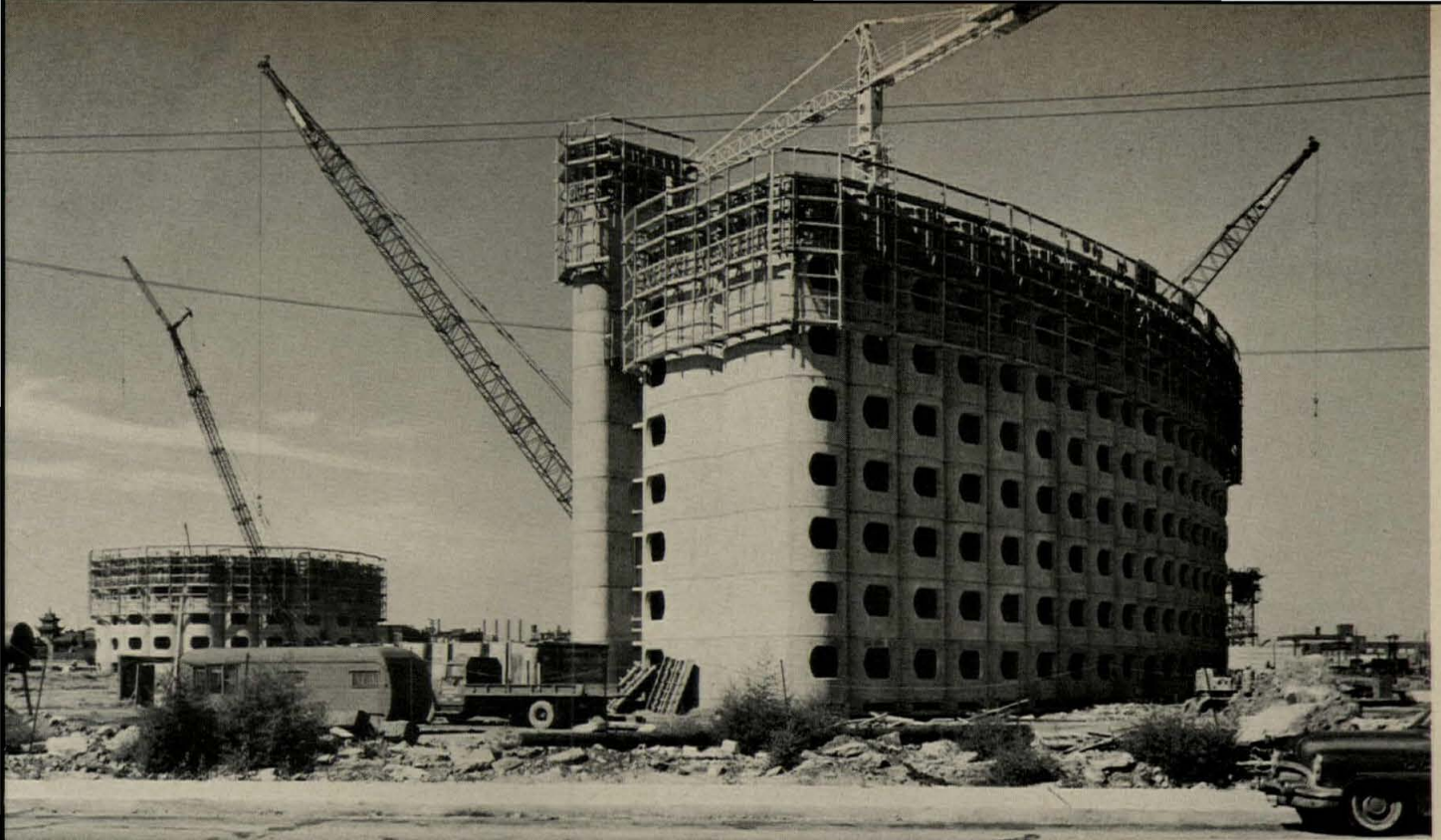
A new kind of public housing: new forms from new concepts

The design of this public housing began, says architect Bertrand Goldberg, with the fact that "we now face a second generation of families who have never lived anywhere but in public housing projects. I hope that the people who will be compelled by reason of poverty to live in these units no longer will feel that they are treated as the poor to be punished."

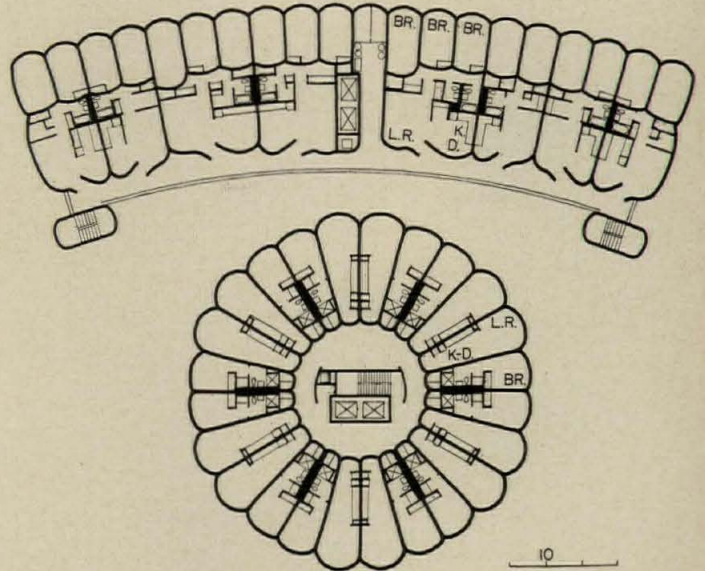
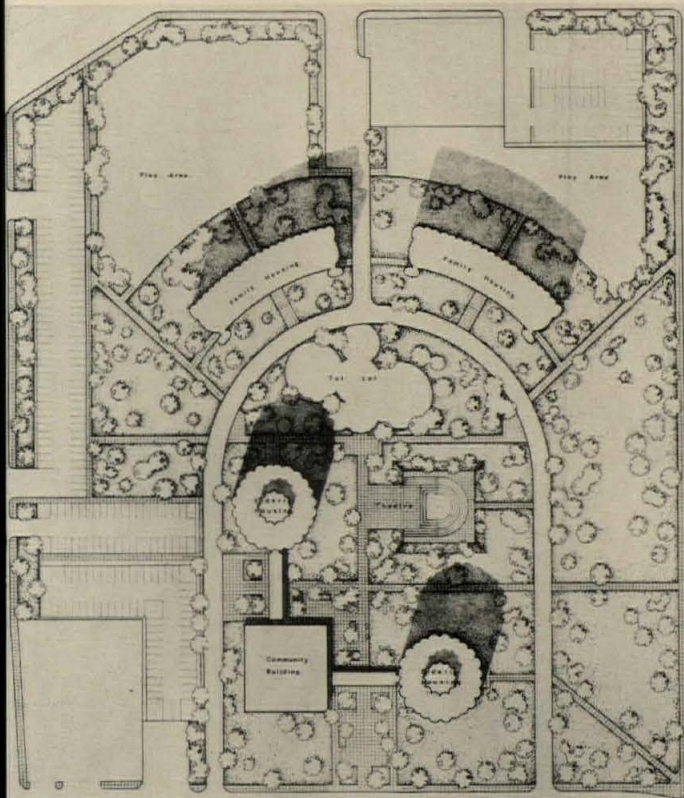
The site plan grows out of another social concept: "By

combining housing for both family groups [in the two curving towers] and elderly groups [in the round towers] we recognize that they are both members of the same society. . . ."

In the design of the buildings, by making use of concrete as the plastic material it is, Goldberg created "spaces without structural limits. . . . Here, housing becomes a series of moving and interlocked indeterminate spaces designed for the use of the individual."



"We were not only able to use concrete to delineate space, but by planning the space enclosures carefully, were able to create a structure at the same time." The elliptical windows express this monolithic design.



In both types of building, "the rooms seem larger than with the same minimum square footage in post-and-beam construction. The spaces are exciting, and living takes on a quality not possible in conventional buildings."

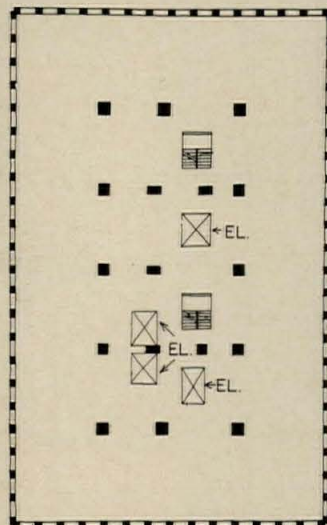
"Instead of assigned areas of activity in the site plan — the planner's signature of a compelling statement of 'you must,' the indeterminate site plan invitatively suggests 'won't you?'"

By "drawing lines around reasonable furniture layouts, still taking into account the maximum areas defined by regulation," Goldberg was able to offer fresh and flexible space "free of the customary monotony." One example: In the elderly housing, the entry to each apartment is through a common room in the core of each floor "where the interdependency of the elderly can be established as required."

This system of fluid relationships of space was not only

made possible by the use of concrete, but clearly expressed in the concrete structure. In total, Goldberg's design surely meets his own initial criteria: "The architecture must meet and recognize these indigent families—not simply store them."

LOW RENT HOUSING PROJECT — ILLINOIS 2-46, Chicago. Architect: *Bertrand Goldberg Associates*; landscape architect: *Alfred Caldwell*; mechanical engineers: *George Joerger & Associates* and *Joseph P. Bazzoni*; general contractor: *Paschen Contractors, Inc.*



Closely spaced exterior columns eliminated shear walls, permitted great planning flexibility.

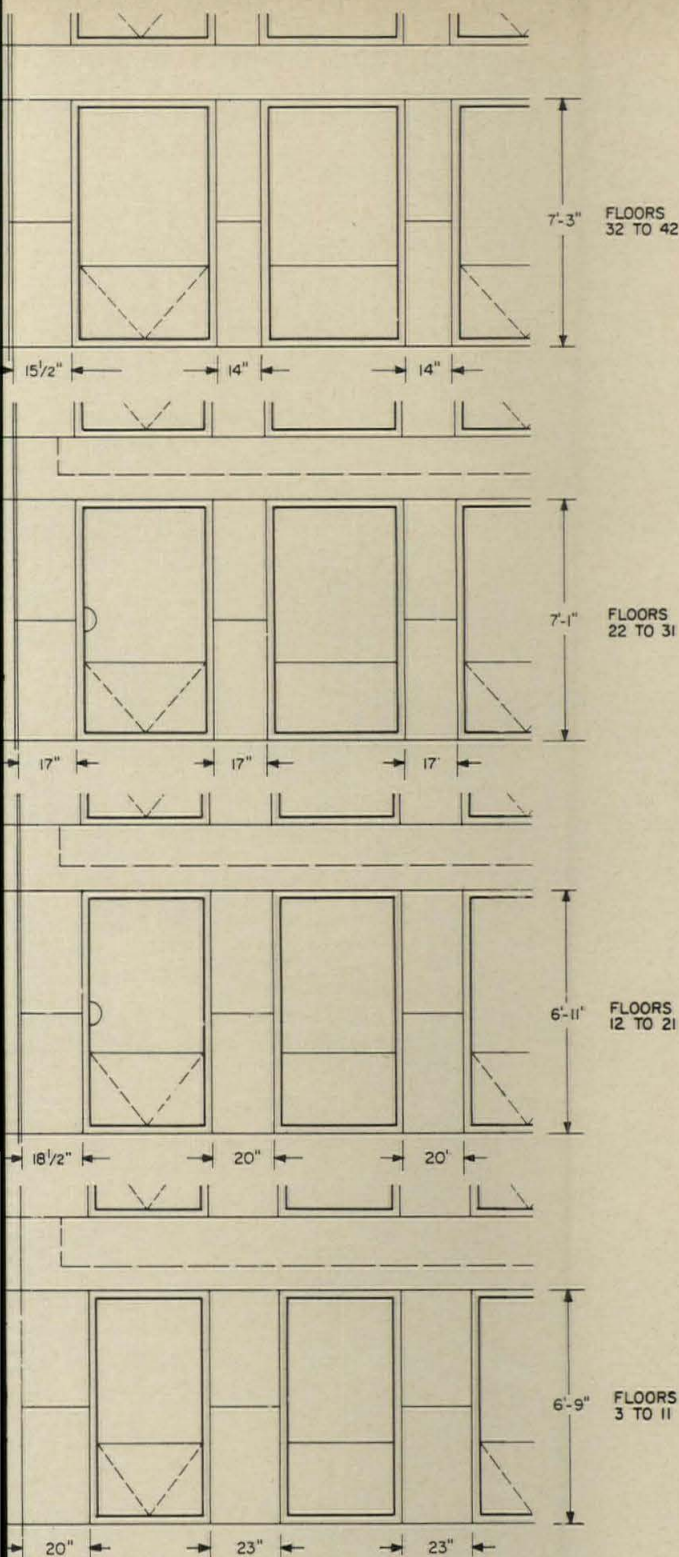
Sheer tower in Chicago: a design develops from engineering studies by computer

The site for this SOM-designed apartment is near the lake shore, amid apartments of 20 to 25 stories and adjacent to Mies' twin glass towers. To set the building apart from its neighbors to the maximum extent, a very slender reinforced-concrete tower was chosen as the best solution.

A considerable amount of lateral stiffness in both directions was required to resist the design wind loads without excessive sway (not over one six-hundredth of the height). A

normal solution would have required at least two shear walls extending the full depth of the building, and openings in the wall staggered at alternate floors.

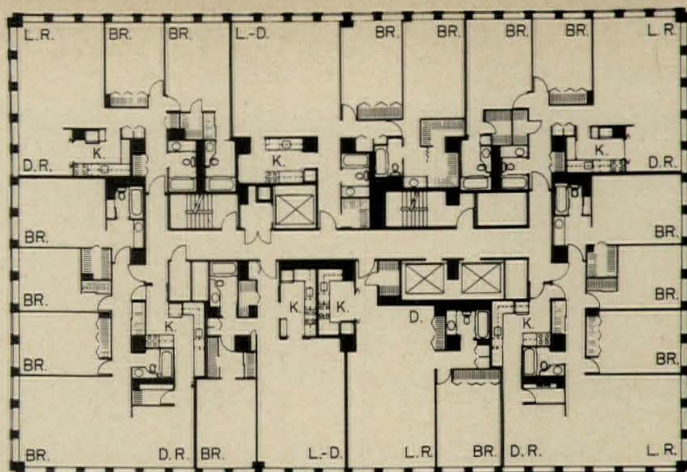
The approach taken was to develop a shear-shell covering the building. It takes the form of columns closely spaced (5 foot, 6 inches on centers) tied together with relatively stiff spandrels. This created, in effect, a rigid box—a solid shear-shell around the building with punched openings for win-



Design uses maximum window opening that still allows the wall to meet wind load and other structural requirements. Both columns and spandrels get progressively lighter—permitting bigger windows at the top.

Windows. This complex is supported on plaza and basement-level columns spaced 11 feet on centers through the use of a perimeter transfer girder at second-floor level.

SOM's computer was used extensively in developing this solution. An early design, with very small "punched holes" for windows, was shown by computer study to be overly conservative. Several modifications in column and spandrel proportions were analyzed, and the final solution was taken



Floor plans show excellent circulation pattern. Building has a total of 407 apartments—160 efficiencies, 122 one-bedroom units, 83 two-bedroom units, and 42 three-bedrooms. Larger apartments are on upper floors.



Detailing of the building shows the simplicity and precision that mark most SOM designs. The building is clad with Roman travertine, windows are grey glass. Lower floors have complete shopping facilities.

to the point where column widths decrease sharply from the lower to the upper floors resulting in higher and wider windows (see drawing above, left).

The result: perhaps one of the most sophisticated and disciplined of SOM's sophisticated and disciplined designs. DEWITT-CHESTNUT APARTMENTS, Chicago. Architects and engineers: Skidmore, Owings & Merrill; developer: Metropolitan Structures, Inc.; contractor: Metropolitan Construction Corporation.

New solutions to hillside sites will become more and more important as easy-to-build-on land in crowded urban areas becomes more and more scarce. This apartment complex shows that, while the design problem is far more complex, hillside sites may make even more sense for high-density housing than for single-family housing.



Norwegian terrace housing: high-density on an "unbuildable" hillside

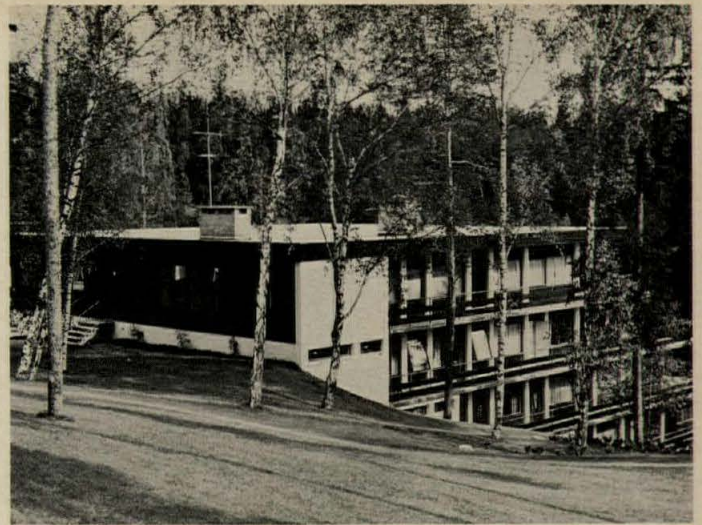
Olav Selvaag, a well-known Norwegian engineer and builder, conceived this complex of buildings cascading down a mountainside near Oslo, a site that had long been considered "inconceivable for building purposes."

With the architectural firm of A/S Selvaagbygg, Selvaag worked out the imaginative solution shown in these photos—a total of 54 apartments in six separate tiers. The "tallest" set of apartments (right in photo above) has 12 stacked units

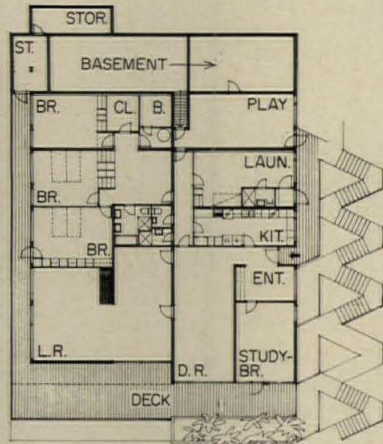
above a lowest level of parking—which means some families must walk up or down as many as six stories. While this would be unacceptable to American renters, the problem could of course be solved by additional access roads cut across the hillside (or perhaps even by a funicular).

From a structural point of view, the highest "stack" of apartments above the foundations—that is, in any single vertical line—is five stories.

F. Welhaven and Teigen's Photo studio

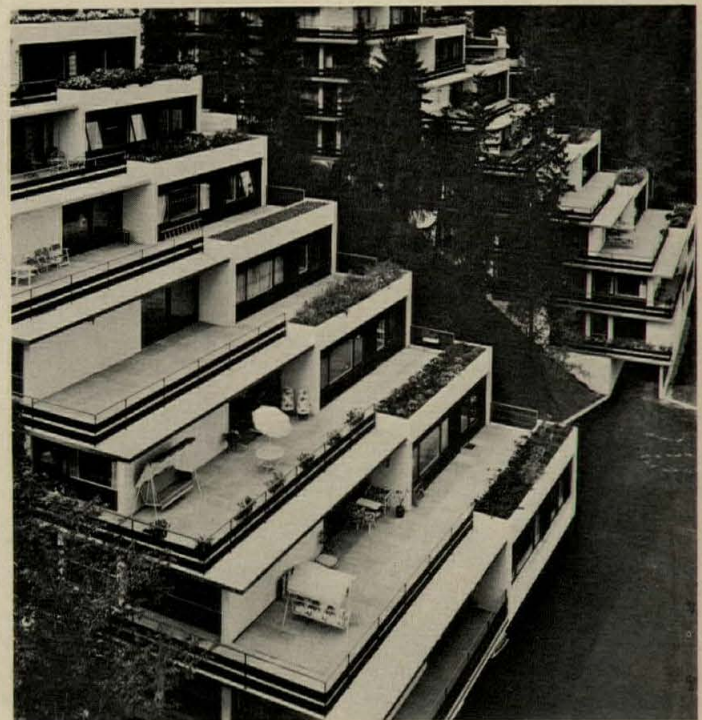
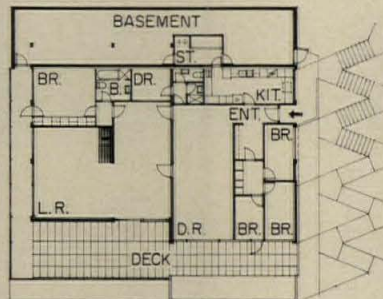


View from access road shows the broad windows, opening to a walkway, on the bedroom side of the apartments. Stairs leading to lower units are on other side. Finish is white stucco, with black-painted woodwork



Floor plans take good advantage of the magnificent view. While again differing from American standards in some respects, they waste little space in hallways, yet no room must be crossed to reach another.

The terraces all have built-in planting boxes which seem (with one exception) to be effectively used. Boxes and overhangs give sufficient privacy to terrace below for even some Scandinavian-style sunbathing.



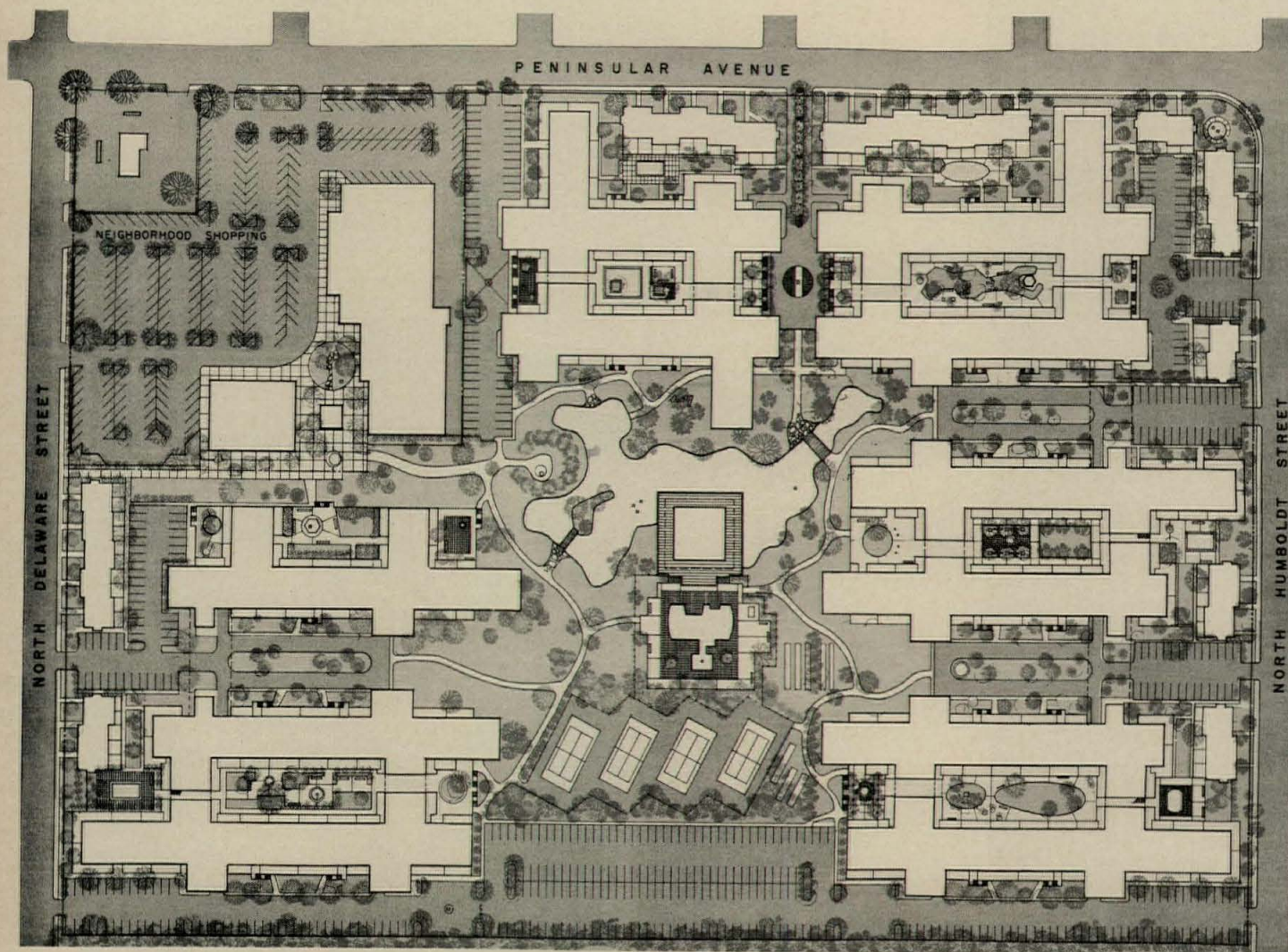
Each apartment in the complex occupies one whole floor, and each, as the photos show, has a large terrace or "hanging garden" on the roof of the unit below. The size of the units varies—in accommodation to the varying slope of the hillside—but they are all big by American standards. The typical small apartment shown in the drawing above has 1,782 square feet of floor space; part of it, to be sure, in "basement" (but eminently useful) space on the blank wall against

the hillside. The larger apartment shown has nearly 3,000 square feet. There are, of course, spectacular views from all rooms, and most open to either the broad terrace or to narrow walkways that run down the sides of the buildings.

In all, these should be exciting apartments to live in!

OVRE ULLERN TERRASSER, Ullernas, Oslo. Architects: A/S Selvaagbygg; engineer and contractor: Olav Selvaag.

New kinds of environment must be created for higher density housing if we are to combine the demand for more efficient use of close-in land with the demand for better and better ways of living. Below and on the following seven pages are four examples of thoughtful efforts to make high-density housing more than just a place to live, but a neighborhood for living.



Woodlake: "a small community complete within itself..."

Statements by architects Wurster, Bernardi, and Emmons and landscape architect Lawrence Halprin sum up the design concepts of this 30-acre, 944-unit complex: "By pooling community land, large open spaces are made available for common use, and each family thus has the use of recreation areas virtually at its front door . . . Rather than scattering the apartment buildings about in this park area, we have kept it as free landscaped space, and have created apartment clusters.

"The small neighborhood service shops [upper left in plan] add to the self-sufficiency of the development . . .

"In a planned community . . . the automobile, which intrudes almost everywhere in our lives, can be kept out of the center of the development, leaving it free for tenants to stroll and to play without fear of traffic. Parking areas and access roads to parking for each tenant beneath the major buildings are confined to the edges of the land . . ."



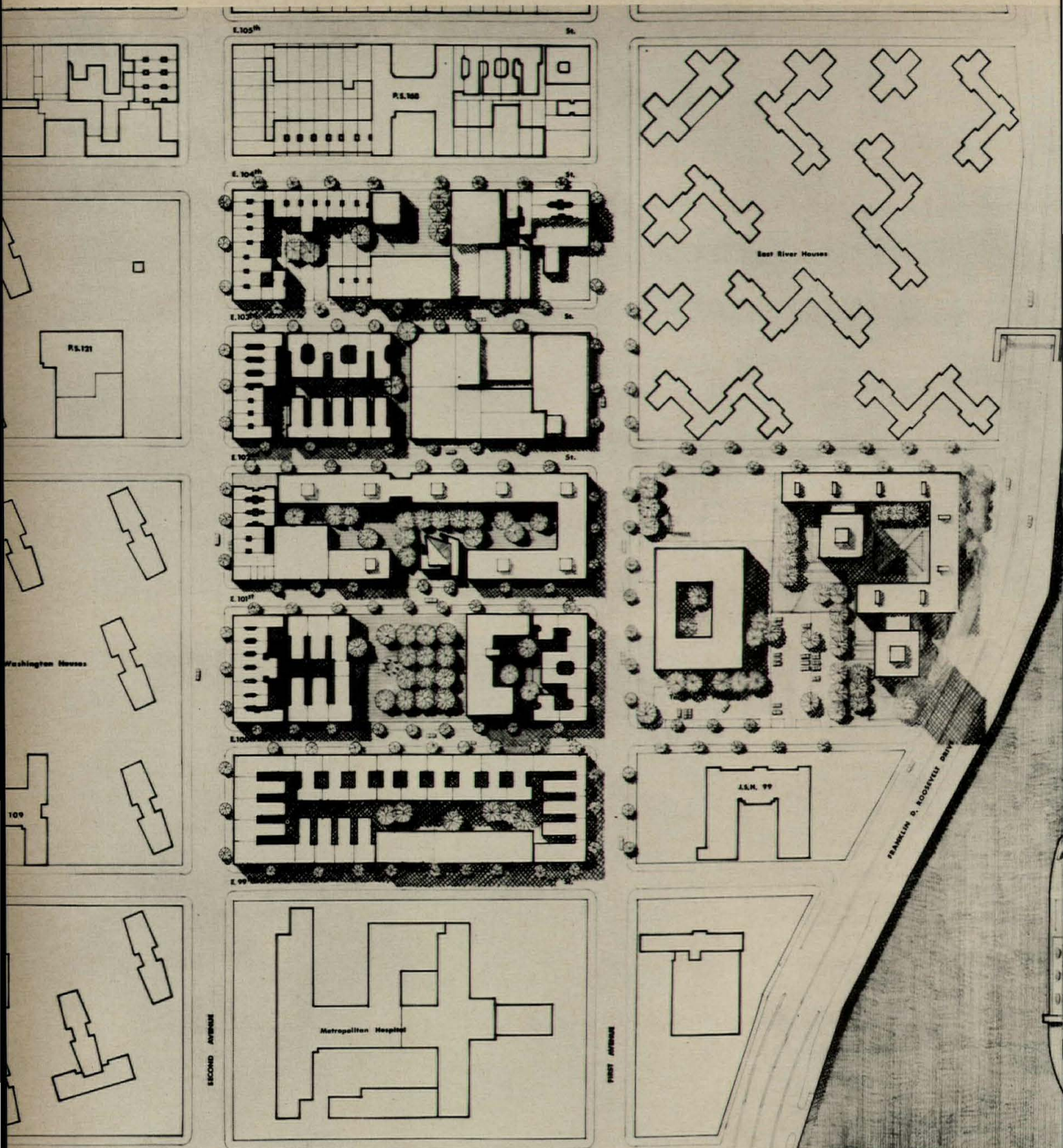
The park area, built around the central lake (see photo above and plan) has four tennis courts, a pitch-and-putt course, a large swimming pool, and a two-story pavilion (below) with club and exercise rooms. Five other swimming pools are spotted in the courts between buildings (right)



The large central park and recreation area (see plan), plus the landscaped courtyard and swimming-pool areas between buildings, cover nearly half (13 acres) of the 30 acres. The shopping center covers just over four acres, driveways and parking areas about five. The 944 apartment units—in six two- and three-story buildings and a series of perimeter townhouses—are concentrated on just under eight acres. Thus this complex creates an environment that is a complete neigh-

borhood, and has more of the feeling of a resort than a residential area of 30-families-per-acre density.

WOODLAKE, San Mateo, California. Architects: *Wurster, Bernardi, and Emmons*; structural engineer: *David Alan Welisch*; mechanical engineer: *G. L. Gendler and Associates*; electrical engineer: *Edward S. Shinn and Associates*; landscape architect: *Lawrence Halprin and Associates*; contractor: *Williams and Burrows*; owner and developer: *Gerson Baker and Associates*.

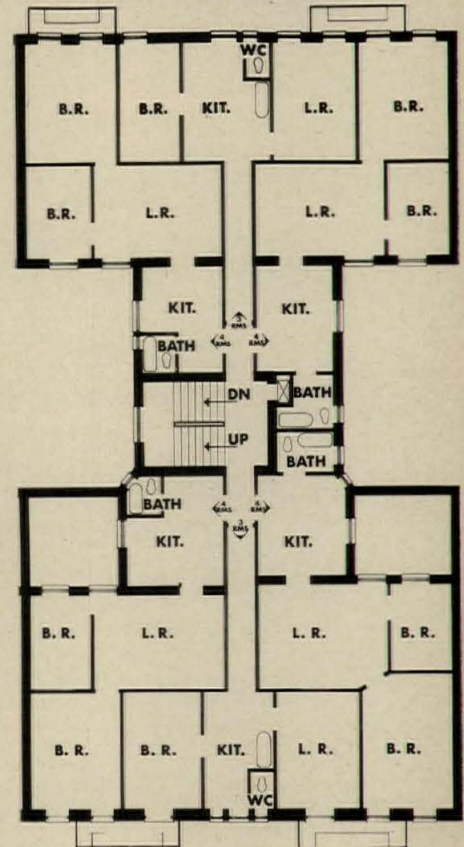
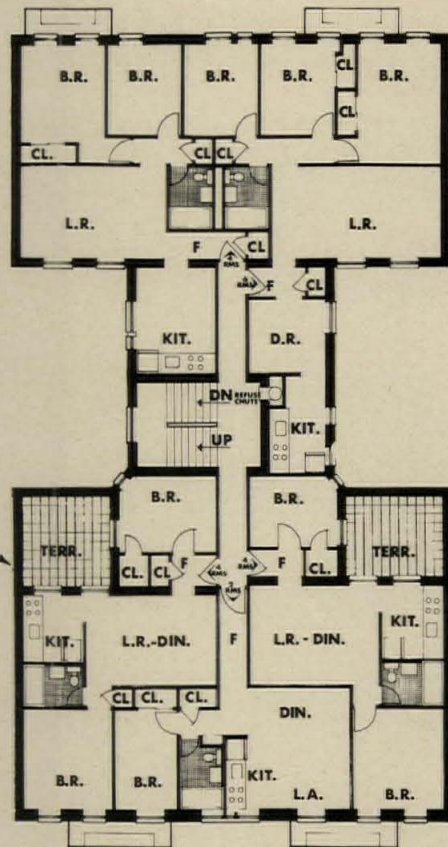
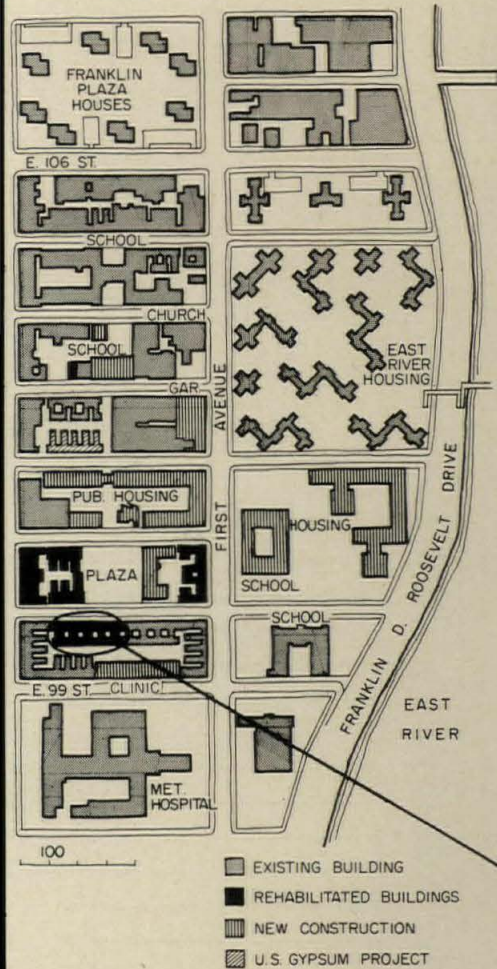
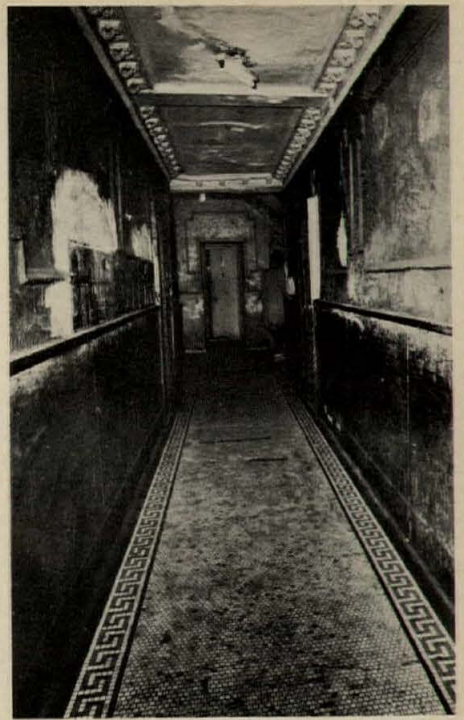


Metro North: a slum community's plan for creating its own new environment

Above is the master plan for the rehabilitation of some of the worst blocks in New York City's East Harlem. One of the things that makes this program extraordinary is that it was devised and is being supervised by neighborhood organizations—Metro North Association, an "umbrella organization" coordinating activities, a tenant-resident committee organized on a building-by-building basis, a Roman Catholic church, a Protestant parish, and a settlement house. With the sponsor-

ship of the Kate Maremont Foundation, which has pioneered housing rehabilitation in several cities, the Association retained Whittlesey & Conklin as architects and planners.

Working closely with the neighborhood groups, Conklin developed the master plan as "a new village," with many buildings—new and rehabilitated—turning inwards to grassy courtyards; a scheme in great contrast to much of the high-rise public housing in the area which commands an unex-



Typical rehabilitated floor will have one two-room, one six-room, and three four-room units. Refuse chute will encourage cleanliness.

Old floor plan had almost no mix of apartment size, encouraging over-crowding. Most units had no closets, bathtub in the kitchen.

Master plan envisions the seven-block area as "a new village." It would include rehabilitation of over 600 units in five of the blocks; the building of 120 units of new non-public housing and a six-story, 275-unit public housing project; a new parking garage structure, a narcotics rehabilitation center, a new public elementary school, and a large central plaza. Also in the plan: new, non-public, low- and high-rise river-front housing with 350 units, and the Church of the Resurrection (designed by Victor Lundy).

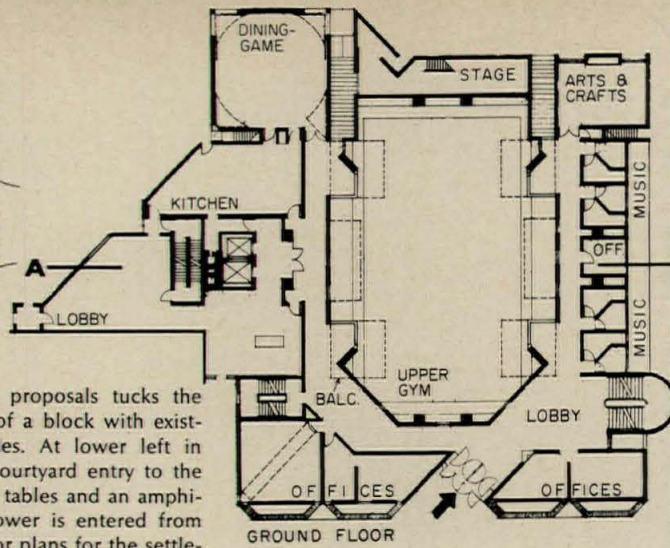
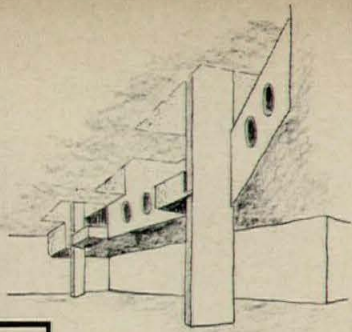
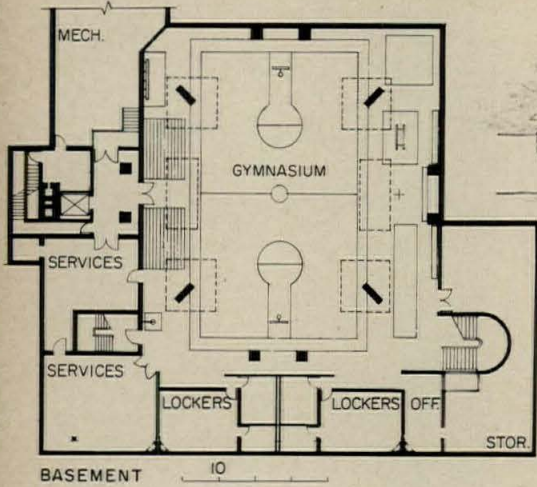
celled view of some of the country's sorriest real estate.

As a physical start on the project, Conklin has redesigned five buildings on 100th Street, and construction is underway. These buildings are six-story New Law tenements with 33 units per building, or a total of 165 apartments. Conklin's design of course involves major repair work, but — most importantly—he has developed within the existing framework of walls and stairwells a much better floor plan, creating a better

mix of apartment sizes and more pleasant room relationships within each apartment (see plans above).

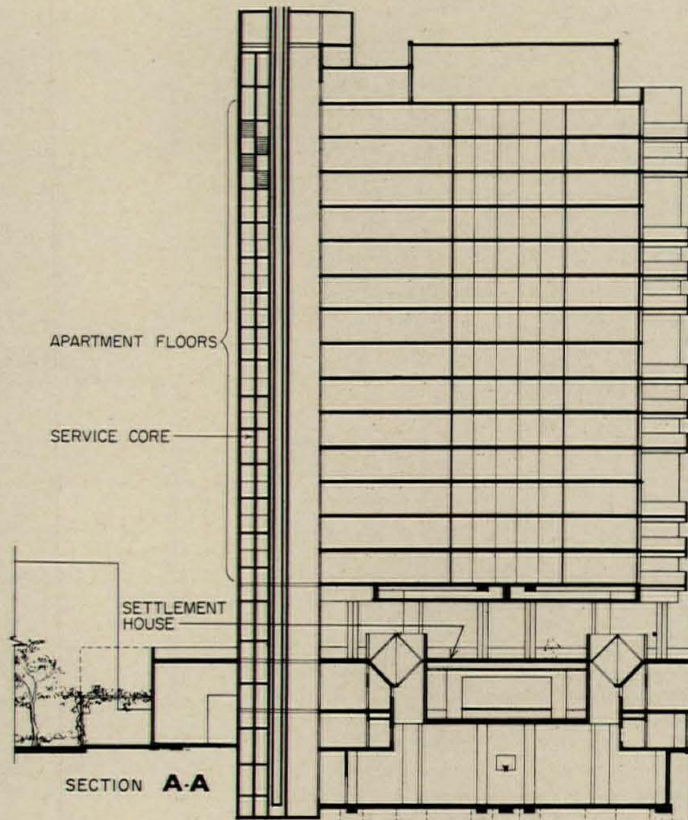
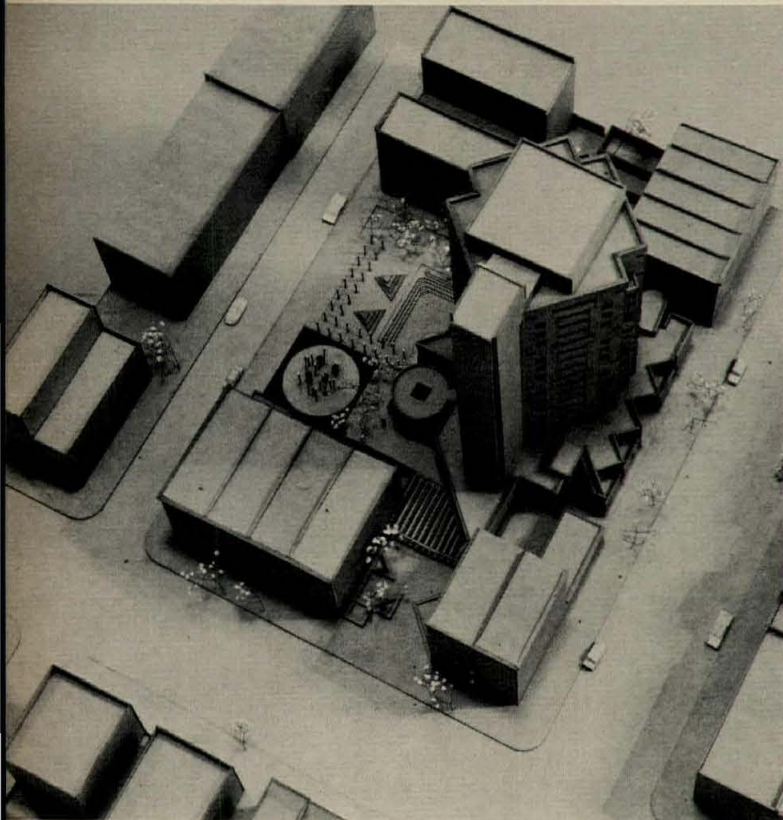
A second pocket of rehabilitation—six buildings on 102nd Street—has been undertaken as a private project by United States Gypsum Company (see *The Record Reports*, page 36).

METRO NORTH, New York City. Architects and planners: *Whittlesey & Conklin*; sponsor: *Kate Maremont Foundation*; mechanical engineers: *Wald & Zigas*; general contractor: *Blitman Construction Co.*



The first of Katan's two proposals tucks the complex into the center of a block with existing housing on both sides. At lower left in the model photo is the courtyard entry to the main outdoor space, with tables and an amphitheater. The apartment tower is entered from this courtyard. Above: floor plans for the settlement house levels. Far right: typical apartment floor plans. The elevator core is outside the building line to permit open spans for the gymnasium and auditorium below. The corridors were brought in "diagonally" and the balconies set at the corners "to create non-geometric rooms with many perspectives." This variety and distraction is especially important for the elderly, who will be spending so much of their time at home.

Gil Amiaga photos



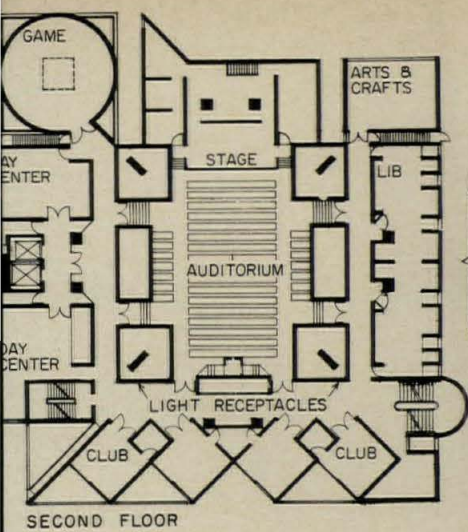
Another East Harlem project: minimum standards vs. minimum decency

This proposal by designer Roger Katan for a combined complex of housing for the elderly and neighborhood settlement house explores one fresh planning idea after another in an effort "to create a core of decent environment for the whole neighborhood — to create minimum decency within regulated minimum standards." Actually, Katan has two alternates:

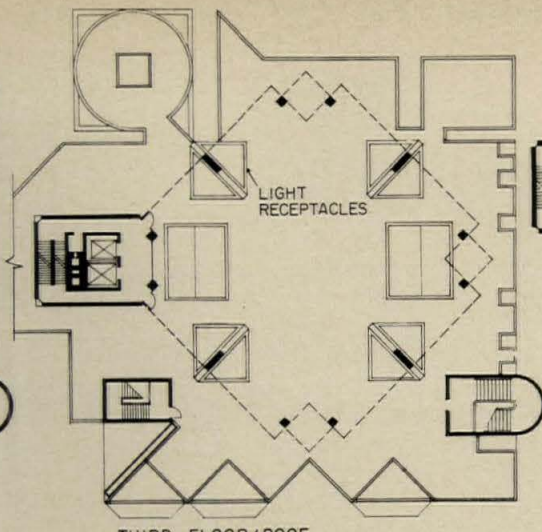
The first, perhaps more ingenious because it must fit a very constricted site, uses the settlement house as a low

base. Stacked above it, to preserve a maximum of open space on the site, are the apartments.

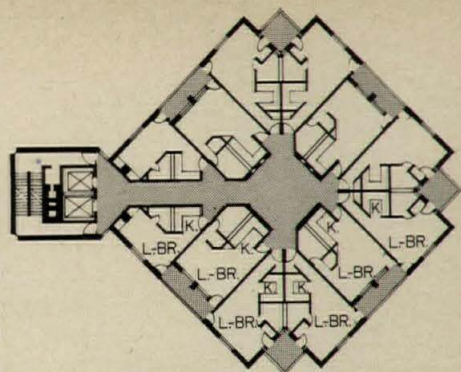
At the core of the settlement house, within the structure of the apartment tower, are the gym and auditorium (see plans at top, section above). They are encircled by an interior street with windows and balconies to allow residents and visitors to view activity. On the other side of this "street" are the club and activity rooms, a dining room and a library.



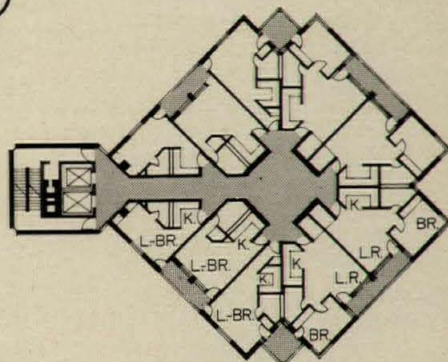
SECOND FLOOR



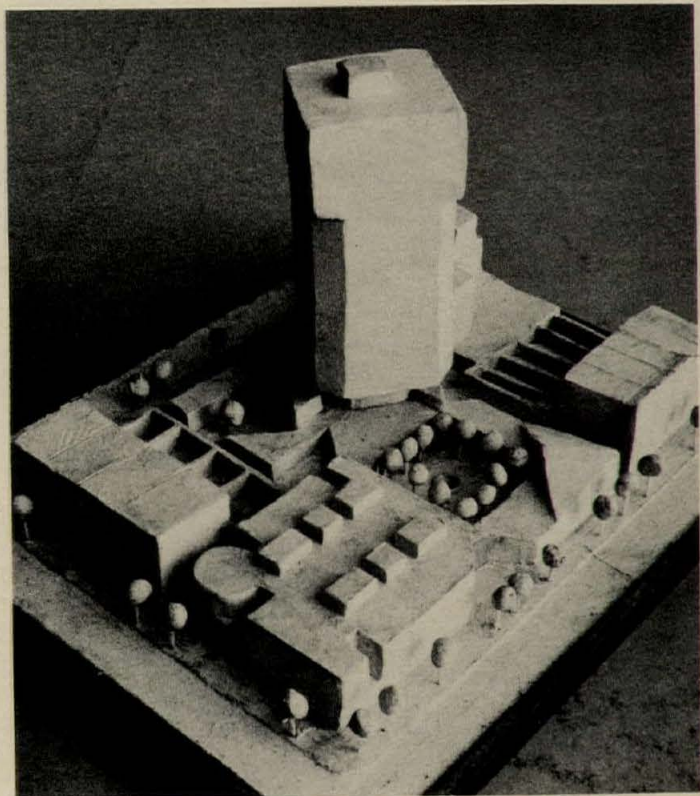
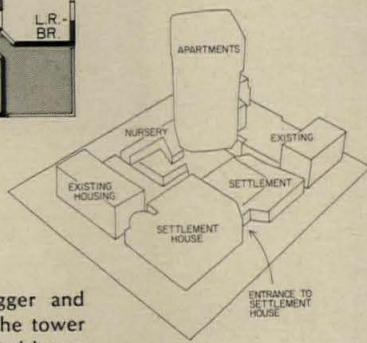
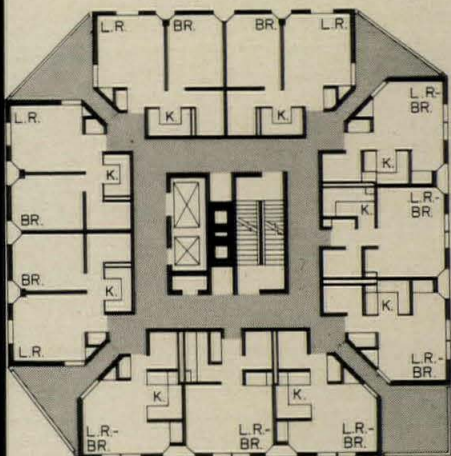
THIRD FLOOR/ROOF



TYPICAL ALTERNATE APARTMENT FLOOR



TYPICAL APARTMENT FLOOR



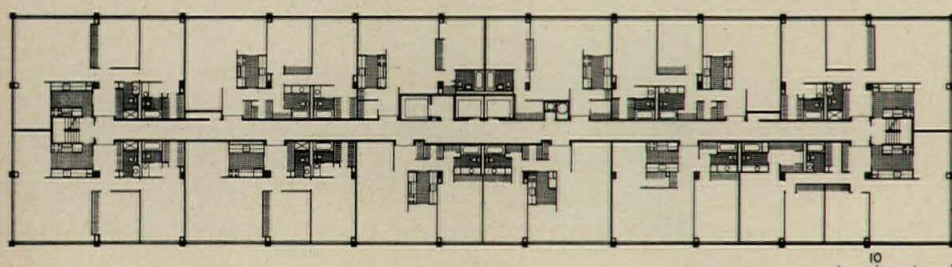
Katan's alternate scheme creates bigger and more pleasant outdoor spaces. Here, the tower service core is at the center, surrounded by an "internal street" lighted by and open to the funnel-shaped balconies. All of the balconies are shared by all of the units "to encourage a feeling of village living on each floor."

Upstairs, the apartment floors offer a compact diversity of private areas and group areas (the foyer at the core of each floor, and the balconies—all shared by neighbors).

The alternate scheme (see model photo and plan above), which is proposed if two existing houses on the corner of the site can be razed, creates a more open and pleasant arrangement of ground-level spaces, and more apartments (190 units versus 165). The settlement house will have its own court-

yard area, separate from the outdoor facilities for the elderly, and there will be space to add a nursery to the complex. In this case, Katan proposes to set the apartment tower just one floor above grade—and offers floor plans which, while quite different from his first proposal, have equally intriguing spaces.

LA GUARDIA MEMORIAL HOUSE, New York City. Design consultant: Roger Katan, DPLG; architects: Katz Waisman Weber Strauss Joseph Blumenkranz.



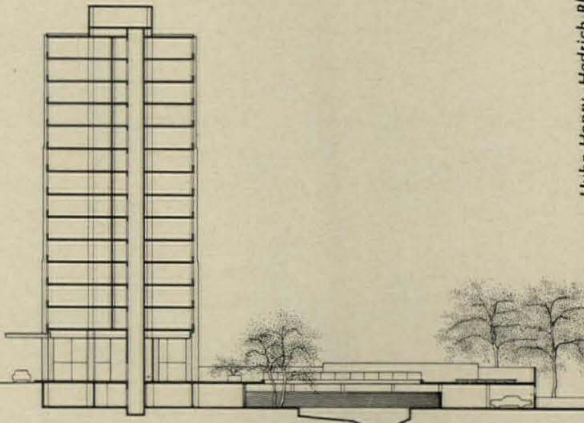
There are 165 apartments, varying from efficiencies to three-bedroom, on the 13 floors. Living areas are well buffered from corridors.

A Mies apartment creates its own environment in a residential neighborhood

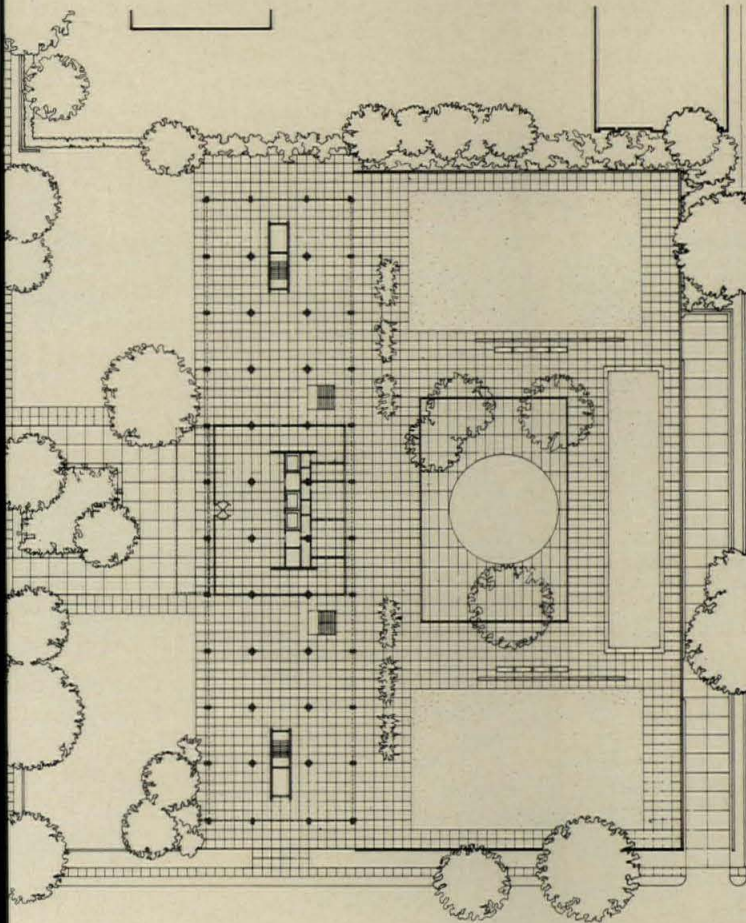
Although it stands on a busy and important thoroughfare leading to downtown Baltimore, is surrounded on three sides by large and well-landscaped houses, and faced on the fourth side by two high-rise buildings, this new apartment—by its severe and elegant design—establishes its own very private environment.

This privacy begins with the basic concept—a free-standing tower set on a platform. The tower mass is placed 100

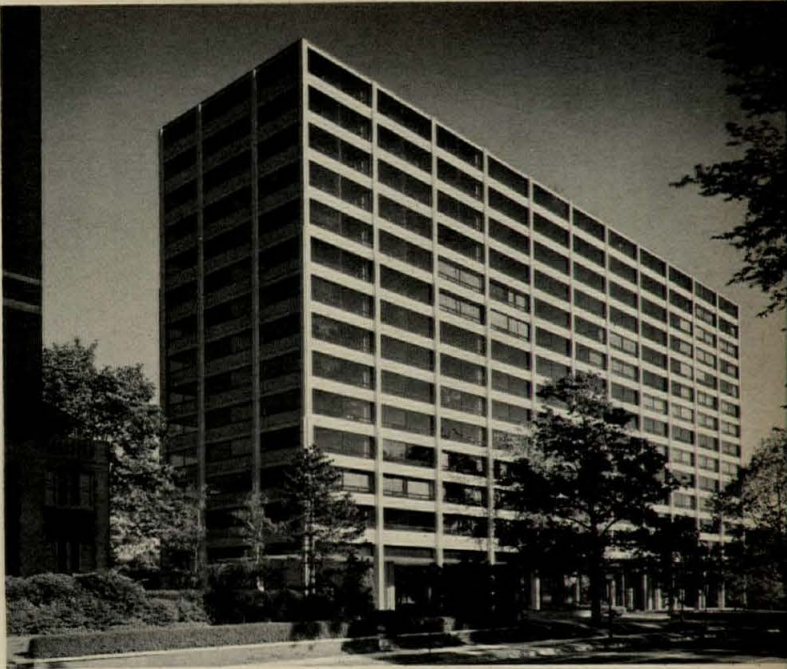
feet back from the street and raised 20 feet above the plaza “to create a visually unobstructed feeling of openness and space for the passerby, and a sense of isolation and privacy for the apartment tenants.” A small central portion of the ground level is glass-enclosed—creating a lobby with a central elevator core, lounges and reception desk. A mail-room and management offices are set in behind the elevators. Outside the enclosure are two symmetrical stairwells.



The gentle slope of the site raises the lobby-level outdoor plaza above grade at the rear. Below, surrounding the swimming pool and recreation court, are parking spaces, delivery areas, and mechanical services.



The site plan and, at right, the exterior and its detailing are equally disciplined and patterned. Photo at right shows panels of buff brick set below the broad window and used to enclose the stairwells.

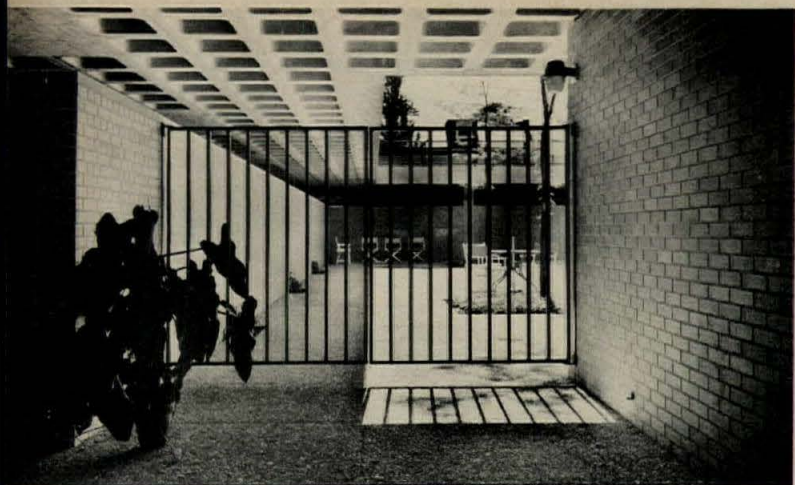


The paving which begins under the tower continues to the rear to create a huge plaza (see drawings above and photos, next page) with raised planting beds and free-standing walls. In the center of this plaza is an 80- by 100-foot well overlooking a circular swimming pool and an additional outdoor area. Both of these outdoor areas are enclosed for privacy with solid walls.

The building itself is reinforced concrete in a precise

and finely detailed pattern. The columns project beyond the glass line, but step back as column loads decrease. The openings in the framework are filled with panels of buff face brick and extruded black window frames with gray-tinted glass.

HIGHFIELD HOUSE, Baltimore. Architect: *Mies van der Rohe*; structural engineer: *Farkas and Barron*; mechanical engineer: *Cosentini Associates*; developer: *Metropolitan Structures, Inc.*; contractor: *Metropolitan Buildings, Inc.*



Below the elevated plaza, the recreation and pool area is walled off from parking and mechanical areas. Light and air stream down into this area from the well above.



On the same level is a large recreation room, separated from the pool area by this broad wall of glass. In good weather, this room can be opened to the outdoors. Note black framing around glass.

Hube Henry, Hedrich-Blessing photos

The above-grade plaza is isolated from the neighborhood by high walls. Walls of planting beds and free-standing benches provide plenty of seating area. Paving is a warm buff color.



Essential building services cited in FPC blackout report

The Federal Power Commission's report of the recent Northeastern power failure includes strong recommendations for the provision of auxiliary power for all "civilian services which are deemed so essential that they cannot tolerate any interruption, that is for which 99.9+ per cent is not adequate." Hospitals, airports, tunnels, drawbridges, railroad and subway stations, some bus terminals and basic communications are mentioned specifically in the report. The Commission recognizes that in most cases the cost of a full auxiliary power supply may be beyond its value, but suggests that in many cases it would be feasible to provide a degree of protection to the public while system power supply is cut off. Thus, even if it is impracticable for subways to provide an alternative power supply for train operation, they should at least develop a subway evacuation scheme which would make the risk of interruption tolerable. Such a scheme would involve auxiliary lighting facilities for stations and tunnels.

Elevators are regarded as a special problem. Ideally, the Commission recommends, auxiliary power sufficient to move at least one elevator at a time to evacuate passengers should be provided, but at a minimum, elevators should all be equipped with mechanical cranks or levers so that they can be moved manually if stalled between floors in a power outage.

In England, the British Standard on elevators requires that elevators be equipped with a mechanical device so that the elevators can reach the nearest floor in case of a power failure. One manufacturer uses a long screw attached to

the sheave of a gearless elevator which an authorized person can turn to move the elevator slowly. The screw is self-locking, so there is no chance of the elevator dropping. In this country, in those cases where the elevator can in fact be moved, this requires a trained mechanic to release a hand brake and another to turn the sheave.

Building research to grow at Bureau of Standards?

The National Bureau of Standards plans to initiate a study this year on whether or not there should be a national system for considering innovations in construction technology and for carrying new discoveries into action.

Speaking before the annual meeting of the Structural Clay Products Institute last November, Dr. A. Allen Bates, chief of the building research division of NBS, announced this move and stated his conviction that the United States must "feed into" the current world effort in building research.

For one thing, Dr. Bates feels that the U.S. has not kept up with other countries in the field of fire technology. Earlier last year, the Bureau outlined a proposed 10-year program which would include fire research on building elements, fire pits for study of spread and control of open fires and special facilities for studying the spread of fires.

Bates noted that the clay products organization and NBS have been discussing joint studies in the field of fire technology.

The 10-year program would also include research into architectural acoustics, climate exposure, mechanical and electrical systems and structural systems.

Advising the Bureau on its program of building research is a 13-man committee headed by Dr. R. A. Hechtman, formerly a professor in the school of engineering and applied sciences at George Washington University, and now a consulting engineer. Members of the advisory group include representatives from building product manufacturers, educators, contractors, architects and consulting engineers.

How to design houses that will weather hurricanes

About four times a year, on an average, parts of the United States are assailed by hurricanes which wreak havoc in residential areas. A report just issued at the U.S. Forest Products Laboratory, Madison, Wisconsin, suggests that a very high percentage of this damage could be avoided if wood-frame buildings were more carefully constructed with suitable materials and proper fastening methods.

The report "Houses Can Resist Hurricanes" is the result of a study of hurricane damage to man-made structures over a period of years. The authors of the study, L. O. Anderson, research engineer at the Laboratory and Walton R. Smith, assistant director of the South Eastern Forest Experiment Station at Asheville, North Carolina, conclude that "the most severe damage to structures in hurricanes is caused when foundations fail or the structure is torn loose

THIS MONTH'S AE SECTION

Sydney Opera House: engineers' view	175
Underground residential distribution...	181
Building Components: new keying system improves security	189
Product Reports	191
Office Literature	192

from its foundation. Next in severity is roof failure caused by improper ties between the structure and the roof. Less severe, but of tremendous monetary loss, are failures in roofing materials, failures in siding, broken windows, loss of porches, garages, steps, chimneys and minor appurtenances such as television antennas."

The report goes on to give details of foundation, construction, materials and fastenings which will provide the highest possible level of hurricane resistance. The use of concrete block foundations is warned against in locations where there is danger of tidal waves. If concrete slab foundation is used flat on the ground, deep reinforced concrete footings must be provided or the building is likely to be undermined by water, particularly in sandy areas. Detail drawings of recommended types of foundation, fastenings, bracing and sheathing methods are given, and a section is included summarizing existing building codes in hurricane areas. The authors suggest that most existing codes need clarification in the form of illustration of specific construction details to make them useful to the ordinary house owner as well as the architect or engineer.

A chapter is devoted to pole type buildings, which are found to have good resistance to wind pressures, to be relatively low cost, adaptable to different types of site and also resistant to damage by earthquake.

Single copies of this booklet can be obtained free of charge from the Director, U.S. Forest Products Laboratory, Madison, Wisconsin 53705.

More fuss over lumber standards

Some dissidents in the long-drawn-out hassle over softwood lumber standards don't seem willing to abide by the new sizes recommended by the American Lumber Standards Committee. Final approval of the A.L.S.C. recommendations awaits circulation of a ballot by the U.S. Department of Commerce to determine, once again, whether or not there is a "consensus" in favor of these sizes. But currently, an unofficial ballot, called "misleading" by both Assistant Secretary of Commerce Hollomon and by the National Forest Products Association, is being circulated offering as "Choice A" a schedule of lumber sizes which was rejected by a majority of the American Lumber Standards Committee on technical grounds, since they did not "conform to the shrinkage relationships developed by the U.S.

Forest Products Laboratory." Mortimer Doyle, executive vice president of the National Forest Products Association, pointed out that private associations sponsoring the deceptive ballot are represented on the A.L.S. Committee, and were instrumental in having the A.L.S. Committee reconstituted last year to include a broader representation of those sympathetic with their view.

Plastic housings for URD

Above-ground housings for making connections between secondary power cables and customer service lines for underground residential distribution are now being made of grass-green colored reinforced plastics. These bell-shaped enclosures are mounted flush to the ground, and eliminate the need for water-tight splices.

School fires analyzed in new N.F.P.A. study

In spite of the lessons of tragic and disastrous school fires, schools are still being designed and built with poorly arranged exit facilities, with combustible interior finish and with other features that spread fires, according to a recent study by the National Fire Protection Association.

The 20-page brochure, "Fire Record of Schools," describes the principal causes of school fires, the most frequent places of origin, how the fires were discovered, and contributing factors to the losses. It is extensively illustrated with photographs and drawings of floor plans. The data is based on analysis of 650 fires in U.S. and Canadian schools.

Copies of the Fire Record of Schools are available, for 75 cents each, from the National Fire Protection Association, 60 Battery March Street, Boston, Massachusetts 02110.

Research into the human environment

Hopes of setting up a British Research Council for the Built Environment, first expressed formally some 2 years ago in a speech by Lord Llewelyn-Davies to the Royal Institute of British Architects (September 1964, page 105), seem to be coming nearer to realization. At a seminar in Cambridge this summer, the Minister of Housing and Local Government, Richard Crossman, outlined proposals to set up a Research Council whose role would be that of a central agency to promote discussion between different disciplines, to select topics for research, and to direct funds to

work being carried out in universities and other comparable organizations. The council, which would operate independently of the Government, would not itself carry out any original research.

Although such an organization could hope for some financial support from the British Government, it would have to look elsewhere for additional resources. The fact that the summer seminar was financed by the Ford Foundation, coupled with the Foundation's apparent interest in the formation of a world grid of organizations concerned with the human environment, would suggest that a new British Research Council might well be partially financed by a Ford Foundation grant.

Weathered steel

The low-alloy, high-tensile steel which left exposed to the weather, rusts to a dark brownish-black, has caught the eye of a good many architects. The source of the alloy's corrosion resistance, according to Dr. J. B. Horton of Bethlehem Steel Corporation, is in the blending of elements to give it good corrosion resistance, good mechanical properties and wearability. After three or four years of exposure, this alloy virtually stops rusting. Dr. Horton, in a paper presented at a recent American Iron and Steel Institute meeting, reported that, oddly enough, at this point researchers have no identifiable clue as to how elements (manganese, silicon, nickel and chromium) exert their influence. The rust is in two layers, an outer layer which is darker appearing containing numerous particles of atmospheric dust, and an inner lighter-appearing layer free of dust. The remarkably dense rust averages about 6.9 mils in depth.

Rensselaer Polytechnic to do architectural research

A Center for Architectural Research has been set up within the School of Architecture at Rensselaer Polytechnic. Alar C. Green, associate professor of architecture, will direct the work of the center with the assistance of Morton C. Gassman, associate professor of architecture, as senior design coordinator.

Rensselaer has already established a tradition for architectural research through a number of public and privately sponsored projects. The aim of the new center is to formalize and encourage development of research activities, which will at the same time provide fresh impetus for the school, particularly in graduate programs.



A commanding site

Perched atop a base which juts out into Sydney harbor are the partially finished major hall (2,800 seats) and the minor hall (1,200 seats). Nearby will be a small experimental theater. The concourse consists of 300-ft wide steps followed by an enormous slab leading to the Opera House.

Sydney Opera House: engineer's view

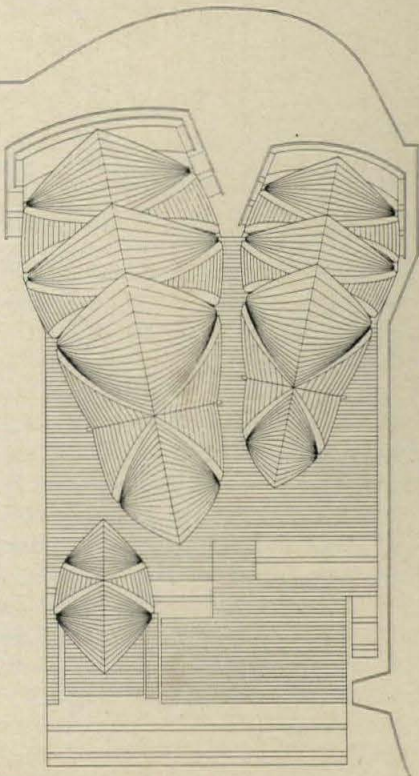
Reactions to Jörn Utzon's Sydney Opera House are never neutral. People are either vehemently for it or violently against it—for any of a wide range of reasons. Not surprisingly, one of the scheme's most vigorous supporters is Ove Arup, structural engineer for the project, who has been involved in what he describes as the "battle of the opera house" for eight years.

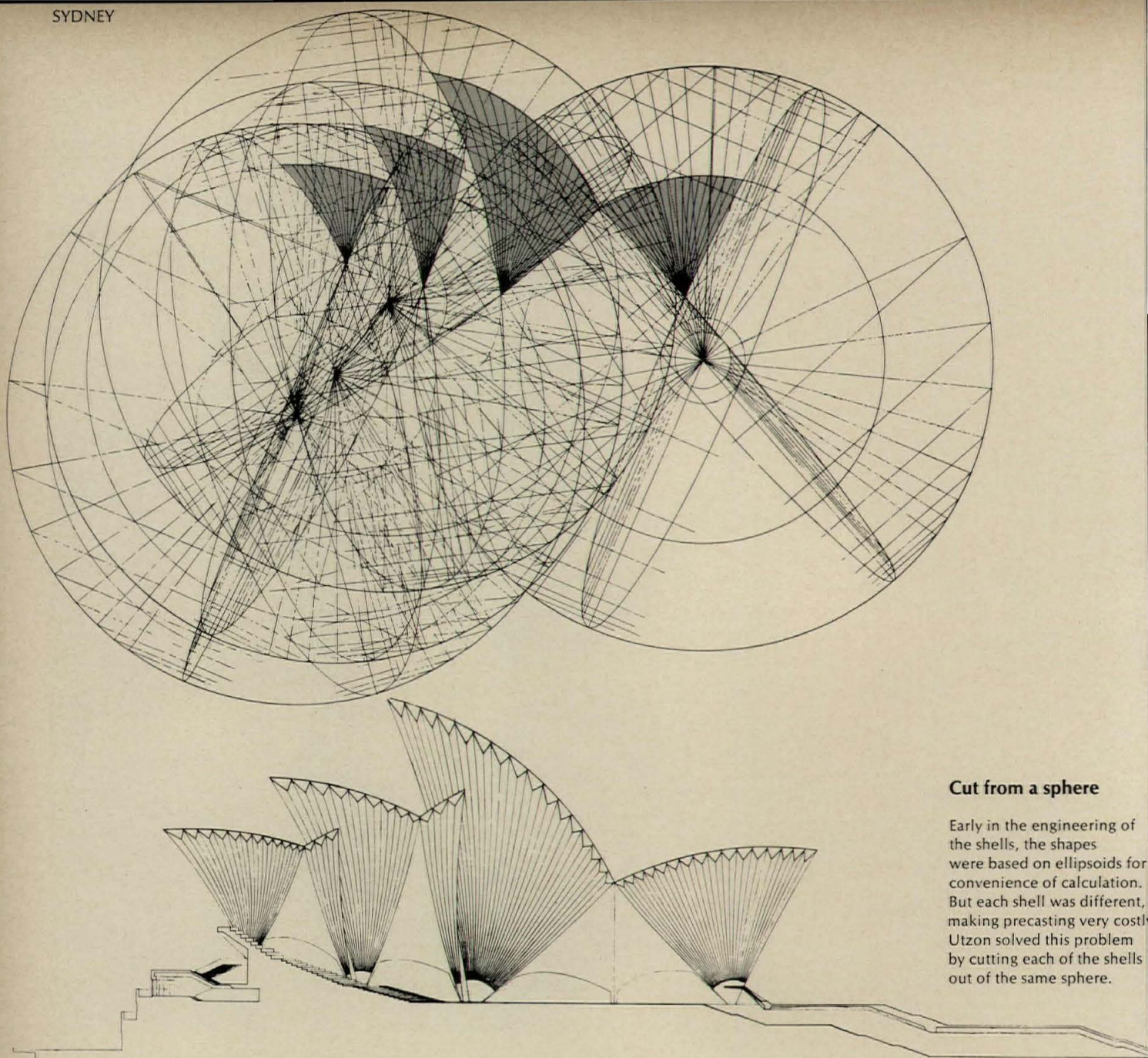
The engineer's description of the Opera House and reactions to the criticisms may well be the most accurate assessment at this stage.

A final judgement of the opera house at Sydney, Arup feels, must be reserved until the building is completed

and has been in use. Only then can the function of the buildings be fully explained, and the success of "the whole venture as an art center, a public resort, a civic symbol, as monumental architecture be assessed, and particular aspects of the structure or various technical solutions be made the subject of special papers inside a known frame of reference."

People still don't really know what the finished building will look like, how it will function, or how much it will ultimately cost. One thing they do know, however, is that it will cost a great deal. The questionable original figure of \$7.5 million has already risen to an official





Cut from a sphere

Early in the engineering of the shells, the shapes were based on ellipsoids for convenience of calculation. But each shell was different, making precasting very costly. Utzon solved this problem by cutting each of the shells out of the same sphere.

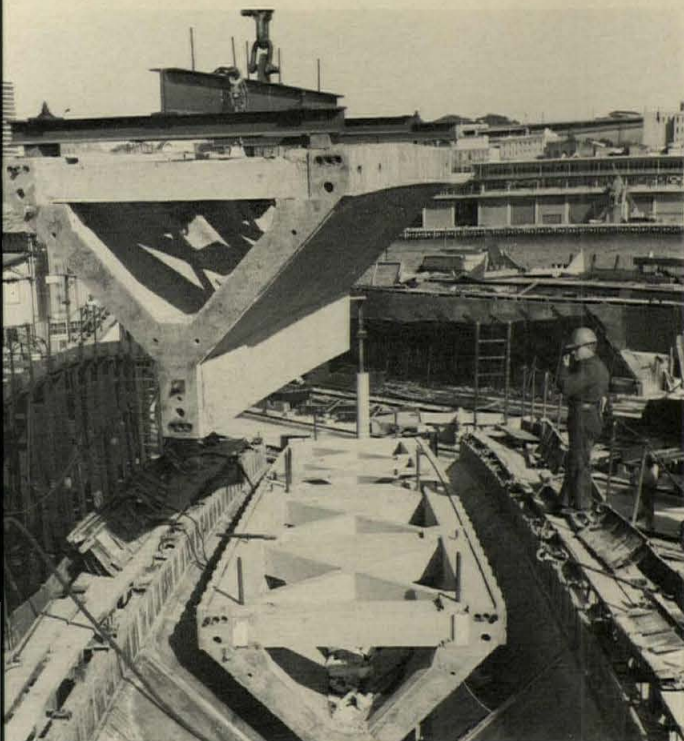
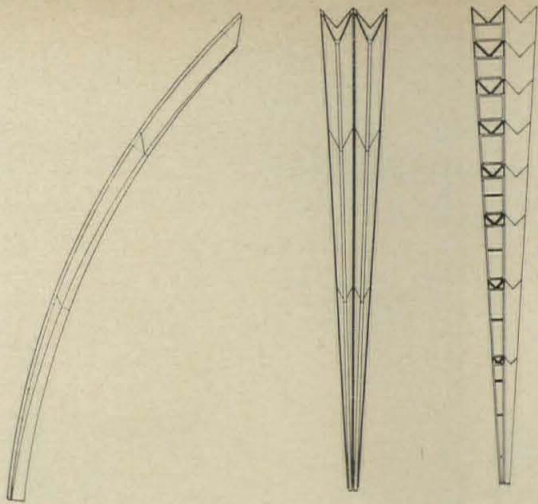
figure of \$39 million and this may not be the end of it. Predictably, many feel that this is much too high a price; as Arup puts it, "such people think it was wrong to waste so much money and so much high-level technical skill on an architectural 'tour de force' when this skill is sorely needed elsewhere. It is the old question of bread versus the circus."

Architectural criticism of the scheme has mainly been in terms of the alleged "dishonesty" of the superstructure, which did not "express the function, but merely camouflaged what went on beneath it." A number of well-known engineers condemned the scheme "because

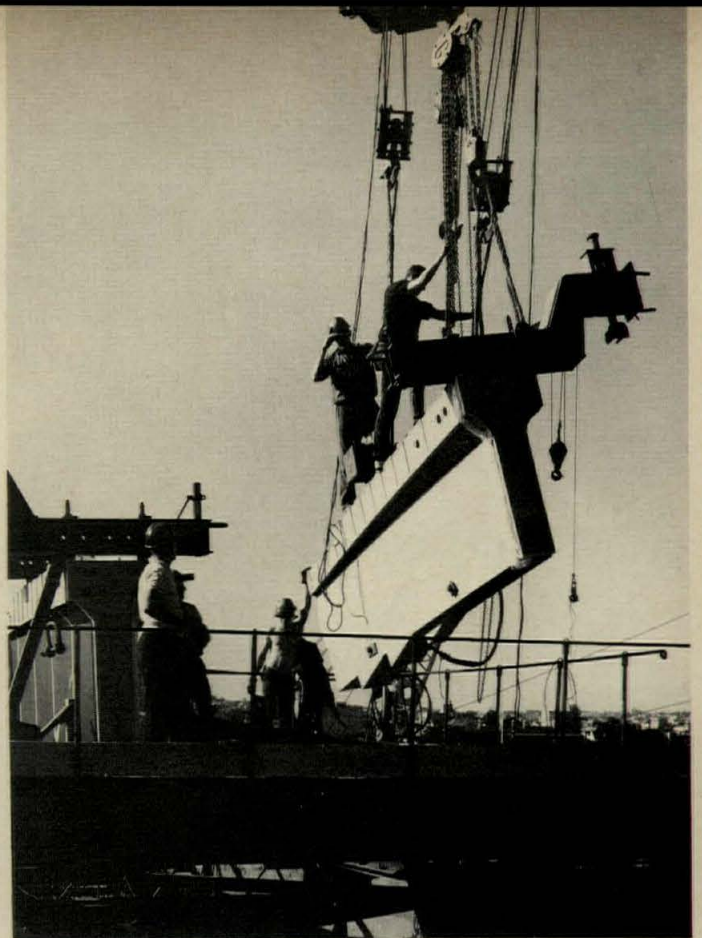
the shape of the so-called shells was not determined by structural considerations, but by architectural caprice, and therefore was not functional in a structural sense." Arup regards this criticism as part of a popular fallacy which mistakenly assumes that the best structure and the best architectural scheme are necessarily one and the same. To Arup, the Sydney Opera House has disproved this assumption once and for all. There were many more logical structural schemes which could have been adopted, but which would have totally destroyed the architectural character.

At the outset of the project, Arup was struck by the fact that "this was a

most unusual and exciting" job. There was, and still is, nothing ordinary or normal about it, and one cannot apply normal standards to it. It may turn out to be a colossal architectural folly or an outstanding masterpiece and at present in Arup's words "the image of the job has an uncanny tendency to hover between these two equally abnormal extremes." The thought, the energy, the exertion, and the tremendous cost that have been expended have been aimed at the creation of a masterpiece, and in Arup's judgement "nothing less than a masterpiece will justify all that this job has called forth from everybody concerned."



Max Dupain photos



The precast arches

The shells are not really shells in behavior, but more like Gothic arches. These arches are made of precast elements either Y-shaped or T-shaped in cross-section. The arches (left and center in sketch) will be sheathed with precast lids (right, in sketch) covered by a specially developed ceramic tile.

Ove Arup and Partners' first contact with the scheme was in 1957, when architect Utzon approached the London-based firm to engineer this building after he had accepted the prize for designing it. Gerhard J. Zunz, Ove Arup's partner in charge of the project, reports that Utzon erroneously thought that his building was "right" from a structural point of view, but this did not deter his firm from working with a man whom Ove Arup himself describes as a genius. "Rarely in the history of architecture," says Ove Arup, "has a job of this size been controlled in such detail by one man." His firm believes that committees never produce art. Thus, the

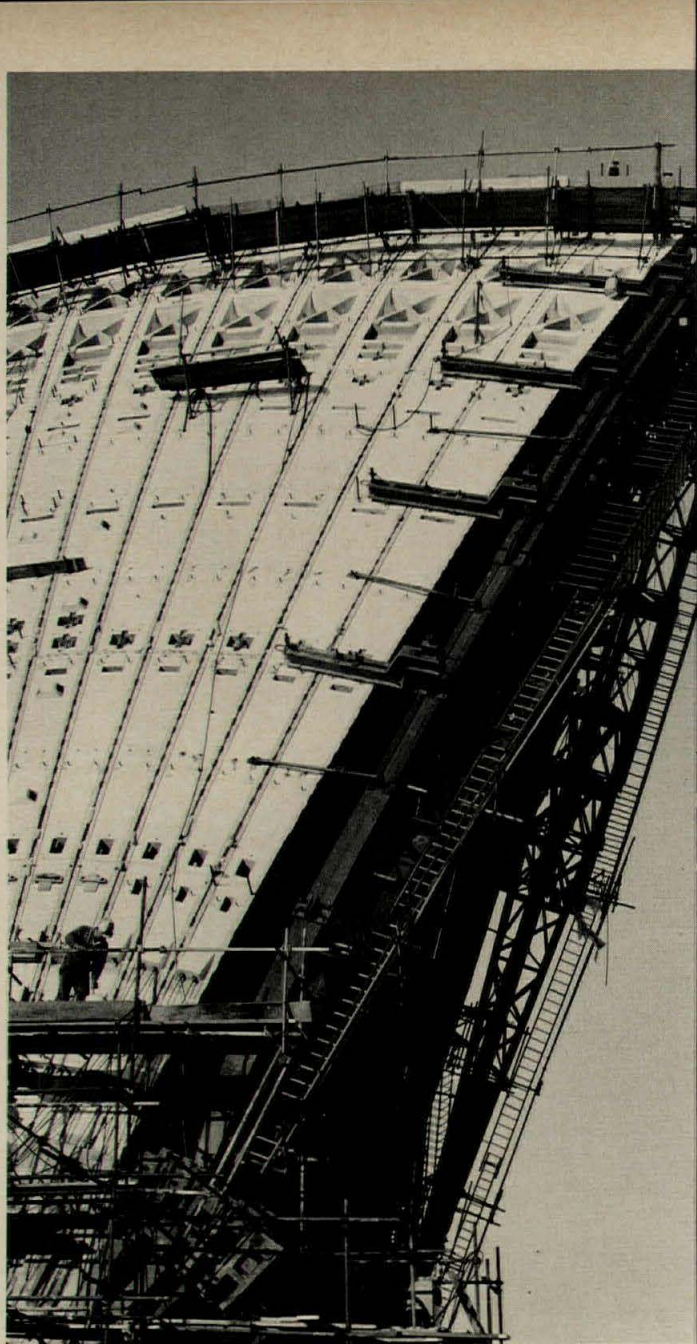
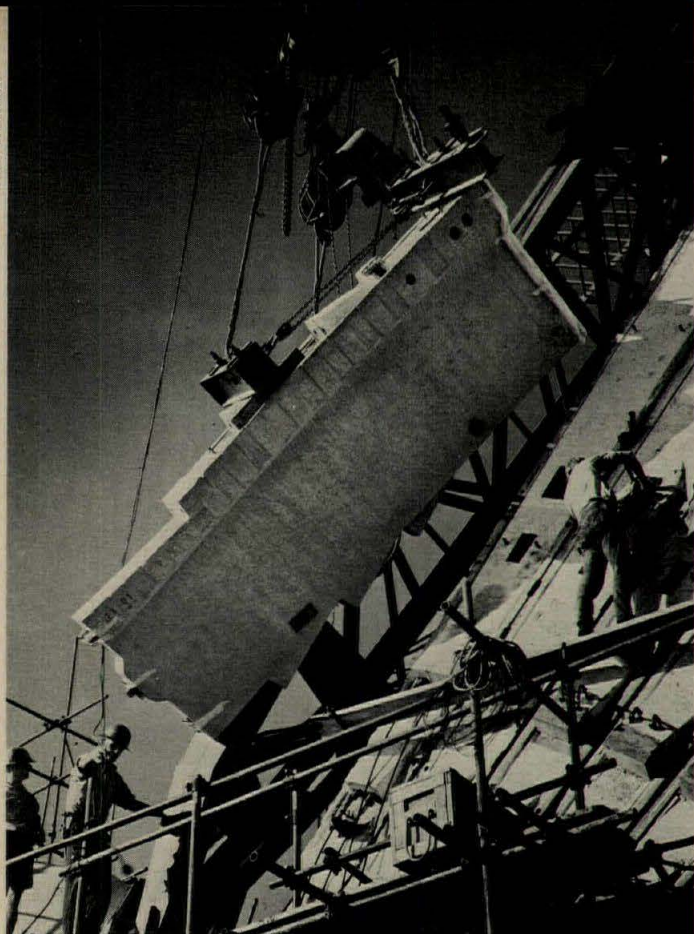
firm's contribution to the scheme has always been the responsibility of one man within the firm rather than a committee. This one man has always been subservient to Utzon.

This does not mean that collaboration between the architect and the engineer has not been good. In fact, the engineer claims that the reverse applies. Says Ove Arup: collaboration between architecture and engineering in a superficial sense is not terribly unusual, but in the "mutually inspiring sense of the word it is very rare. But the latter has happened in this case...because Utzon is a creator, ideas pour forth from him. He is not cramped by any ideological

straitjacket, or bound by any style."

Utzon's original design was only an indication of his intentions, in the form of freehand sketches without geometric definition. His design for the roofs of the halls consisted of four pairs of triangular shells supported on one point of the triangle, and each of the two symmetrical shells in a pair leaning against each other. The shape of the Gothic arch formed between the two supports in each pair did not follow the line of thrust.

Arup's difficulty was that "any alteration to the cross-section which would have eliminated some of the heavy moments induced by self-weight would



Erecting the arches

The precast elements are set in correct position by means of a special erection arch which telescopes to the required lengths of span, and swivels to the proper angle. The precast segments, which vary from 2½ ft to 7 ft in depth are post-tensioned longitudinally and laterally to form a continuous structure

have completely destroyed the architectural character, the crispness and the soaring sail-like quality of the structure." The engineers tried to treat the shells as one continuous structure, but this approach proved to be too difficult.

It took six years to decide the final design of the shells. The geometry of the shells was first established in 1958, being based on a system of parabolas. A model used for wind-tunnel tests was based on this version. As the computer program got under way the shape underwent several alterations, through elliptic paraboloids, and cubic parabolas to ellipsoids, a matter of convenience of calculation which had very

little visual effect on the Opera House.

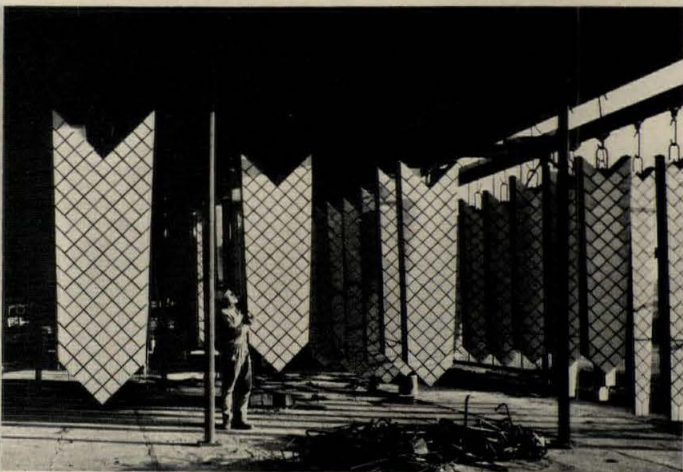
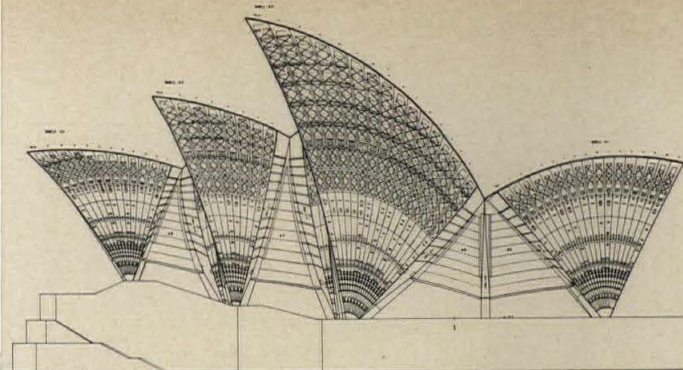
The engineers thought at one time that the shells could be constructed as shells strengthened by ribs. This proved inadequate, and calculations and extensive model tests, which went on for nearly one and a half years at Southampton University, were based on a scheme with double shells, about four feet apart.

Some time during 1961 it was clear that a slight inclination of the shells—which until then had risen vertically from their supports, would be very desirable and also the louver walls, which originally closed in the ends of the shells, assumed a much greater im-

portance for the stability of the structure.

The change of shape meant that all computer programs and model tests were incorrect. At the same time, Utzon wanted to change the way the ends of the shells were enclosed. He also preferred a ribbed effect on the underside of the shells. So after some heart-searchings, the engineers decided to start all over again, abandoning three years work.

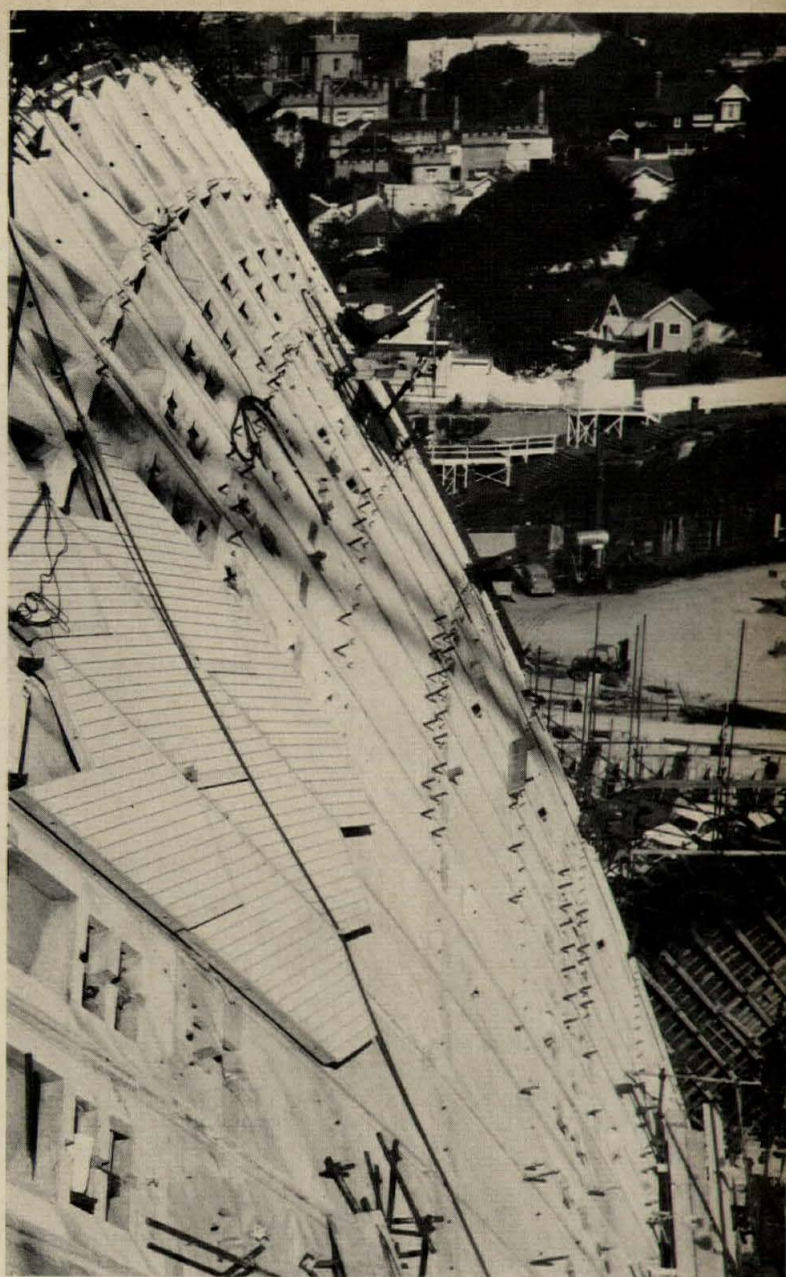
Since 1957, Ove Arup and Partners have devoted 380,000 man-hours to the Sydney Opera House. Up to 60 or 70 people in the firm, of whom half would be professional engineers, have worked on the project at any one time. Around 2,000 computer hours have gone into



A cover of tile

The shells are being clad with white ceramic tiles in a bright glaze, except at the edges of the precast lids, where matte tile is used to give "structural definition" to the arch ribs. The pattern of precast elements in the various shells, X-braced and solid, is shown at the top of this page.

Australian News & Information Bureau



the project. Zunz thus describes the Opera House as a "gargantuan task" in all its aspects.

Basically, the shells behave as arches. The firm describes them as "more or less Gothic arches." No new approaches to structural analysis have evolved from the project, only perhaps new "twists" on standard flexibility and stiffness theory, says Zunz.

On the other hand, the mathematical calculations, though they involved nothing new in terms of mathematical process, presented an enormous problem in terms of their volume. There were single calculations in this process that took three hours of computer time be-

fore the machine could provide an answer.

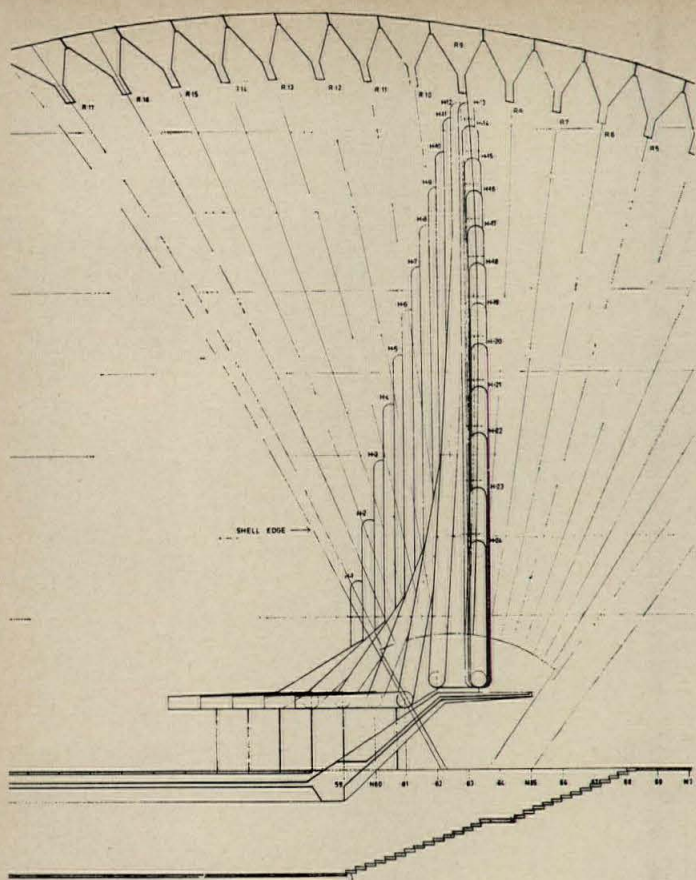
So far as drawings were concerned, the firm found that a computer printout plus undimensioned drawings were the most effective method of communicating their wishes to the contractor to tell him how the formwork should be shaped for the various shells.

The construction process itself is proving similarly exacting. The architect called for an even and continuous lay to the tiles which cap the roof structure. This necessitates great precision in erecting the roof. The contractor, whose chief engineer spent three months in the Ove Arup London office before construction

began, promised to achieve an accuracy of plus or minus half an inch in the positioning of any given point on the roof. During construction surveyors are making continuous checks on this positional accuracy. The readings from their instruments are fed into a computer in Sydney which tells the surveyors within an hour whether the readings are right.

The precast "shells" consist of a fan of similar non-planar ribs or arches, each arch being comprised of a series of precast segments.

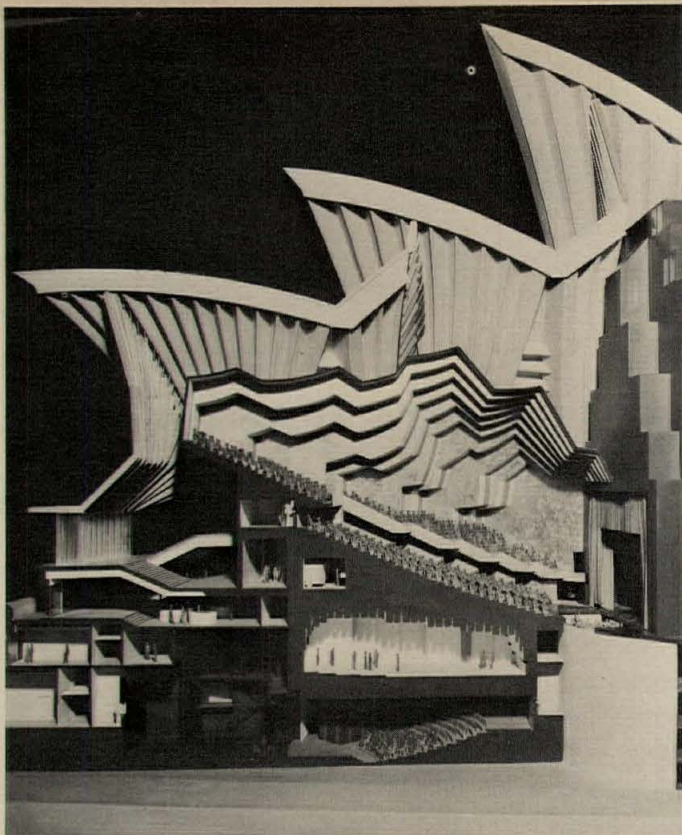
As the precast segments are erected, the exposed ends are coated with an epoxy resin and the next segment placed with the matching surface in contact.



Other shapes

Utzon decided to close in the ends of the shells with twisted glass walls, employing jointed mullions of varying curvature. This will avoid verticality and reflections which in other shell buildings have made the glass seem load bearing. The auditorium has an acoustical reflector hanging from the ribs.

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Max Dupain



Cables, made up of 0.6-in. diameter stress-relieved strand, stress the ribs to a nominal 100 psi when each segment is placed. This temporary stress prevents development of tension in the incomplete rib during erection.

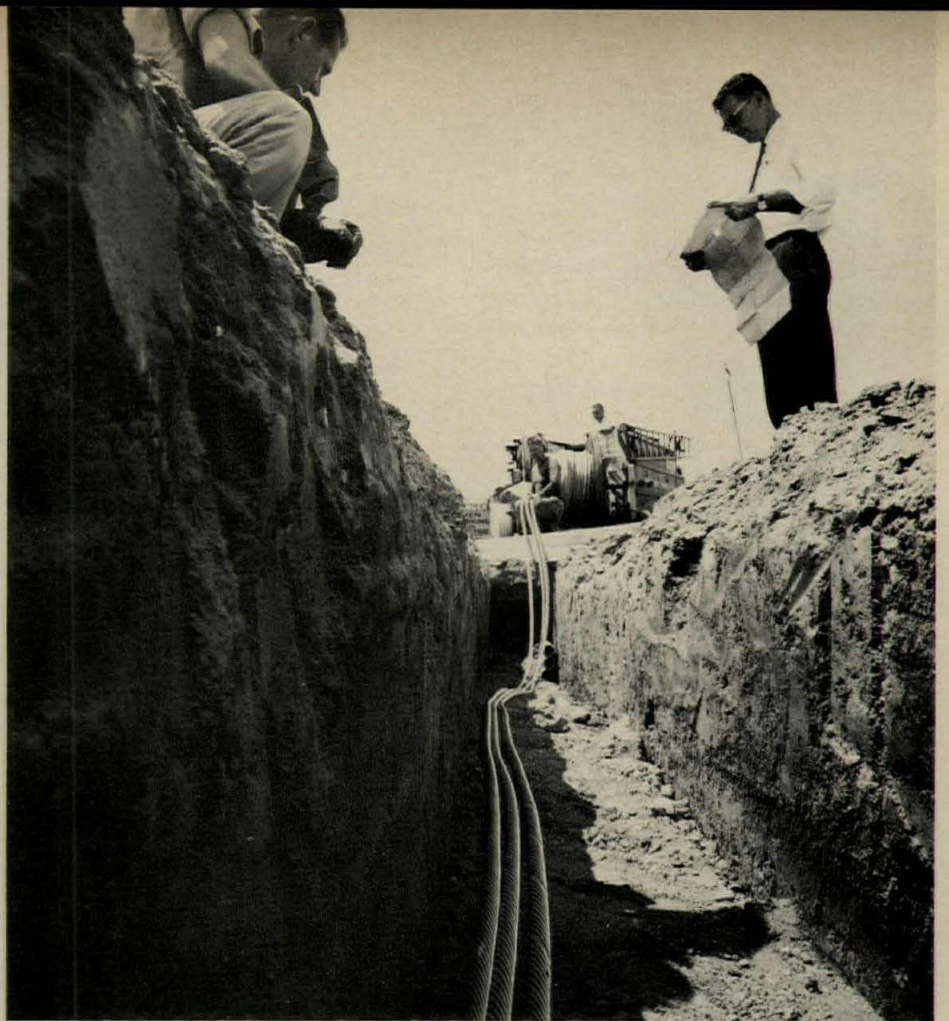
As soon as all segments are in position, the tendons for the final prestress are threaded along the segment ducts and the cables are stressed and grouted. Then the ridge piece is inserted between the two half ribs. More stressing takes place across the ridge to make the two half ribs a continuous structure. Precautions are taken during the construction of the joint to prevent temperature from upsetting its shear properties.

The arches, which are connected laterally by bolts during erection are finally stressed together laterally by means of post-tensioned cables to form a continuous two-way structure.

The engineer describes his work on the Opera House as a paradoxical mixture of "terrible frustration and terrific satisfaction." It is frustrating because a lot of the work on the project has not been directly incorporated into the final design and because any one man can only work on one small part of the project. The satisfaction derives from working on what the engineers feel is one of the world's most exciting buildings.

In pure engineering terms, the

Opera House has been a useful experience for the engineer. Some 200 engineers who have worked on the project at one time or another during its seven-year life have experience in using computers for structural design. A number of these people have moved on from Ove Arup and Partners, and the firm feels that their experience thus spread around has and will benefit the British engineering profession as a whole. In addition, some of the computer programs written for the Opera House are in standard use on other jobs. Zunz says that nearly every major job tackled by his firm benefits from experience accumulated working on the Opera House.



More and more utilities are burying residential power lines as they find ways to cut costs with new trenching methods and new types of cable and transformers—and as they seek greater residential power loads.

UNDERGROUND RESIDENTIAL DISTRIBUTION

Underground residential distribution was much in the headlines last year, largely because of the recommendations made at the White House Conference on Natural Beauty held in May. A panel urged that URD be increasingly adopted throughout the United States and that the public be better informed of its potentialities.

In July Federal Housing Administration Commissioner Brownstein issued a directive requiring burial of utility lines in all future FHA-insured subdivisions "unless such installations are demonstrated to be impractical or economically unfeasible."

This move has already begun to accelerate the growth of URD. In addition, municipal authorities in at least several dozen cities have enacted laws requiring URD in certain new residential areas. Architects have been active in advancing URD, by employing it in such new towns as Foster City, California, and Reston, Virginia, and through educational activities directed to the public.

Some electric utilities have been installing URD for years and have as many as 50,000 installations in their area.

Others, with less experience, are just beginning to get out of the experimental stage. Together with the manufacturers of electrical equipment and wire and cable, the utilities have led the way in developing new techniques and methods that have lowered the cost of URD, and made it increasingly available.

Although most of the URD growth has taken place in the past five years, such distribution has been known since the 1920's. Most of these installations were made in luxury developments where the high premium for improved appearance could be justified. The reason that costs were high was that utilities followed the designs of conventional high-load density systems, which called for completely buried systems, consisting of expensive equipment such as lead-covered cable in concrete duct, subway-type transformers, and manholes. A decade and a half later, when urban and rural power began expanding, special low-load density systems were developed that cost considerably less. Further cost reductions were achieved after World War II when the practicality was seen of the "semi-underground" con-

cept, which retained the cables underground, but brought above grade, either completely or partially, the transformers, connections, and auxiliary equipment.

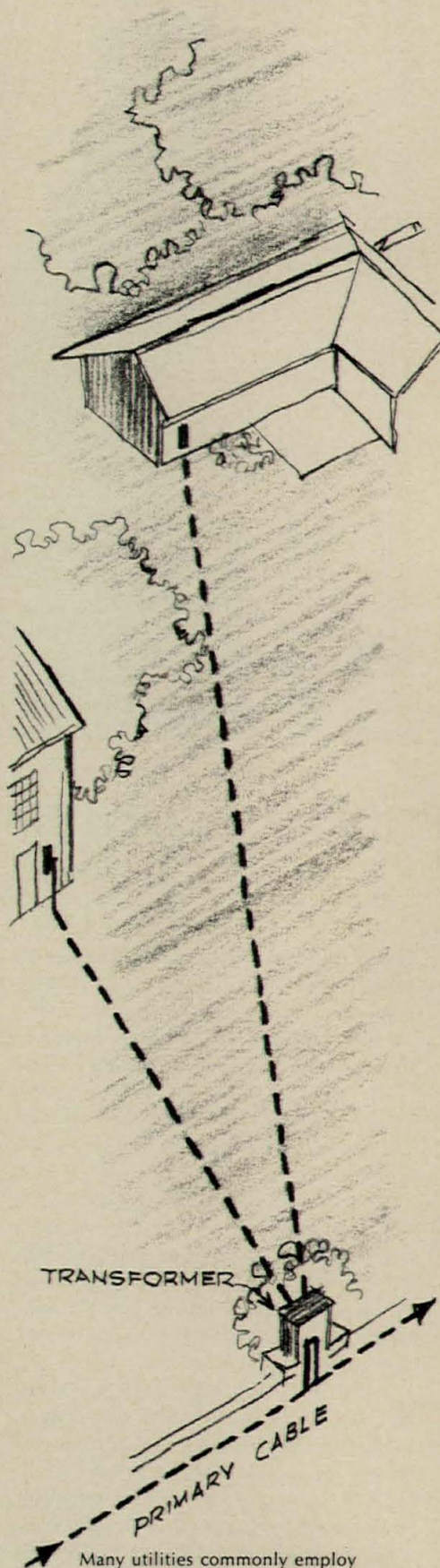
Concealed transformers

With various improvements and modifications, this is essentially the system used most frequently today. Making it possible from a cost point of view is the pad-mount transformer, a conventional transformer modified so it can be mounted on a concrete pad. In most utilities, to reduce outages to a minimum, a normally open loop system is operated with the primary cable looping in and out of each transformer. Out of each transformer also come the secondary cables which run underground to pedestals installed above grade either front or rear lot, the service cables running underground from here to the house.

Some utilities prefer rear lot installation, others front lot. Rear lot systems put the pedestals and sometimes the transformers in the back; but this has the disadvantage that if street lights are to be supplied, extra cables must be extended at intervals. Also the terrain, fencing, and trees sometimes create problems, and the servicemen may have to trample over gardens to get to the equipment. On the other hand, front-lot installation often presents an unsightly appearance. To overcome this, utilities have resorted to several different methods. Some try concealing the transformers, either by landscaping or by location near the building lines. Others make available transformers in different colors, so that they will blend with the surroundings. Others are installing the transformers in the bases of street-lighting fixtures. Still others have designed new ornamental curbside poles, which have slender pole-type transformers mounted unobtrusively near the top, and at the base contain the secondary and service lines which radiate underground to the houses.

The latest trend in solving this esthetic problem is to go completely underground. Some new URD installations feature recently-designed transformers that are buried except for their terminals and covers. Still others are now available that can be buried flush with the ground, their cost no longer prohibitive because their vaults are precast. This type of transformer, installed in a retirement community in Portland, Oregon, was reported undamaged in the heavy floods last year in that area.

The cables for URD are laid in trenches anywhere from 24 to 52 in. in depth and, in many areas, the trenching is shared by telephone lines. A few states like Illinois and Michigan permit random



Many utilities commonly employ exposed transformers mounted on concrete pads as a cost-saving technique. They can be camouflaged by shrubbery and proper color.

lay, but most require a 12-in. separation of well-tamped earth between the telephone and electrical lines, and some require the primary and secondary electrical cables to be separated.

Cable practices vary from one utility to another, half of them using direct-buried cable, the other half, cable enclosed in duct. Both types of cable have their advantages and disadvantages, and such factors as geographic area and the specific application determine which is better. Some systems installed years ago with direct-buried cable gave this method a bad reputation when, because of lack of knowledge then about insulation, they failed to perform satisfactorily. However, other direct-buried cable installed at the time proved this did not need to be the case. Commonwealth Edison of Chicago has had a quarter century of successful experience with direct-buried cable. Similarly, Hawaiian Electric Company has in its URD system buried copper cable which was installed in 1925, which has never needed replacement.

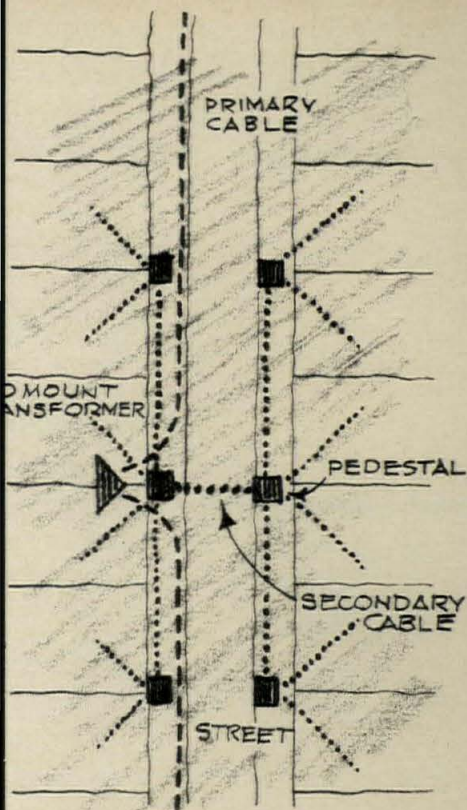
Direct-buried cable has the advantage of costing less initially, affording greater cable capacity (because of the cooling effect of contact with the earth), good dig-in safety (because it is continually grounded), maximum lightning protection, and cheaper repair. Disadvantages are: more frequent maintenance, vulnerability to rodents, and no provision for load growth.

Cable in duct offers greater physical protection, easy replacement, longer life and provision for load growth. On the other hand, it costs more initially, has no continuous ground, and has a lower ampacity. The duct can be of many materials—concrete, steel, fiber, asbestos-cement, or soapstone—but more popular lately is plastic (polyethylene) duct which is also available with the cable pre-assembled in it in the factory.

Many utilities assume complete responsibility for installing URD and servicing it. But some make the developer responsible for certain phases of the installation, such as the ditching and backfilling, while a few require the developer to install the entire system, including the transformers.

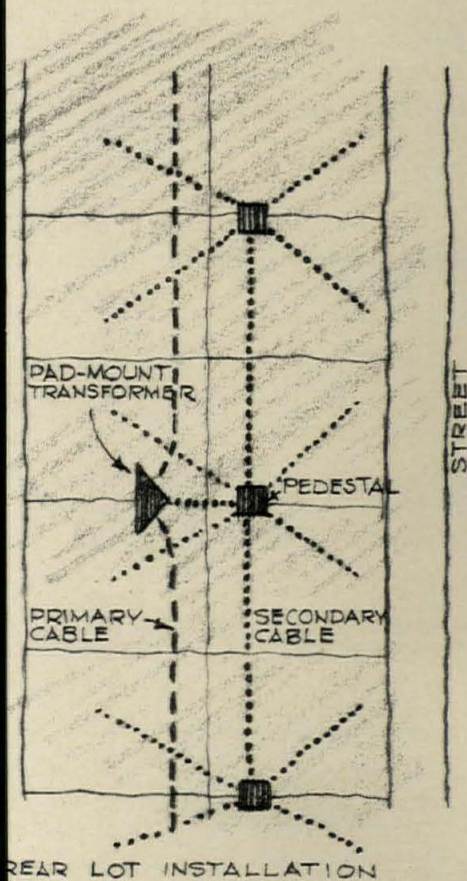
Cost variation

The URD cost varies considerably, although almost always it is higher than the equivalent overhead because of the more expensive equipment involved, the extra protection needed and the necessity to move earth. A decade ago, this ratio was as high as 10:1 but, in recent years, this has been dramatically lowered to as little as 1.5:1. Translated into dollars, the cost of URD in some areas is as high as \$56 per lot, and in others lower than \$10



STREET INSTALLATION

Transformers sometimes are located at the street line—especially when street lights are also supplied (to avoid running extra lines). When at the back, they are more easily hidden.



REAR LOT INSTALLATION

per lot. Many factors are involved, such as load density, load requirements, demand, size of lots, arrangement of lots, terrain, soil, and the number of houses. Also, comparisons are difficult, since some cost estimates include the price of ditching and backfilling, and others do not.

As a result, charges vary considerably. In almost all cases, they are based on the cost differential between underground and overhead, but they can run from \$500 to less than \$100 per lot.

Cost reducing factors

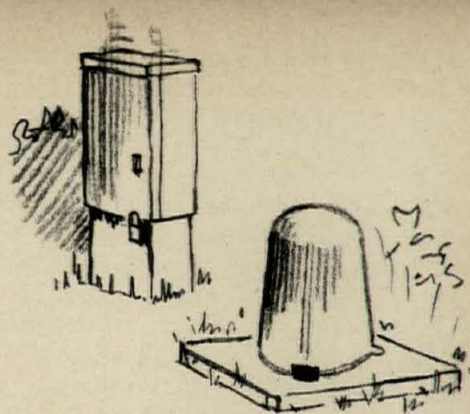
Gradual lowering of URD costs in the past decade has been achieved by the development of better equipment and methods. Some utilities, for example, have coordinated their design systems on a unit basis, thus simplifying estimation with the additional advantage of cost reduction.

Hawaiian Electric Company has gone so far as to use a computer to help select transformer and cable sizes from 53,952 combinations.

More efficient equipment has been developed for trenching and backfilling. This has reduced cost, as has the adoption by many utilities of lower depth requirements for trenches. Whereas trenches were once dug to 4 ft. they are now usually 24 in. for primary cable, 18 in. for secondaries. Similarly, sharing the trench with other utilities, like telephone or gas, has reduced the trenching cost 30 per cent in some areas.

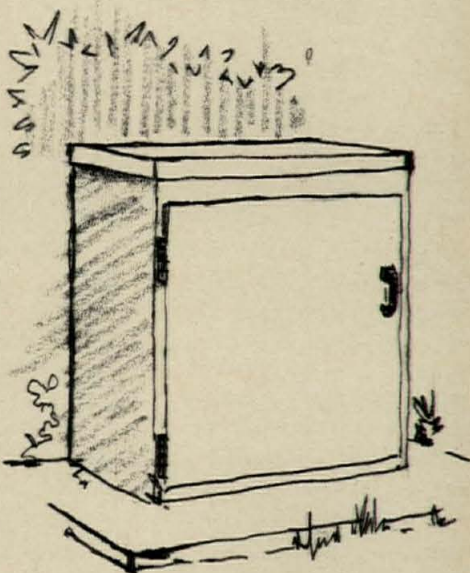
Technical innovations also have helped to lower costs. New type cable with insulation of optimum design for URD affords the cost reduction. So does the preassembled cable in duct. One California utility which has reduced the cost of its URD installation from \$800 to \$137 per lot in 18 years attributes 50 per cent of this cost reduction to its use of preassembled cable in duct. Also aiding cost reduction are new termination procedures. By terminating primary conductors with epoxy-filled plastic-shell potheads instead of porcelain terminals, a cost savings of 70 per cent is possible. Similarly, the tapping of underground secondaries has been simplified by using short leads and insulated terminations.

Other developments have resulted in lower URD costs. For example, since a transformer can service from four to 12 houses, a plan where the optimum number of houses can be served by each transformer can result in lower unit URD costs. In large subdivisions, this is achieved easily, but it suggests that when architects are involved in individual houses, they join forces with other architects in the surrounding area in a cooperative effort to lower the URD cost even more.



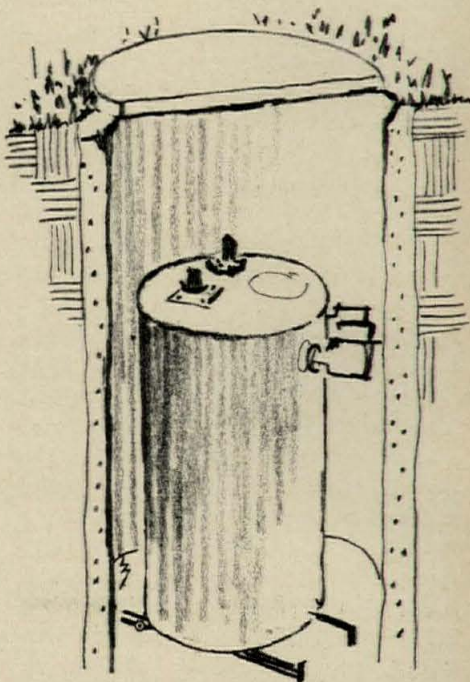
SERVICE PEDESTALS

Secondary cables from transformers are run to service pedestals, from which customer service cables get their source of power.



PAD-MOUNTED TRANSFORMER

While the pad-mounted transformer has become popular with the utilities, the transformer also can be placed below grade, as shown here.



BELOW GRADE TRANSFORMER

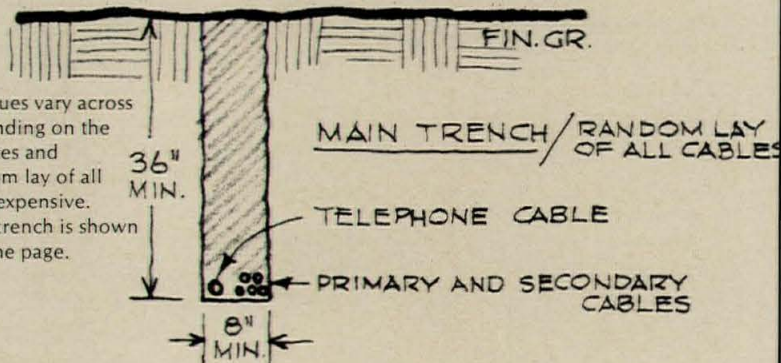
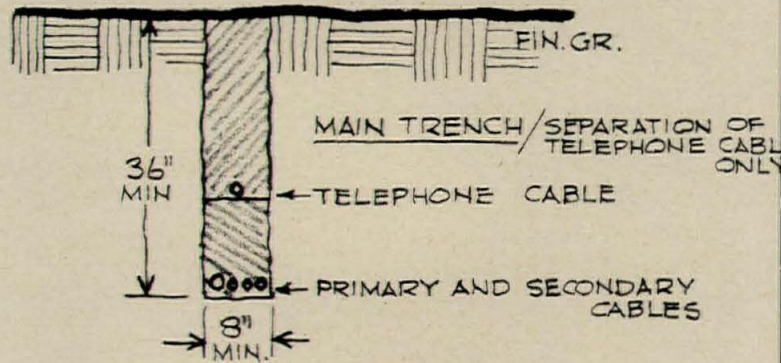
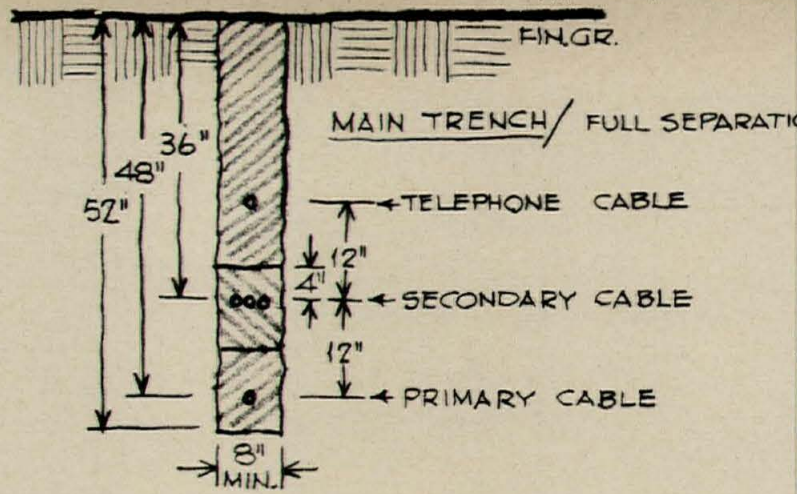
Future trends

What does the future hold for URD? Various trends indicate continued growth as the cost is lowered and public interest accelerates. Other trends are also evident. For example, it is expected that in future URD installations, the utilities will accept ownership and responsibility for operating and maintaining service cables as well as the primary and secondary cables. It is also expected that electrical URD circuits will be installed in raceways provided in curbs or under sidewalks. Also it is thought that in many areas the service pedestals will disappear, the street lighting fixtures serving as the location for power connections. Undoubtedly, the pad-mounted transformers will disappear too, replaced ultimately by transformers which are located completely below grade.

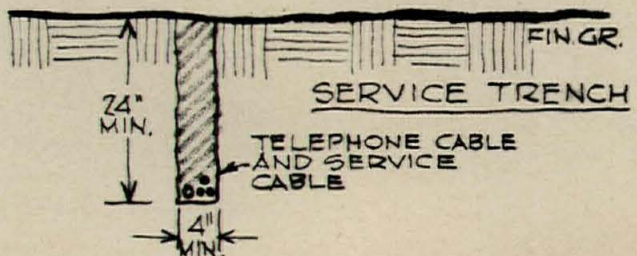
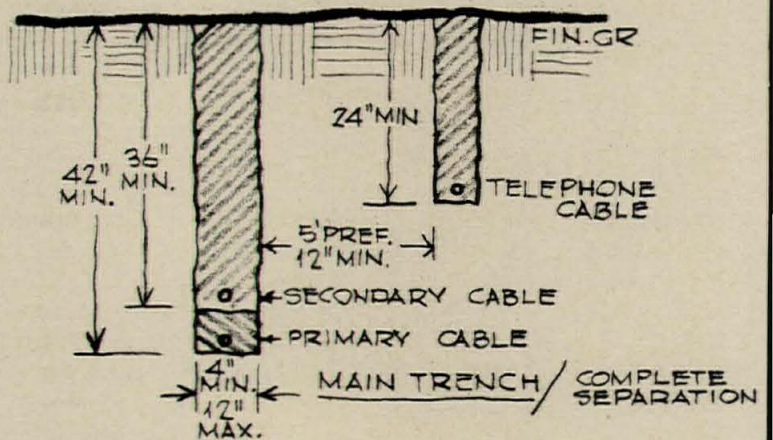
Similarly, an increasing number of services are expected to share the trench with URD. Gas, water, sewerage, oil, communication lines — these are a few that have been suggested. One plastic conduit already on the market provides for electricity as well as CATV cable and cables for telephone, remote metering, and programmed music. Trenching itself will become improved with the new type shock-wave trenchers that not only dig the soil, but loosen it with sonic waves. The insulating thicknesses of cable are expected to be reduced in size. As for the system design, this is expected to remain single phase operated as a normal open loop in most installations, but in large developments, it is anticipated that three-phase mains will be adopted.

In the years ahead, a definite trend toward standardization is also expected. Several standards in equipment have been proposed, but as one electrical manufacturer pointed out recently, for every 100 customers, there are still 85 different designs. Some feel standardization is premature now, pointing out that the rapid changes in techniques, methods, and materials make it a short-sighted move at the present time. But all agree that the lack of standardization is the biggest single drawback to lowering costs further.

Even the most conservative of those involved in URD predict that by 1970, more than 70 per cent of all new residential construction will feature underground residential distribution. Some think by then, or at least by 1975, there will be total URD. For the latest information on URD, architects should consult their local utilities. Also, an information service furnishing statistics, case histories and technical information has been established by the Copper Development Association.



Trenching techniques vary across the country, depending on the utilities' preferences and experience. Random lay of all cables is the least expensive. Customer service trench is shown at the bottom of the page.





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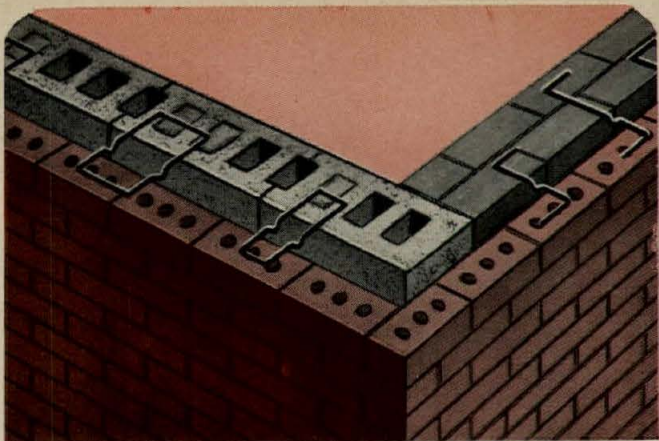
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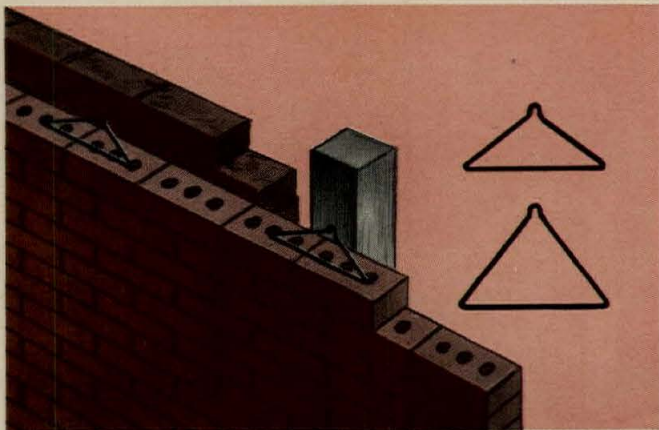
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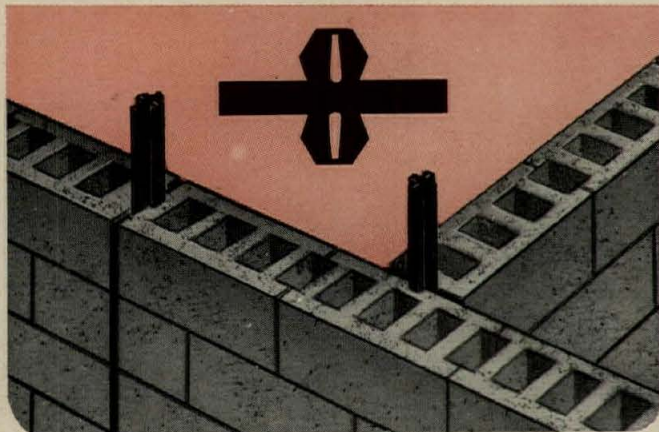
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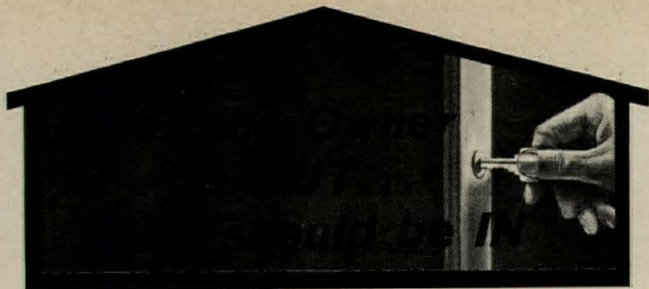
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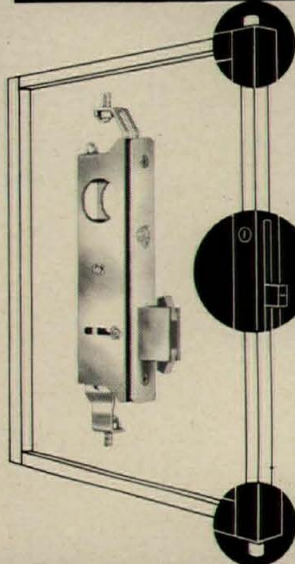


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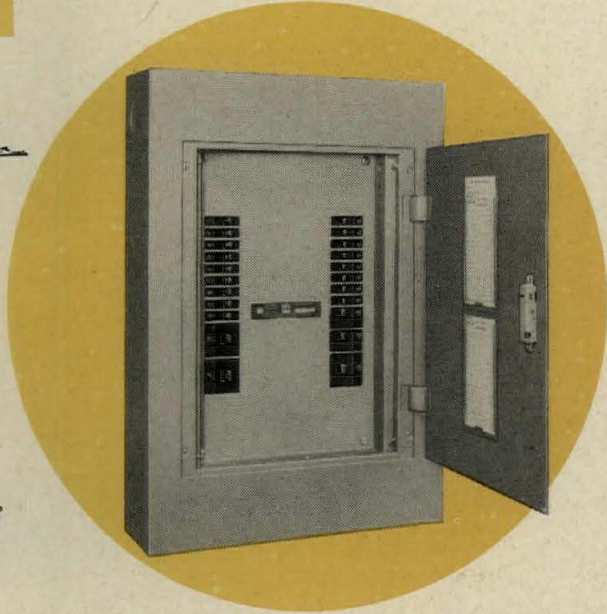
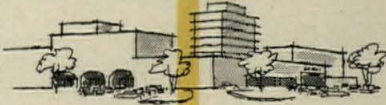


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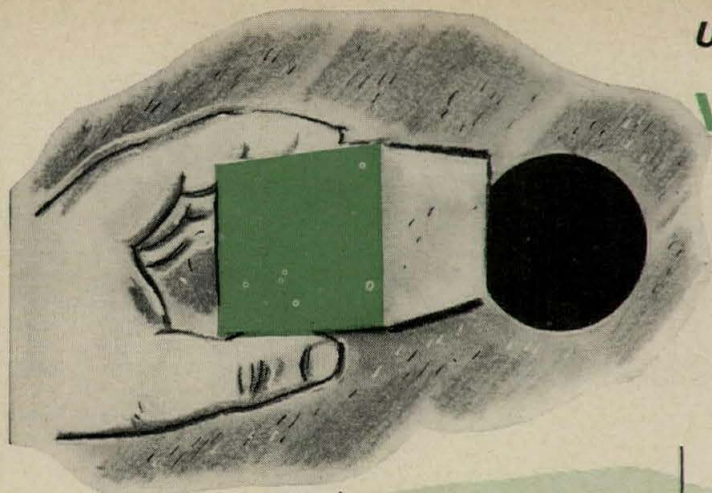
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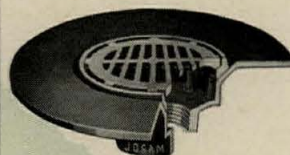
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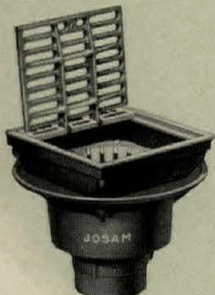
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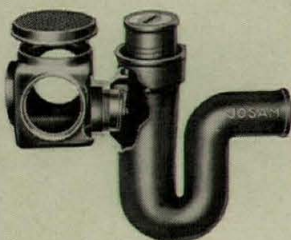
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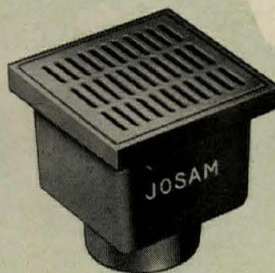
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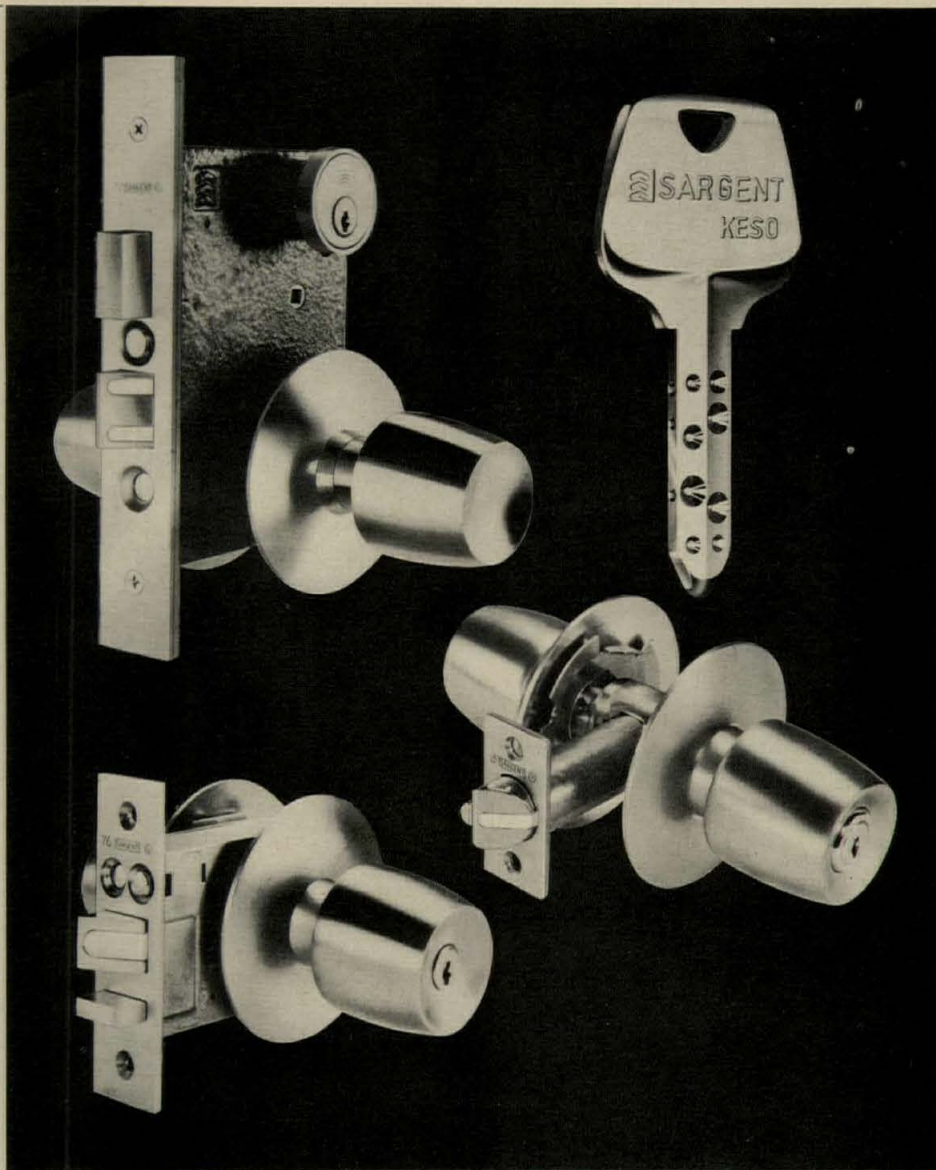
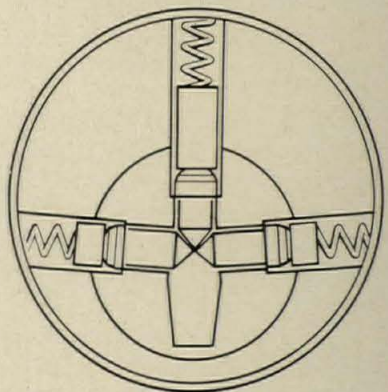
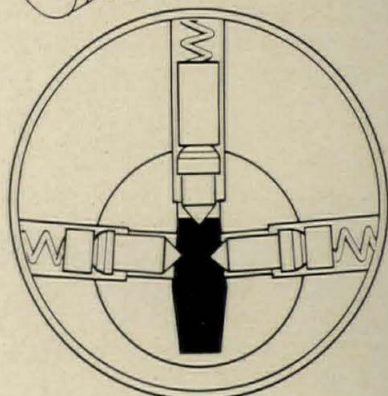
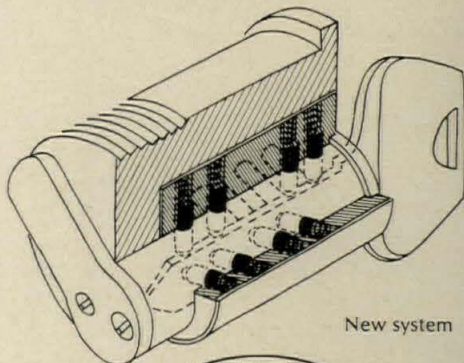
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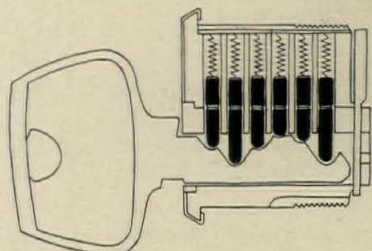
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New lock cylinder has three rows of pins randomly spaced instead of the conventional one row. The key is not serrated, but has milled depressions which set the pins at the "shear line" so that the tumbler can be turned to release the bolt.



Conventional system (not master-keyed)

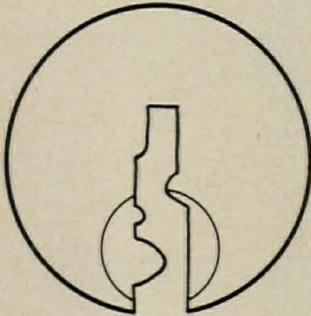
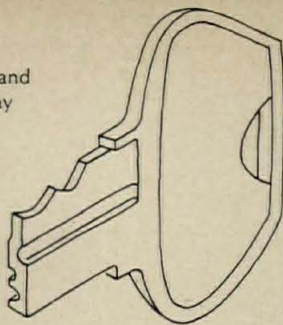
Keying system improves security

A new principle in lock cylinders has been introduced by Sargent & Company which offers far greater security than conventional locks, defying even expert "lockpickers." Instead of one row of pins which must be aligned by a key before it can turn the tumbler, the new locks have three rows. Moreover, the pins are not evenly spaced in a row, but have random positions which have been

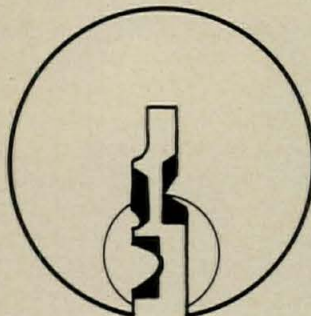
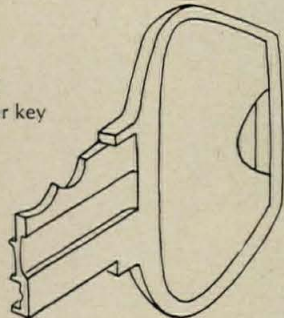
"scrambled" by computer. The new keys have precision milled depressions on the two edges and the two flat sides. They are made only by highly specialized machines in the Sargent factory. The differences between the new lock cylinder and a conventional one can best be appreciated by first reviewing the century-old conventional device.

A non-master-keyed cylinder has

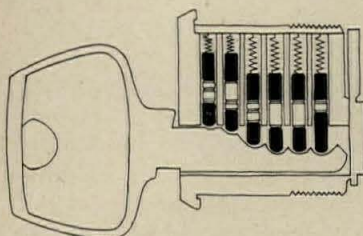
Day key and its keyway



Profile of the master key



When the conventional lock is master-keyed, the pins are sub-divided into splits. The greater the level of master-keying, the greater the loss of security, since the row of pins will have several shear lines at which they can be turned. The day key keyway is notched to receive one key shape but not another. The master key has fewer ridges so it can fit a number of day key openings.



one row of pins which are equally spaced and are in an in-line position. All cylinders utilize springs, drivers and pins. Usually there are five or six pins in a cylinder.

A cylinder which has been master-keyed looks much the same except for that fact that the pins have been sub-divided into a number of "splits" to allow for the use of the master key as well as the day key.

The insertion of a key raises the key pins so that the drivers or the splits align with the "shear line" thus allowing the barrel to rotate within the cylinder. The greater the level of master-keying, the greater the number of splits required and the greater the chance a potential lock-picker has to find the shear line.

In theory, there are one million day key changes possible in a 6-pin non-master-keyed pin tumbler system. But in practice, this figure is reduced to approximately 500,000 usable and safe day key changes. When master-keying or grand master-keying is required, this figure is drastically reduced to approximately 2,000 usable and safe day key changes.

To elevate the system to a great grand master-key level, the available day key changes drop to about 500 within one keyway configuration. On a job of any size, such as most buildings where a great grand master system is required, 500 day key changes are not enough. For this reason, multi-keyway systems must be employed. When using multi-keyways, there is no guarantee that one key change used under one master-key will not be the same change as used under another master-key within the same system.

Another limitation is that the master-key system for individual jobs or projects have probably been used before, and will probably be used again.

Within a keying system, any number of different keyway configurations may be used. Each will differ slightly from the other, preventing a day key from one keyway entering that of another. A master key will enter two or more of these keyways.

In a typical day key change keyway, the cylinder barrel has been "warded" or notched to receive one key configuration but not another. To allow a master-key to enter the keyway, one or more of the projecting ridges of the master-key have been cut away.

One of the greatest reasons for the loss of security is the ease with which ordinary keys can be duplicated. Anyone in possession of a day key or a master key can have it duplicated in a matter of minutes at a very small cost.

Compounding the problem is the

fact that many of the key cutting services, in order to reduce their key blank inventory, will stock only master-key blanks. When any day key is duplicated on a master-key blank, the duplicate bears the master-key configuration and will pass various keyways, resulting in a breakdown of the system's security.

The new system utilizes a completely new concept in the pin tumbler cylinder affording:

1. Full key control by the building owner
2. Cylinder with high pick resistance
3. Several expanded levels of master-keying
4. Many more safe day key changes
5. And a system through which each job is proprietary.

Each cylinder has 12 pins placed in three different rows. The positions of the pin holes in each row vary as well as the length of the key pins.

The individual cylinders and keys in a system vary from one another by the position of the pin holes and key pin lengths.

Critical manufacturing tolerances are held to one-sixth of those of conventional cylinders. The tolerance held is 0.0008 in.

In the Maximum Security System, master-keying is accomplished without the introduction of key pin splits within the cylinder, regardless of the level of master-keying.

Keys cannot be duplicated in the field on key cutting machines now in use. All duplicate keys are made on special equipment at the Sargent factory under top security conditions. In this way, the building owner retains absolute control over the duplication of keys and is not concerned with the corner-store key cutter. Another unique feature of the system is that the key is symmetrical and thus reversible.

In the new Maximum Security System cylinder, regardless of the master-keying complexity, there is a total of 24,500 safe usable and unduplicated day key changes available within any one system. The number of systems that may be employed is virtually unlimited.

There also are seven complete levels of master-keying.

Special procedures are maintained throughout the entire order handling procedure in the field and at the factory to maintain security. Three special forms are used. The first is a "signature authorization" card which is permanently kept in a locked file at the plant. A second form is filled out by the owner when he wishes to authorize the manufacture of additional items to extend his security system. A third form is used by the owner to order duplicate keys for his system.

for more information circle selected item numbers on reader service inquiry card, pages 247-248

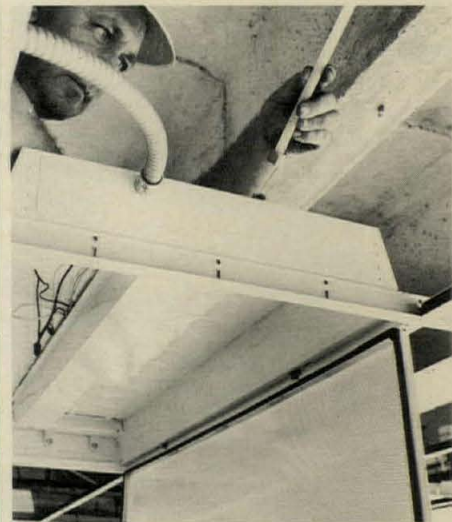
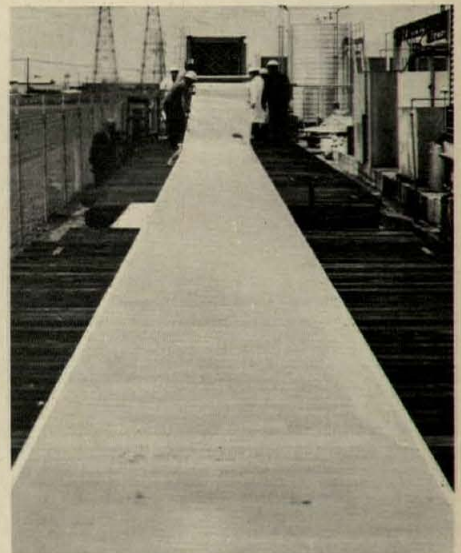
Continuous casting process for acrylic plastic sheet

A significant development in the production of acrylic sheet is the introduction by Swedlow, Inc. of a continuous casting process which is expected to reduce substantially the cost of acrylic sheet within a few years. The machinery, which has been installed at the company's Garden Grove plant in California, is designed to produce a usable sheet up to 96-in. wide, but initially a width of only 48 in. will be cast. A wide range of patterns, colors, and configurations can be produced by the new process.

While the initial chemical preparation of the liquid acrylic monomer does not differ very much from the method

used in making conventional cell cast acrylic sheet, the new process introduces the liquid monomer to its catalyst at a predetermined rate within the casting machine. Chemical reaction of the monomer to the catalyst is then closely controlled to produce the cured sheet, which subsequently passes through cooling equipment to sawing and stacking machinery or is made into rolls of whatever length is required. The new product, which is called *Swedlow 300*, is said to be comparable with cell-cast sheet, except for a slightly reduced surface polish. ■ Swedlow, Inc., South Orange, Calif.

Circle 300 on inquiry card



Environmental control through non-refrigerated water

The *Lite-Therm* system makes use of non-refrigerated water to intercept radiant heat associated with sun and artificial light before it enters occupied building space. The heat thus absorbed can be rejected during summer months when cooling is required, and can be utilized to heat the building during winter months.

The non-refrigerated water circulates continuously through lighting luminaires and vertical window louvers, capturing up to 70% of the lighting input energy and 88% of the solar heat. An evaporative cooler outside the build-

ing rejects the heat during summer, thus effecting considerable saving in the amount of refrigeration and air distribution required to cope with these heat loads. During winter, when substantial heat losses normally occur at the perimeter of a building, the heat from the lighting fixtures is transferred through the non-refrigerated water to the louvers at the perimeter glass area. In this way, heat from the lighting fixtures is utilized to heat the building. ■ Environmental Systems Corporation, Lithonia Lighting Inc., Conyers, Ga.

Circle 301 on inquiry card

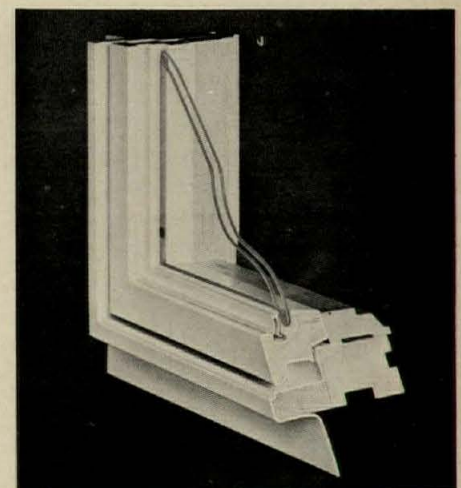
Vinyl coated wood windows need no maintenance

Andersen's new line of *Perma-Shield* wood windows and gliding doors will be available early this year, and are said to be completely maintenance free as well as having high insulating and thermal-stability characteristics. *Perma-Shield* is produced by applying rigid vinyl over the surfaces of wood window sash and the exterior surfaces of the frames. On gliding doors, both the exterior and interior surfaces of the door panels and frames are covered. The company claims the new units will not need painting or other protective

treatment during the life of a building. On the window sash, the vinyl is extruded directly over a preservative treated wood core. Mitered corners are completely sealed by a special welding process. The exterior surfaces of the window frames are protected by bonding pre-formed rigid vinyl to the wood with a specially prepared adhesive. Both windows and doors will incorporate specially designed hardware and insulating glass as a standard part of the line. ■ Andersen Corporation, Bayport, Minn.

Circle 302 on inquiry card

more products on page 196



OFFICE LITERATURE

for more information circle selected item numbers on reader service inquiry card, pages 247-248

HEAVY DUTY LOCKS / An 8-page folder contains specifications, descriptions, photos, numbering and ordering data for the company's line of heavy duty lock and latch sets. ■ Arrow Lock Corporation, New York City.

Circle 400 on inquiry card

THE OPEN STAGE / Bulletin No. 109 gives detailed information on every aspect of the use and design of open stages. A chapter written especially for architects and engineers includes typical plans and sections with production sketches and brief project histories, information on acoustical design of auditoriums, architectural and engineering layout factors and lighting equipment schedules for different applications of the open stage. The bulletin is available, price \$1 from ■ Hub Electric Company, Inc., Chicago, Ill.*

Circle 401 on inquiry card

CURVILINEAR GRID FRAMES / The first of a series of reports on experiments with this type of building construction, conducted jointly by the company and Professor Charles R. Hutton, head of the Department of Architectural and Civil Engineering, Calumet Campus, Purdue University, has recently been published. The curvilinear grid frame structures designed by Professor Hutton using INX-70 high strength steel and galvanized roof deck are grouped in three classes: hyperbolic paraboloid, dome, and monkey saddle. All structures were first assembled on the ground in a flat, grid pattern, welded together and then hoisted in place. As they are lifted, corners of the roof section begin to soar giving a wing-like effect. The chief advantage of this type of structure is that it covers a given area of space with about half the materials used in span and joist construction. ■ Inland Steel Company, Chicago, Ill.

Circle 402 on inquiry card

ELEVATED FLOORING / A guide to the selection of surfacing materials for pedestal floors contains descriptions and colored reproductions of the various types of flooring available. ■ Armstrong Cork Company, Lancaster, Pa.*

Circle 403 on inquiry card

EXPLOSION-PROOF HOUSINGS / A revised 36-page catalog, Bulletin 165, contains conveniently indexed sections covering over 240 sizes of the company's nine major lines of UL-listed explosion- and weather-proof housings and boxes, control stations, operators and fittings. A special feature of the catalog is a section of large explosion-proof housings, up to 18 in. by 36 in. by 8 in. in size, made of Adalloy non-magnetic rust-proof cast aluminum. An expanded section on explosion-proof push buttons, pilot lights and selector switches incorporates a combination pilot light/push button and two new maintained contact operators. ■ Adalee Manufacturing Company, Cleveland, Ohio.

Circle 404 on inquiry card

VERTICAL FILES / Among the vertical shelf files featured in a new color folder, is the Roll-out model which at the touch of a finger rolls out an entire shelf for easy accessibility and permits filing from either front or side. ■ Royal-metal Corporation, New York City.*

Circle 405 on inquiry card

CONTROL OF PARKING / Use of automated parking control equipment for commercial, institutional and industrial applications is illustrated in a new brochure. Included in the information given are: standard driveway layouts, descriptions of electric parking gates and the various ways in which they can be actuated, notes on the use of treadles, vehicle presence detectors and lot capacity counters, as well as suggestions on lot planning. ■ Western Industries, Inc., Parking Controls Division, Chicago, Ill.*

Circle 406 on inquiry card

ENVIRONMENTAL CONTROL / Bulletin AC-130 contains 16 pages of design and application information on the company's central station air handling cabinets for heating, ventilating and air conditioning systems. A new unit selection chart, based on the company's "total system concept" can be used to assure correct matching of components with system requirements. ■ Buffalo Forge Company, Air Handling Division, Buffalo, N. Y.

Circle 407 on inquiry card

STAINLESS STEEL CURTAIN WALL / "Suggested Guide Specifications for Stainless Steel Curtain Walls or Stainless Steel Components in Curtain Walls" has been published by the International Nickel Company in association with the Committee of Stainless Steel Producers. The guide may be used to specify complete commercial or custom curtain walls as well as stainless steel shapes, windows or other components. A section on the covers of the booklet contains notes on relevant background information. ■ Committee of Stainless Steel Producers or International Nickel Company, Inc., New York City.

Circle 408 on inquiry card

FIRE RESISTANCE OF DUCTWORK / Fire tests on four commercially available heating and air conditioning ductwork materials are documented in a color motion picture entitled "Modern Ducts and Fire Safety." The tests were conducted in a leading research laboratory and measured the strength and performance of ductwork materials in "problem environments" as well as resistance to fires. Some of the tests are said to show greater fire resistance on the part of galvanized steel ducts than aluminum, asbestos-aluminum or glass-fiber ducts. A booklet summarizing the tests has also been produced. ■ Committee of Galvanized Sheet Producers, American Iron and Steel Institute, New York City.

Circle 409 on inquiry card

STEEL JOISTS / The 1966 edition of "Specifications and Load Tables for High Strength Open Web Steel Joists" has just been published. The information given makes possible quick and accurate specification of joists to carry loads on spans up to 96 ft. Joists covered include: J-series joists from 36,000 psi minimum yield strength steel; LA-series longspan joists compatible with the J-series; H-series high-strength joists made from 50,000 psi minimum yield strength steel; LH-series compatible longspan joists. ■ Steel Joist Institute, Washington, D.C.

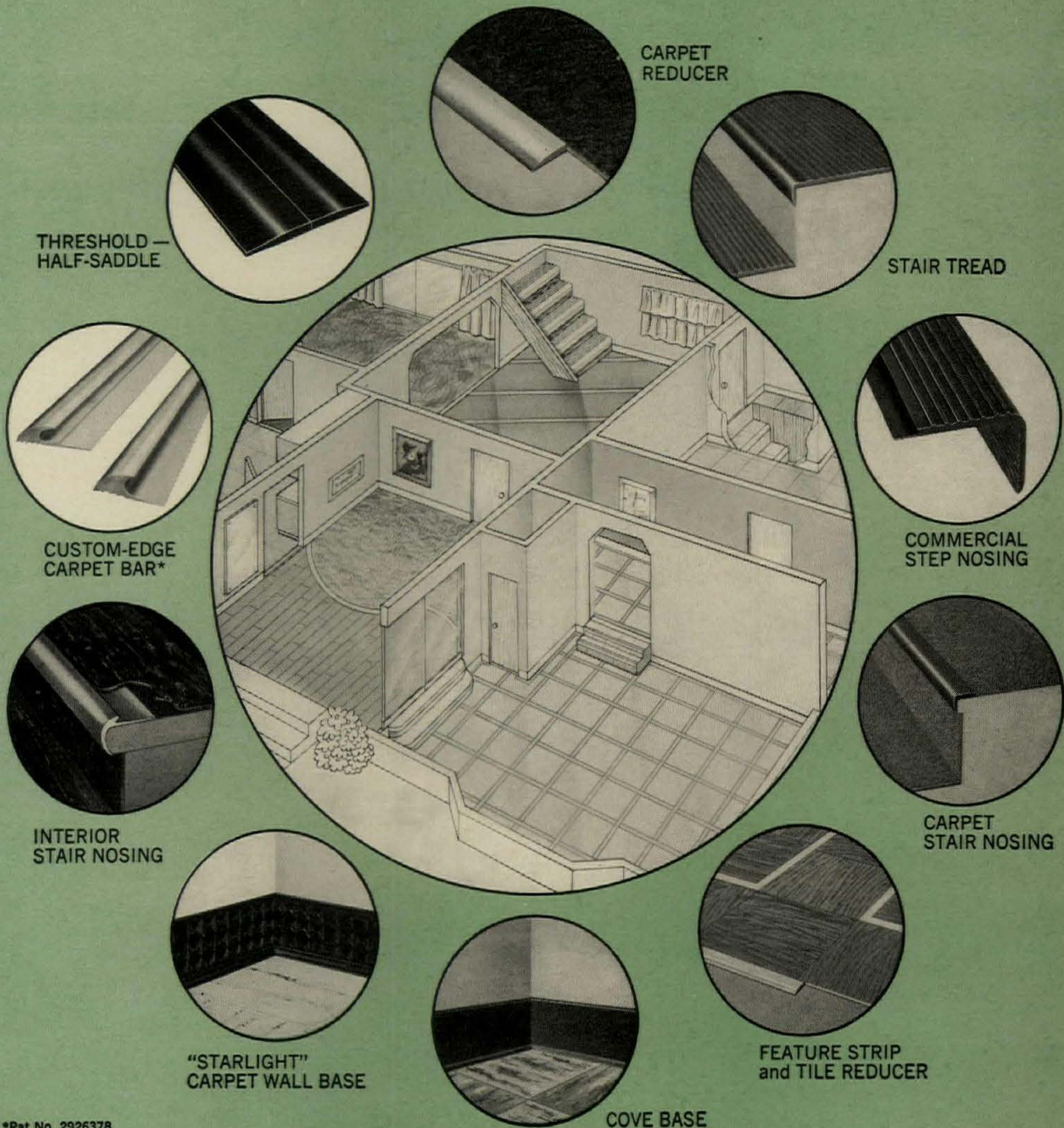
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*Additional product information in Sweet's Architectural File

more literature on page 256

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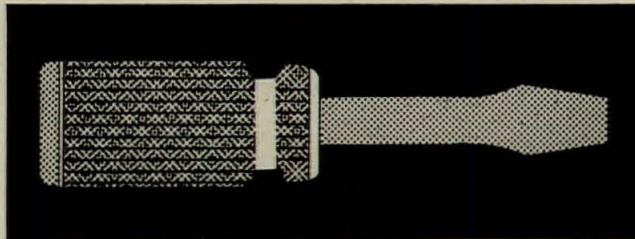
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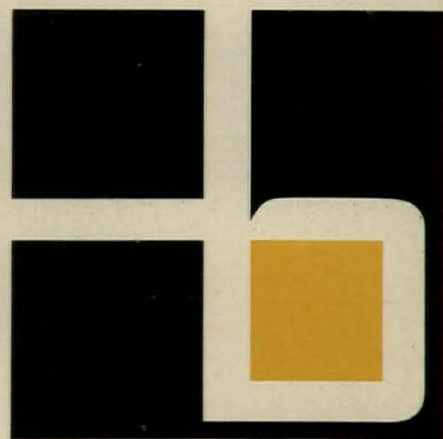
For more data, circle 69 on inquiry card

Bayley windows reduce

the mystery but none of the challenge of architecture. They save time initially because the new Bayley catalog of metal windows and curtain walls has the information you need for final design. And Bayley takes the guesswork out of window delivery—our computer keeps jobs on time.

Service by Bayley increases your confidence and cuts your

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BAYLEY

The William Bayley Company, Springfield, Ohio

For more data, circle 70 on inquiry card

continued from page 191



NOW YOU CAN SPECIFY A SOUND SYSTEM THAT PLAYS ON WHEN THE POWER GOES OFF!

With Altec's new 352A mixer/power amplifier as the heart of the sound system, your client's show can go on in spite of AC power failure. Chances of loss of revenue or audience panic are virtually eliminated, thanks to Altec's fail-safe unit!

When the line power goes off, the 352A switches automatically and instantaneously to emergency battery power for uninterrupted performance!

The 352A's all solid-state circuitry operates on a 12- to 14-vdc power source, permitting use of an ordinary 12-v car battery for standby. Fully charged, the battery will power about 30 hours of program input. A trickle-charger keeps the battery up while the 352A is on AC operation.

The compact, economical 40-watt 352A is a recording-type 5-channel mixer/amplifier that's especially suitable for churches, schools, theatres, convention halls, and auditoriums.

Modular in concept, with plug-in components for impedance matching,

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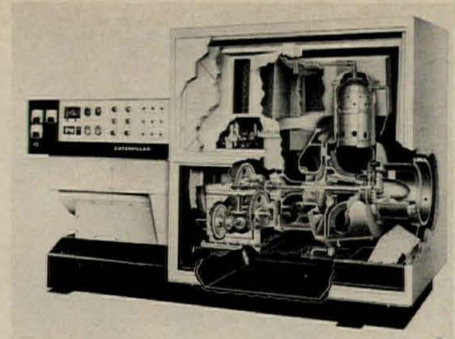
Each of the five inputs has a mixer control and speech/music equalizer and can be used with microphone, magnetic phono, or high-level line sources.

FOR COMPLETE DATA on this high-gain, full-frequency-range mixer/amplifier, check with your local Authorized Altec Sound Contractor or write Dept. AR-1. Indoors or out, where sound is important, the system is by Altec. Speakers, microphones, amplifiers, control consoles—all your sound system needs.



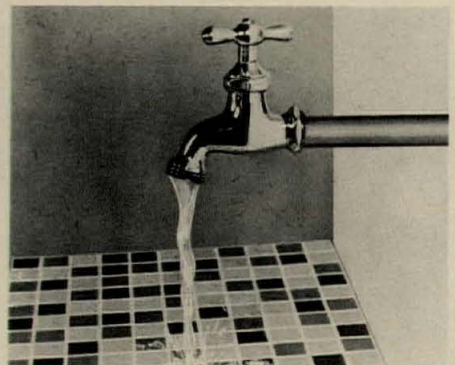
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GAS TURBINE / A 200 kilowatt gas turbine electric set provides low-cost electricity to industrial plants, schools, apartment buildings or shopping centers, while the turbine exhaust gas supply supplies the energy for heating, air conditioning and steam generation. Major components shown in the cutaway are, left to right, speed reducer and accessory drive section; single stage, centrifugal air compressor; combustion chamber and two axial flow turbine wheels. Directly below these units the lube oil sump and cooler are located in the engine base. ■ Caterpillar Tractor Company, Peoria, Ill.

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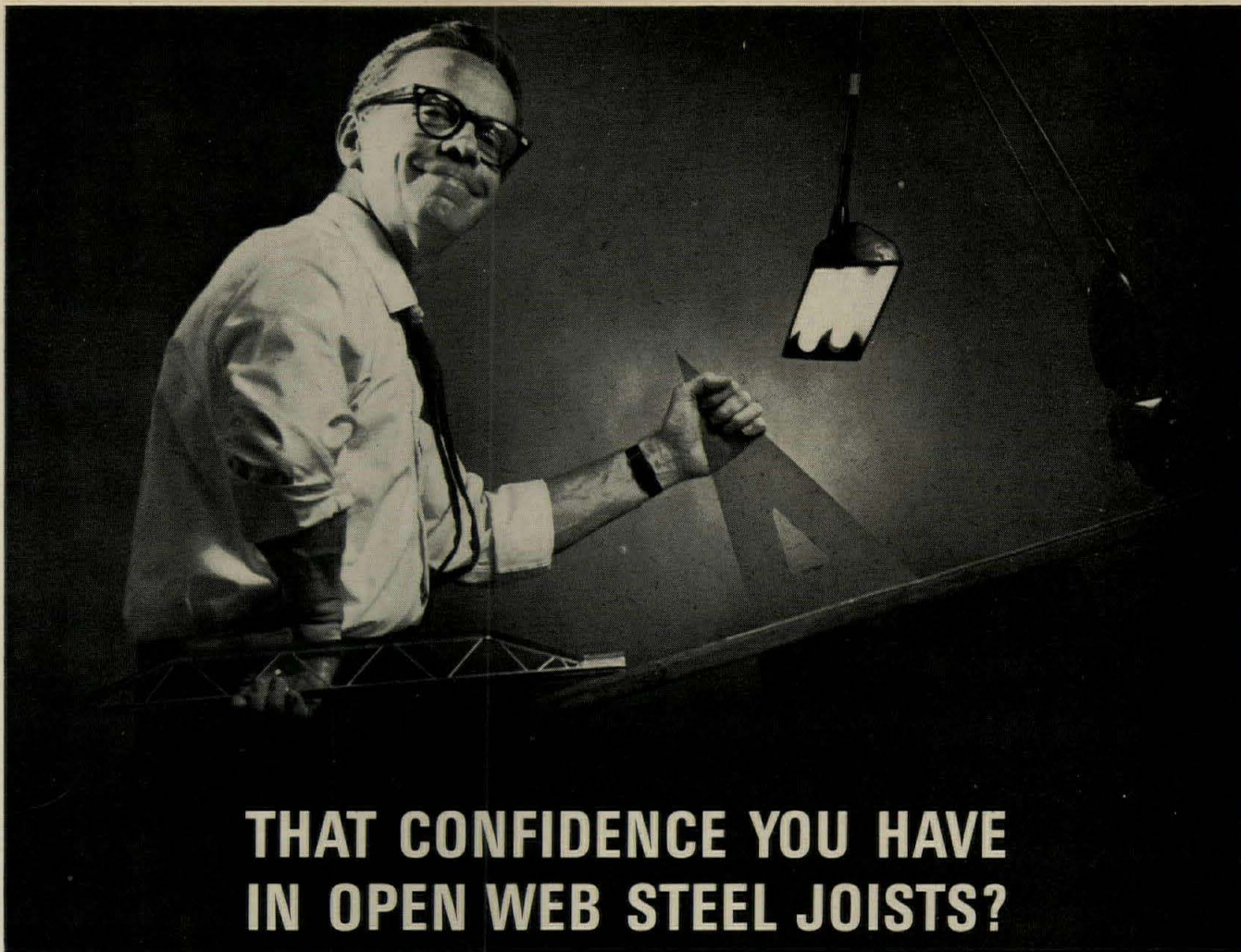


RESILIENT FLOOR COVERING / The combination of ceramic tiles with a flexible vinyl backing produces a floor covering which is said to retain its resilience for the lifetime of the installation regardless of traffic conditions. Each sheet of *Vico Ceramolok* contains 132 one-inch square ceramic tiles imbedded in a matrix of homogenous vinyl. *Ceramolok* may be bent during application and can be fitted easily around columns or irregular shaped surfaces without dislodging the tiles or weakening the vinyl matrix. The "vinyl waffle" cushion backing produces good sound absorption and quietness underfoot. The vinyl matrix is resistant to heat and moisture.

■ Amsterdam Corporation, New York City.

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more products on page 200



THAT CONFIDENCE YOU HAVE IN OPEN WEB STEEL JOISTS?

Chalk a lot of it up to the Steel Joist Institute!

Since 1928, a hard-working organization of dedicated men has been quietly helping to elevate the standards of a multi-million dollar industry.

The organization: the Steel Joist Institute.

Its purpose: to expand knowledge of open web steel joists; to encourage their use in modern building practice; to establish design and performance standards among joist manufacturers.

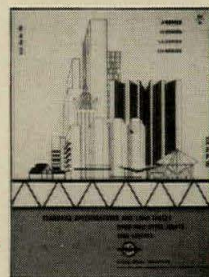
You benefit directly from this work by the Steel Joist Institute. You can feel a justified confidence when specifying open web steel joists, knowing that the researched design and simplified members that have improved joist performance are yours from many dependable sources.

Complete technical information on high strength open

web steel joists is contained in the 1966 edition of specifications and load tables, just published.

1966 Edition, Specifications and Load Tables for High Strength Open Web Steel Joists

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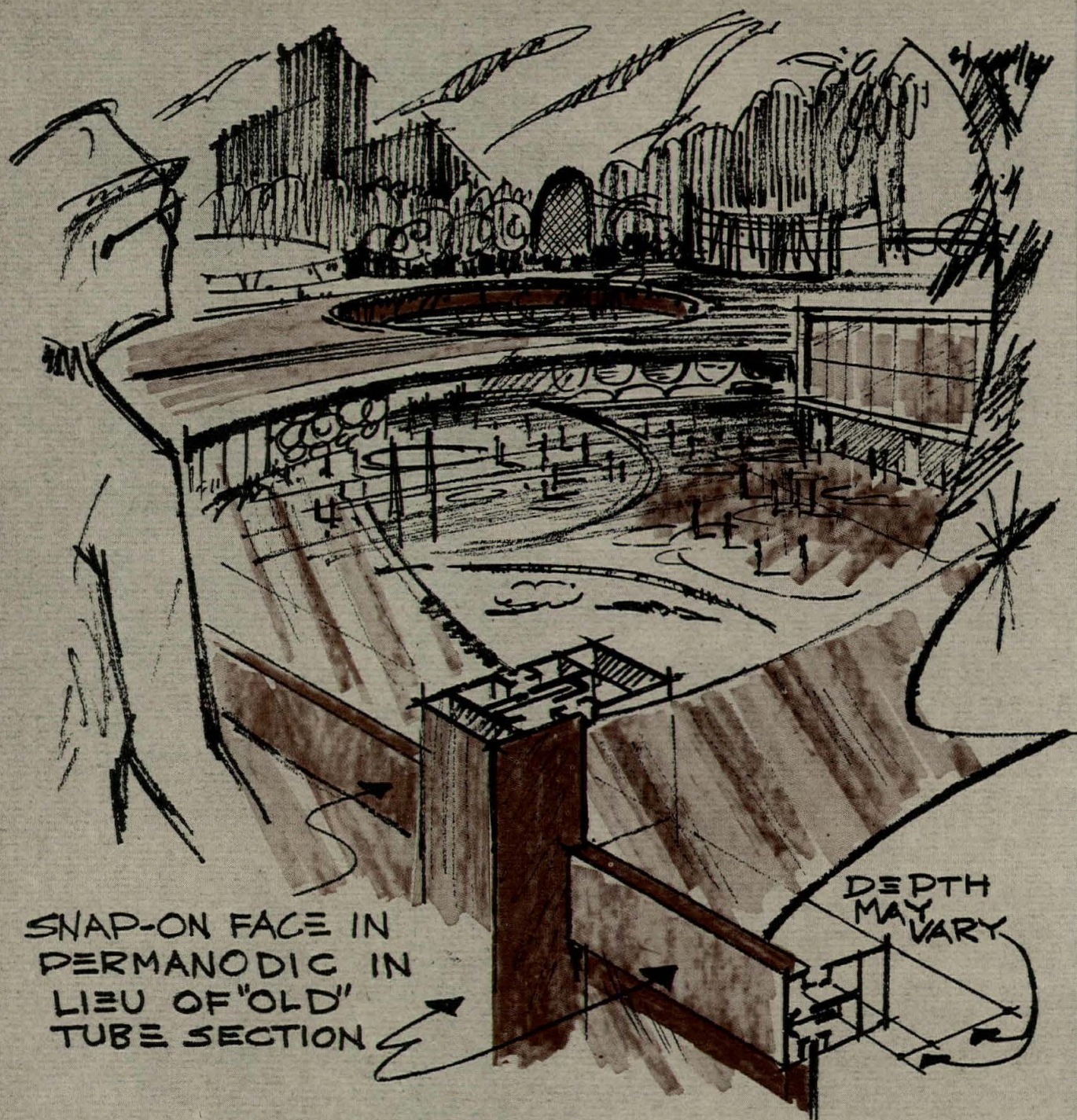
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SNAP-ON FACE IN
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TUBE SECTION

DEPTH
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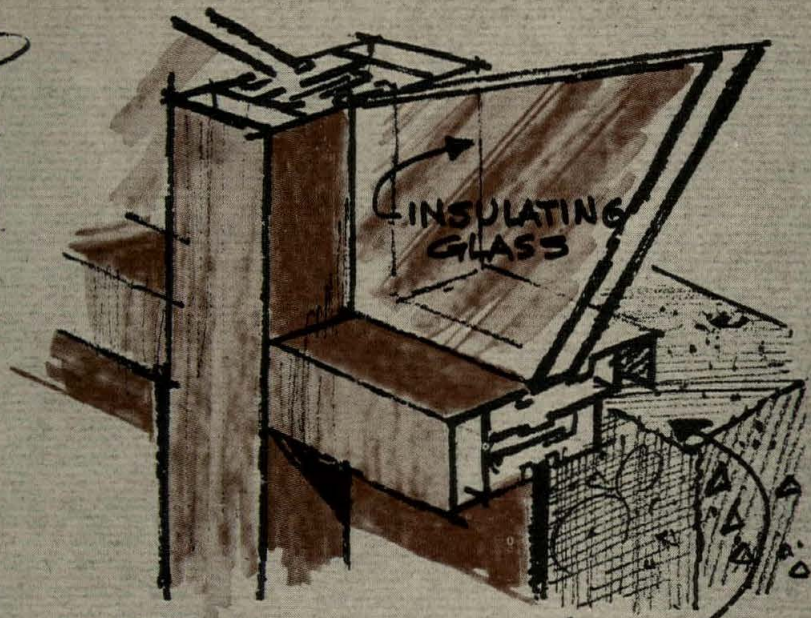
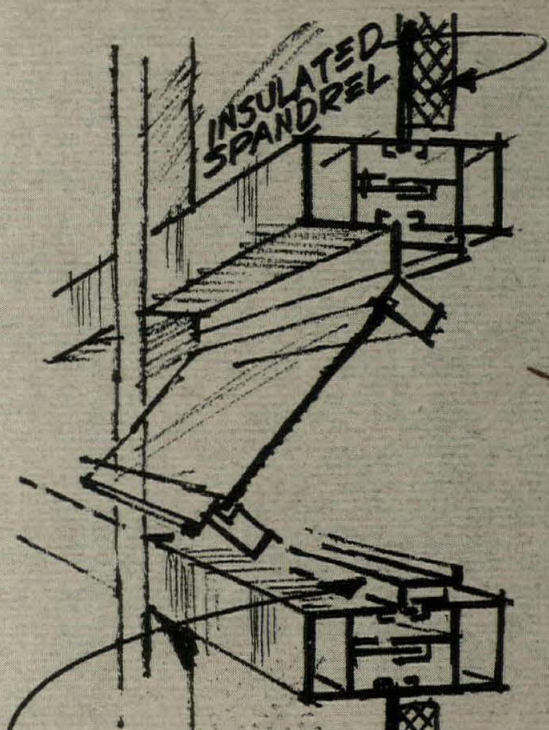
Look at what you can

This patented Aluminum Exterior Building System is a flexible design tool. Permits you to create a variety of grid fronts—each with a unified appearance—for new construction or remodeling applications. Better looking—with crisp, clean lines—and weathering advantages.

We think you'll like working with Core almost as much as a sculptor does with clay, because of the many effects it permits you to create. Where would you like the glass? Up front?

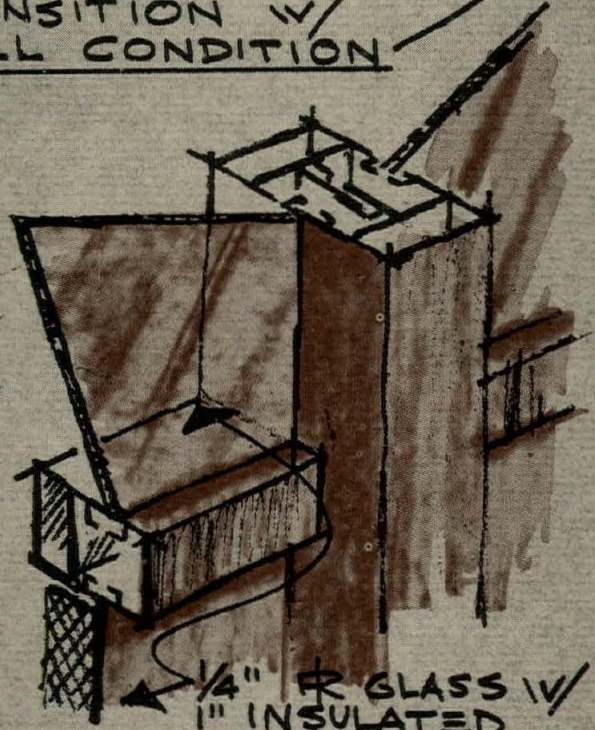
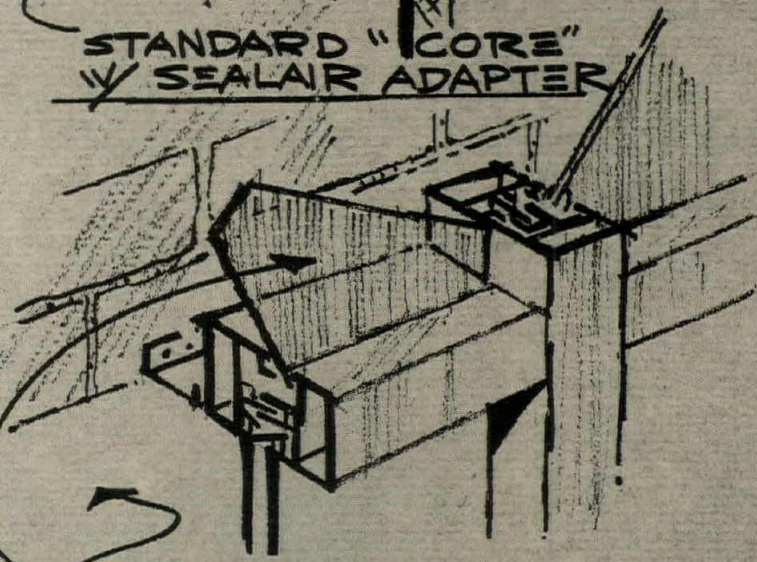
Middle? Back? Does your design call for equal or varying reveals? Do you want to accent the vertical mullions or give equal prominence to the horizontals?

This versatile system also permits you to go from 1/4 inch glass to 1 inch panels. It accommodates Kawneer entrances, concealed operators and closers, V-6 facings, Colorwall, Sealair windows, insulating glass and panels—all with uniformity. This is true even on tough remodeling jobs, which might otherwise look like a hodge-podge. And Core's "Snap and Lock"



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face glazing eliminates the unsightly clutter of exposed screw and stops. This feature also results in speedier erection and a very favorable installed cost.

*Interesting effects with Permanodic**—Kawneer Permanodic hard color finishes add warmth to your design. You can harmonize with colored lites of glass, panels, and facings. Core permits you to do this economically by combining colored Permanodic finished face members with Alumilite finished gutters.

Want more information about Core? Write for

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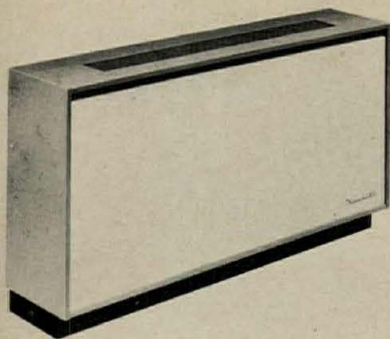


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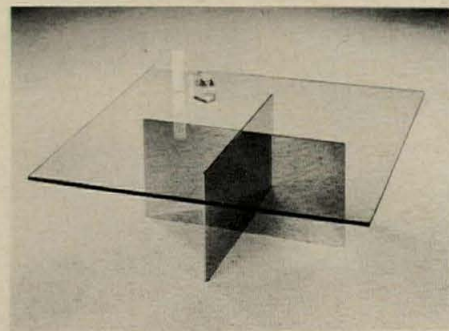
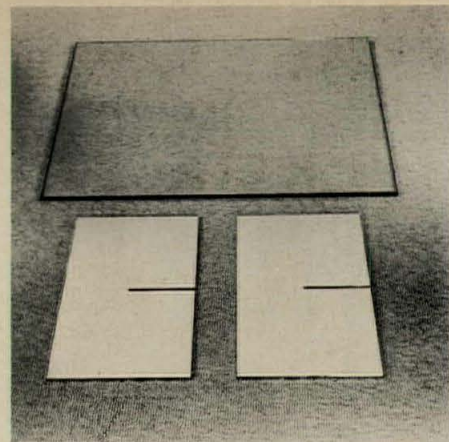
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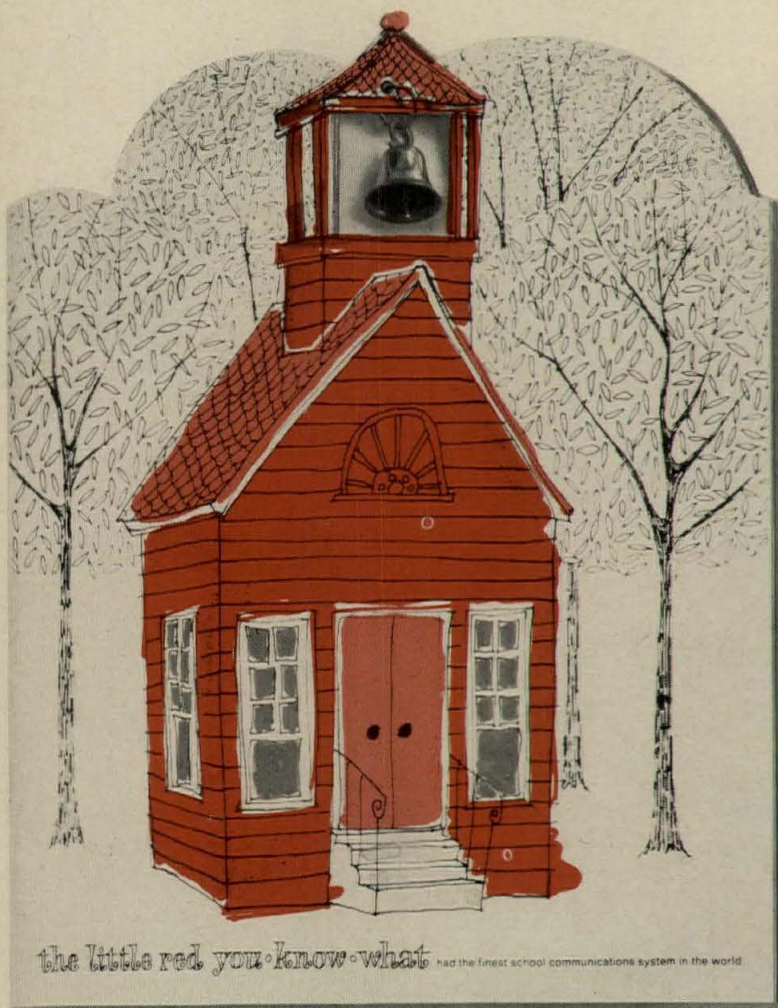
ROOM AIR CONDITIONER / The *Roommate III* year-round air conditioner was designed by Paul McCobb to co-ordinate the extruded aluminum discharge grilles and one-piece slab front into a clean-cut unit which would fit easily into different environments. The units are installed without expensive ductwork and are individually controlled, making them particularly suitable for hospital administrative areas and patients' rooms. ■ ITT Nesbitt, Philadelphia, Pa.

Circle 305 on inquiry card



KNOCK DOWN TABLE / Designed by Paul Mayen, this smaller version of the table shown at the last Milan Triennale is shipped knocked down in three sections. The table has a *Trexiloy* polished metal base, is 12½ in. high and has a 36-in. square glass top. The table has recently been added to the permanent collection of the Museum of Modern Art. ■ Habitat, Inc., New York City.

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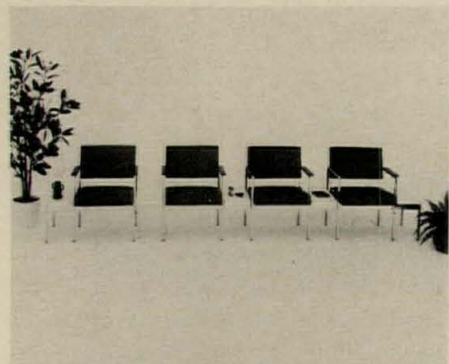
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Since 1894—"There is nothing finer than a Stromberg-Carlson."

For more data, circle 74 on inquiry card



MODULAR SEATING / The 440 series of modular seating units for lobbies, reception areas and lounges features one-, two-, three-, and four-cushion sectionals in a choice of double arm or armless styling, or an arm at the right or left. Benches in one- to four-cushion sizes and corner, t-shape, half and full module tables are also included. Frames are of heavy gauge cold-rolled steel with backs of 5-ply plywood. ■ Steelcase, Inc., Grand Rapids, Mich.

Circle 307 on inquiry card

more products on page 202



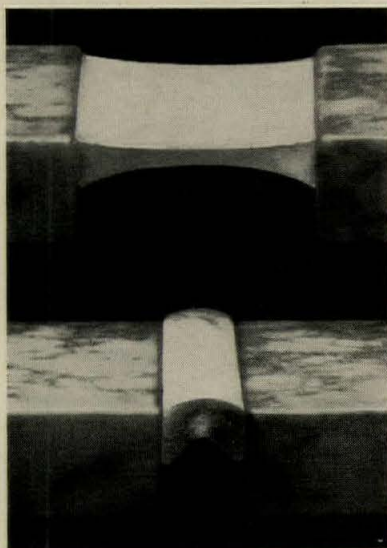
Alcoa Plaza Associates, Owner; Harrison & Abramovitz, Architects; Turner Construction Co. & HRH Construction Corp., General Contractors; General Bronze Corp., Curtain Wall Fabricator; Abbott Glass Company, Glazing Contractor.

9 tons of G-E Silicone Construction Sealant seal new UN Plaza

G-E Silicone Construction Sealant is an amazing synthetic rubber that cures in air. It's waterproof. It won't crumble, harden or peel. So it's the first really *permanent* sealing compound.

At the new United Nations Plaza apartment and office building, just across from the famous United Nations Building in New York City, nine tons of Silicone Construction Sealant were used for various sealing applications. Seven tons of Silicone Construction Sealant were used to glaze the windows. Another two tons seal the aluminum curtain walls. G-E Silicone Sealant is also used to caulk air ducts as well as miscellaneous caulking throughout the thirty-eight story twin-tower skyscraper.

G-E Silicone Construction Sealant applies quickly and smoothly from a



Joints expand and contract 10,950 times in 30 years . . . and so will G-E Silicone Construction Sealant.

standard caulking gun, forming a tight bond to glass, metal, masonry and other common building materials. No mixing either. And it can be applied easily in any weather . . . never stiffens in cold or runs because of heat. Cleanup is a cinch. So you save time while you get a good looking, permanent seal that minimizes callbacks.

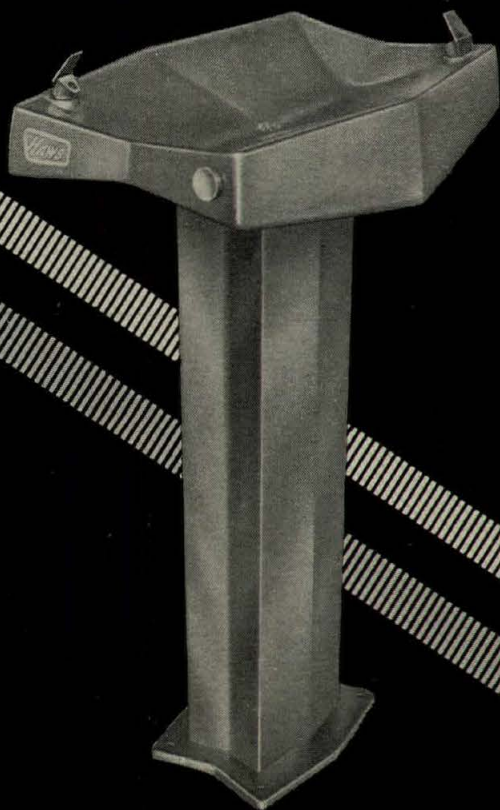
Available in a wide range of colors, as well as a translucent form, G-E Silicone Construction Sealant blends in well with almost any material. It's stocked by local distributors and in many building supply stores. For complete information, including a new bulletin on guide specifications for Silicone Construction Sealant, check the distributor nearest you, or write to Section BG1160R, Silicone Products Dept., General Electric Company, Waterford, New York.

GENERAL  ELECTRIC

For more data, circle 75 on inquiry card

Honor Roll:

MODEL 36DY



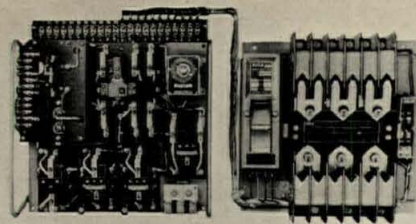
HAWS DRINKING FOUNTAIN Model 36DY—a popular choice for unique appeal in muted bronze Tenzaloy aluminum and twin chrome plated bubblers. Like all leaders it's rugged—in its hard anodized permanent finish for un failing service indoors or out. Stands tall against all weather and keeps looking young year after year. An exclusive product in the Haws tradition of distinctive design.

HAWS

Since 1909

For full, immediate details see Sweet's 29d/Ha; check your Haws Yellow Binder; call your Haws Representative; or write for spec sheet or for complete catalog to **HAWS DRINKING FAUCET CO., 1441 Fourth Street, Berkeley, California 94710.**

For more data, circle 76 on inquiry card



AUTOMATIC TRANSFER / The Asco 940 automatic transfer switch is a reliable, low cost control which can be used in hospitals, manufacturing plants, communications centers and wherever emergency power under 125 amps is needed. Rated at 40, 80 and 120 amps to match generator set sizes, the Asco 940 is mechanically held and electrically operated, and has a contact-to-contact transfer time of about one twentieth of a second for all classes of loads up to 600 volts. Loads are transferred automatically to an emergency source as soon as power fails, and are then retransferred to the normal source as soon as power is restored. ■ Automatic Switch Company, Florham Park, N. J.

Circle 308 on inquiry card



ALUMINUM LOUVERS / A rubber mallet is the only tool required to install blades into the frame of the new K-D louver system, which can be shipped knocked down for rapid assembly at the job site. The stationary louver system includes blades in a wide range of sizes and types. Costs are said to be lower than comparable preassembled systems where conventional screw, rivet or welding assembly methods are used. ■ Construction Components, Inc., Los Angeles, Calif.

Circle 309 on inquiry card

more products on page 228

For more data, circle 77 on inquiry card



Why Central chose Modine Valedictorian

This reason's name is Jenny. Some of the other reasons are Janet, Charlie, Kim . . .

After all, they're the most important reasons why anyone should choose a modern Valedictorian unit ventilator for classrooms. It creates a perfect environment for them—comfortable, and healthful, too.

That's because Valedictorian is designed to handle the *entire* air

conditioning function — heating, cooling, ventilating and dehumidification (or any part, if you like).

A built-in "weather center" controls Valedictorian's unique full damper system. It stays sensitively alert to the class' needs and responds with fresh, filtered air at the right temperatures — before Jenny or any of the other "reasons" even begins to feel discomfort.

The response is automatic.

By the way, Valedictorian is so quiet you can whisper over it. Listen to one and hear for yourself.

The name is Valedictorian. It comes from Modine in a rainbow of decorator-color enamel and vinyl finishes. And it costs a lot less than you might think.

How many reasons do you have to use Valedictorian in your school?

V1524



MODINE

1510 DEKOVEN, RACINE, WIS. 53401

For more data, circle 103 on inquiry card

continued from page 236



*nobody but nobody
designs disposers with as many
woman-pleasing features
—as In-Sink-Erator*

In-Sink-Erator is engineered for satisfying maintenance-free service —with the quality features every woman wants!

Ask any woman with one in her kitchen what's so unique about In-Sink-Erator Model 77. Better yet, check its practicality, performance and extra-value features yourself.

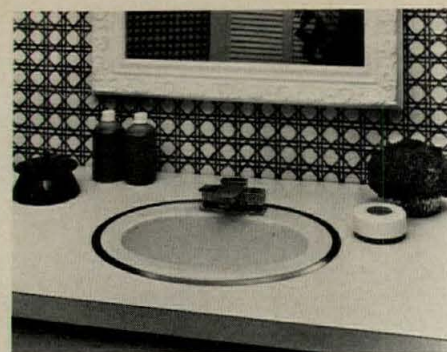
This disposer grinds in both directions, doubles shredder life, thanks to patented Automatic Reversing Switch. The exclusive Self-Service Wrench clears accidental jams fast. Result: Fewer customer complaints and costly call-backs. Corrosion damage? Exclusive Detergent Shield protects against harmful caustic agents.

Also a full 5-year warranty—best in the industry—guarantees user satisfaction. And there are quality In-Sink-Erator models for homes and apartments in every price range. Write for full information and special "personal-use" disposer plan.

ISE[®] In-Sink-Erator[®]
Originator and perfecter of the garbage disposer

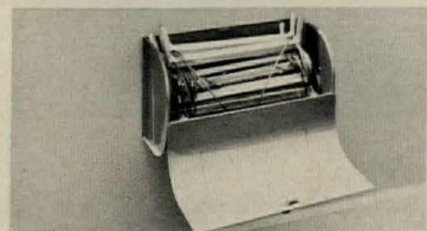
IN-SINK-ERATOR MANUFACTURING CO. • RACINE, WIS.

For more data, circle 104 on inquiry card



PLUMBING EQUIPMENT / The company's Ovation enameled, cast iron counter-top lavatory is available in a range of seven *Highlight* colors. The lavatory measures 19 in. by 16 in. and features a concealed front overflow drain and sculptured soap dish. ■ Universal Rundle Corporation, New Castle, Pa.

Circle 317 on inquiry card

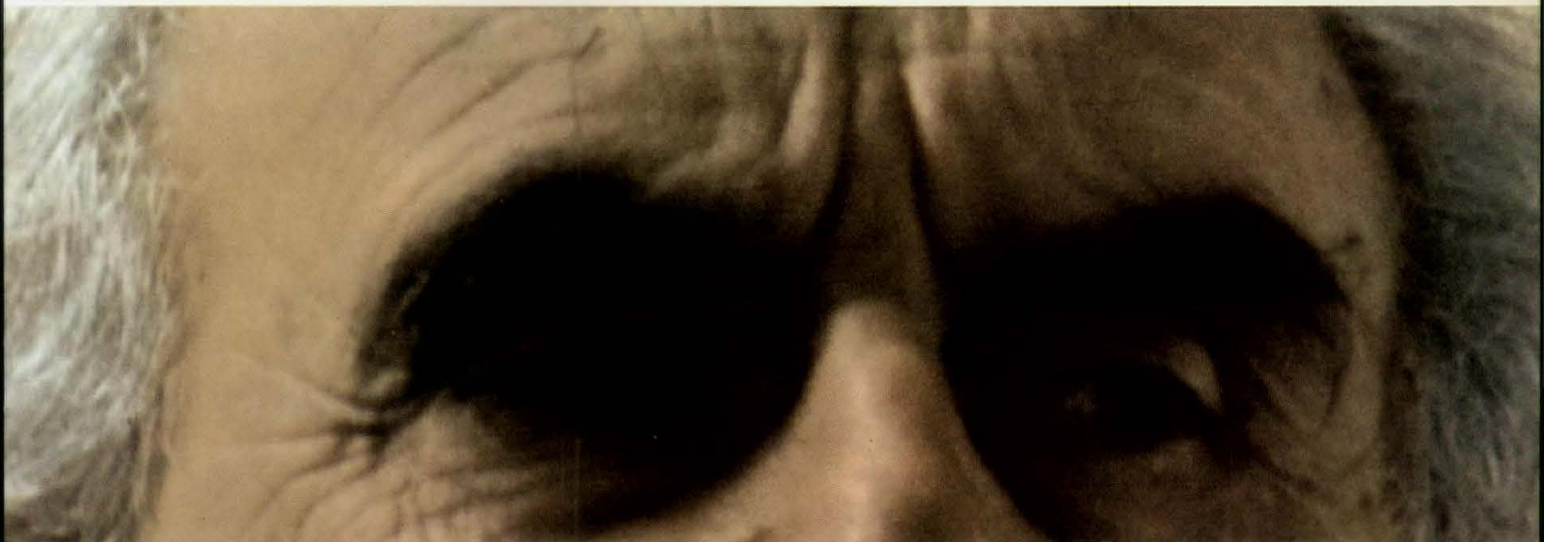


COLLAPSIBLE LADDER / This escape ladder, which is housed in a wall-mounted unit, measures only 16 in. by 7 $\frac{1}{8}$ in. by 9 $\frac{1}{4}$ in. when collapsed. The unit can be attached to the wall with two screws, and the ladder is said to accommodate up to 420 lbs. per rung. The all steel construction of wall unit, rungs and strands make the ladder particularly suitable as an emergency fire escape. ■ Tru Saf-T-Ladder Company, Madison Heights, Mich.

Circle 318 on inquiry card

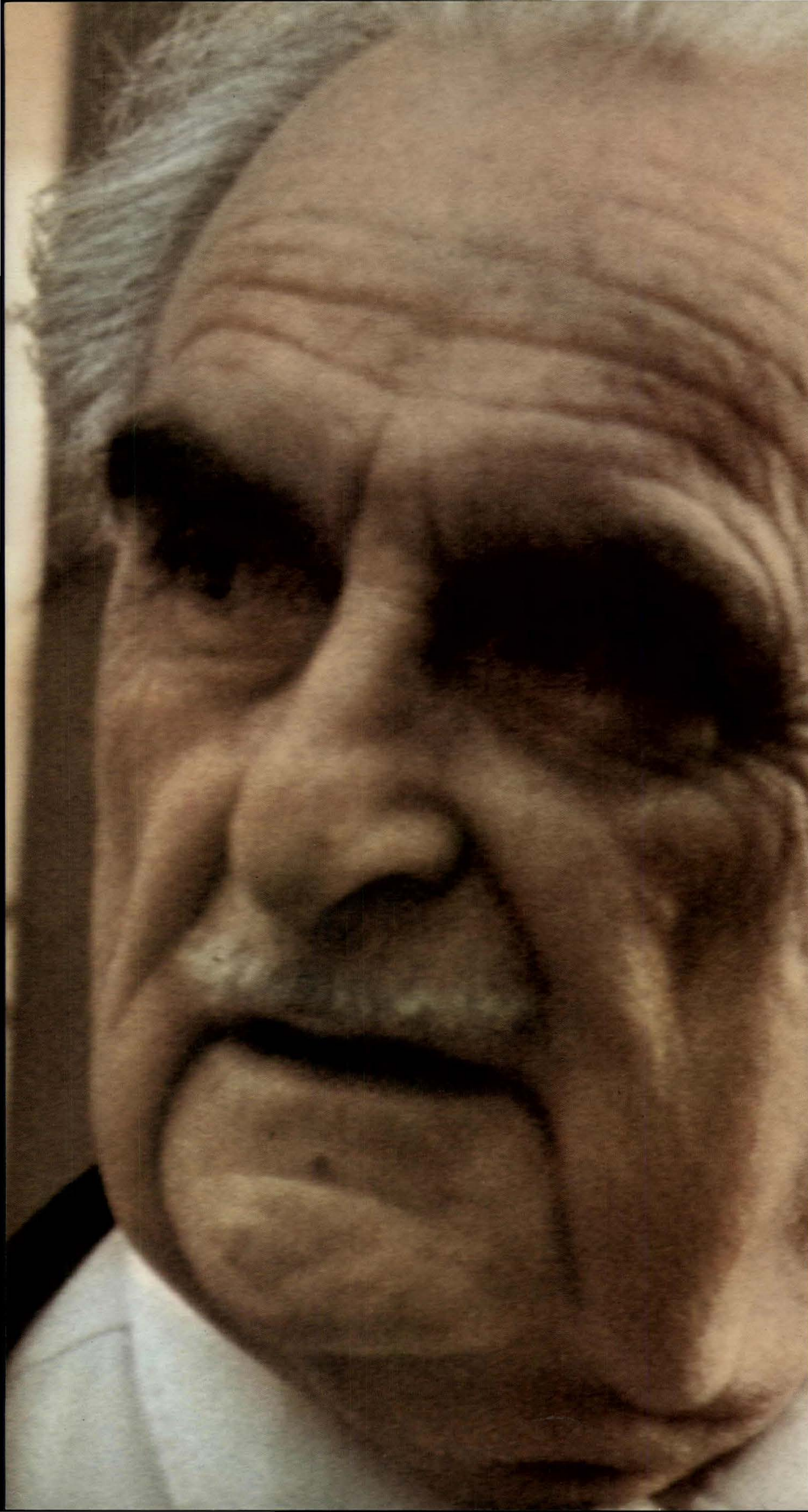
For more data, circle 105 on inquiry card

F A SERIES



*“Cities are not ‘practical’ if they
are full of irritation and fatigue.”*

RICHARD NEUTRA



*We have been talking
Richard J. Neutra about car-
pets, because we think carpets
should be a concern of archi-
tects. Here we ask Mr. Neutra
about carpeting in public
places.*

Richard J. Neutra ca-
public buildings, buildings for
"humans in groups," which
a revealing definition. He al-
ways thinks of architecture
serving the individual. And
for Neutra the individual
best served when architecture
is biologically based — when
the architect knows and re-
spects man's responses to en-
vironmental stimuli. Neutra's
goal in the long run is inn-
organic balance, which, if we
simplify, we might call seren-
ity. Serenity is harder
achieve in a building for "hu-
mans in groups" than in a
one-family house, but it is still
the goal. "Cities are not 'pra-
tical' when full of irritation,"
Neutra says.

"...we perish not only by
crashes but also by millions of
minute collisions of our nor-
mal human biology with what
new technology lets loose
against it...that some eighty
million suffering Americans
cool their too-hot heels in psy-
chiatric waiting rooms is not
an accident, but looks like an in-
dictment of our glorified man-
made metropolitan world."

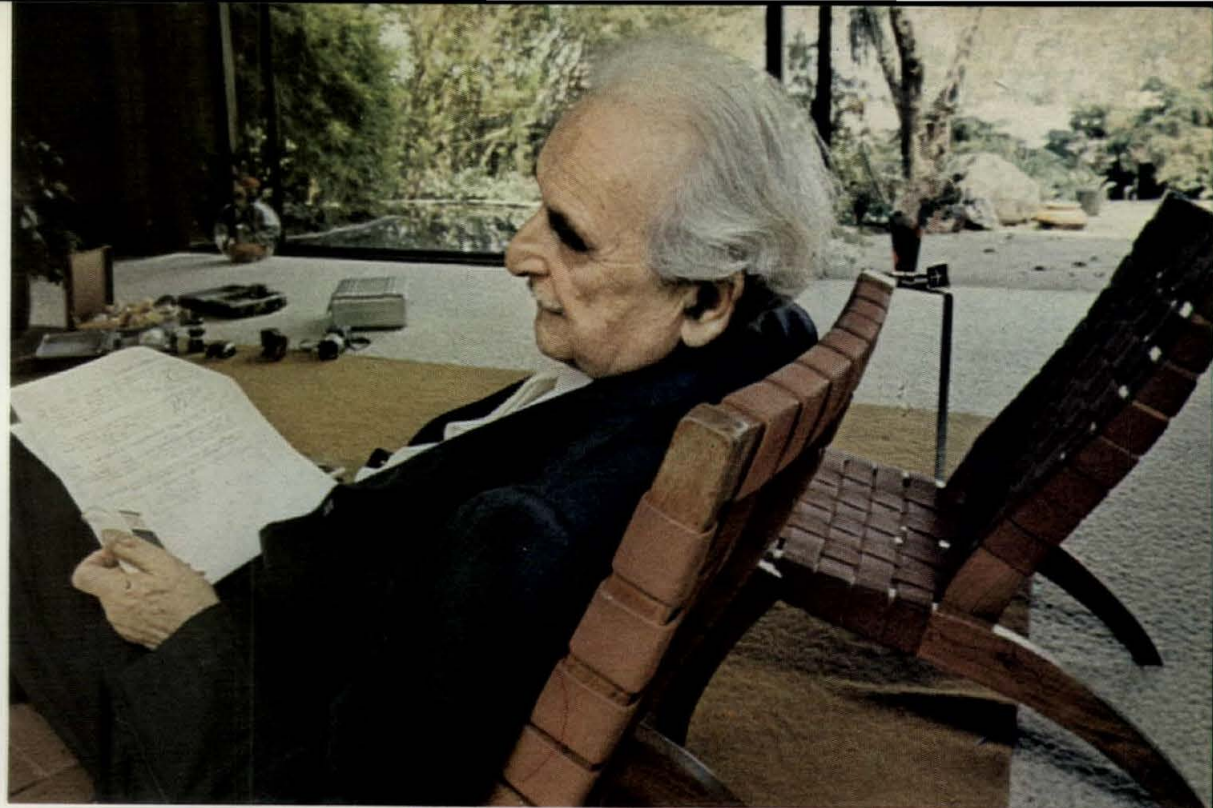
Neutra holds the archite-
tural profession high. He sees
architects as healers, healing
the assaults our bustling civi-
lization lets loose on us.

His work over a long li-
time has included clinics, schools,
libraries, hotels, medical cen-
ters, planetariums, office
buildings, embassies, churches,
theaters, counting houses,
clubs, housing projects, hospitals.

***"I love to see architects as healers,
healing the assaults our bustling
civilization lets loose on us."***

Because we know Neutra's great love is schools (he was signing ring-plan schools in the '20s), we asked him how he felt about carpeting the classroom. He said tension is created for the young child when he is taken to school and forced to sit properly at a desk. In his own time the preschool child does most of his learning on the floor. The child is more at home at school if he can learn while sitting on a homelike floor in homelike surroundings. From a more relaxed beginning he may be more at home with learning all his life. (It is not surprising to find Neutra has had a public school named after him as an educator.)

Neutra then turned to the subject of carpets in hospitals. "I have myself been a good deal sick in hospitals and have given a great deal of thought to how patients can be helped in the hospital faster so that their rooms may be used by others waiting to get in. Certainly quiet hallways and rooms aid recuperation. Why



"Architects can make decisions friendly to life."

should we poison a patient with the toxic effects of loud noises? Carpets absorb the noise. Now, if you say surfaces in a hospital have to be daily washable to be clean, you may be dead wrong, if we listen to some scientific experts in Europe. Many strains of microbes are often smeared into joints and any indentations where their cultures

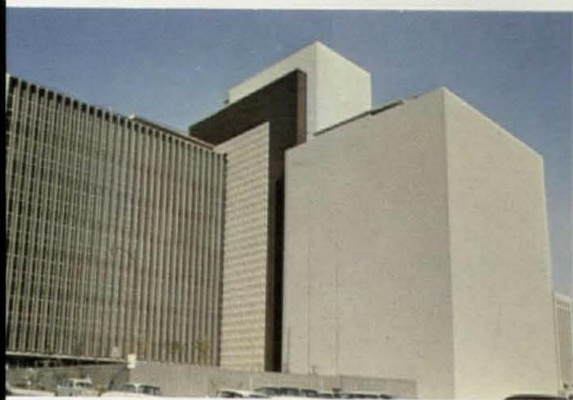
multiply and flourish. You may be better off with bone-dry carpeting, suction cleaned. What's wrong with a vacuum cleaner?" Neutra exclaimed. "We keep pretending a mop and pail are the easiest and most efficient way to clean a public floor. They aren't."

We nodded, remembering our trip to Garden Grove, California, to the Garden Grove Community Church which Neutra recently built—a community church wide open to nature. People may sit in their cars and hear the services or come within the church which seats 900. The maintenance man told us that the carpeting there had given him less trouble than any floor

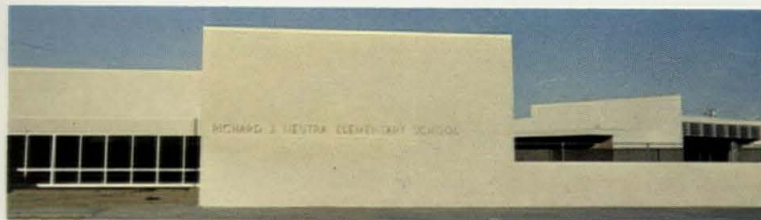
he had ever taken care of. He was taking into account the spot-cleaning he had to do when an occasional pious bird flew in through the huge, opened, sliding glass panels next to the pulpit platform. (The superintendent also mentioned how nice it was not to hear the tap-tap-tap of heels when ladies come late to services.)

We also thought of the Mariners Medical Building at Newport Beach, California, to which Neutra had given loving care. Here there is carpeting even in the dentists' rooms. It is a calculated part of an overall plan to take the patient's mind off the drill. The place is a peaceful haven, and

"Automatic movable louvres compensate for the rotation of the earth, so that office workers live through the day with less fatigue." Los Angeles Hall of Records. Hall of Records Architects.



"A clinic can be homelike." Mariners Medical Center, Newport Beach, California. Neutra & Associates, architects.



"Environment moulds our minds more than a textbook." The Richard J. Neutra School, Lemoore, California. Neutra, Alexander and Haines, architects.



Rock wall and carpeted floor absorb sound while glass lets in the outside. Garden Grove Community Church, Garden Grove, California. Neutra and Associates, architects.

"Even a dentist's chair can seem like an oasis." Mariners Medical Center, Newport Beach, California. Neutra & Associates, architects.



one feels nothing could hurt much there.

Switching to his basic philosophy, Neutra said he felt architecture boils down to an issue of vitality versus fatigue. He pointed out that office workers can accomplish as much in the afternoon as in

the morning hours when offices are planned to keep out irritating agents. Carpets are an aid in quieting, calming. And they are less tiring to walk on. They help get eight hours of efficiency—"a lot more than coffee breaks do."

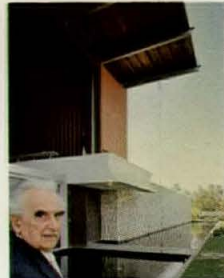
"We know that carpeting muffles airborne sounds as well as footsteps," Neutra continued. "It is needed in housing projects. I'm all for loving your neighbors and having your neighbors love you. The privacy carpets provide makes neighborly love a little more possible."

"You can use carpets to keep people not only less bothered by noise, but calm in their interior, having less of the kind of endocrine discharges which make them what you call harried citizens."

Neutra threw up his arms in a gesture of summation. "Carpets are a healthy, harmless sedative—serenity bought in no drugstore."



The Garden Grove Community Church seats 900. Round projections from the ceiling are amplifiers.



Exterior of Garden Grove Community Church showing sliding glass panel, next to pulpit platform, just above Mr. Neutra's head.

Carpets of our fibers, Acrilan® acrylic and Cumuloft® nylon, do well in public places. They are man-made—specifically developed to be beautiful, long wearing, and resilient under heavy-traffic conditions. And they are easier to maintain than other carpets. May we tell you more? Write Carpets for Architects, Chemstrand, 350 Fifth Avenue, New York, N.Y. 10001. On Readers Service card circle No. 313.

If Herman Nelson classroom unit ventilators cost a little more ... why do so many budget-wise architects select them as the base bid?

Simply put: they're designing a far greater value into their schools.

A 5% saving on unit ventilators for an average school represents a savings of about .32% of the total school cost. And that .32% can begin to look smaller and smaller in a few years should the lower-cost units need replacement, as they did recently in one Long Island school.

We don't say that Herman Nelson heating, air conditioning, ventilating unit ventilators are ten times better-built than others. Not even twice so perhaps. But they *are* worth any slight difference you *might* have to pay. Here are some reasons why:

ONE-PIECE UNITIZED FRAME (something you'll probably never even see) helps make sure Herman Nelson unit ventilators last as long as your building.

DRAFT/STOP DESIGN captures chilling down-drafts from the windows without adding additional (and unneeded) heat to the room.

5-YEAR WARRANTY (Type G units)—Covers *both* parts and labor should our units not perform as we promised. It backs up your decision to specify Herman Nelson with *action*, not talk.



If we build them a little better than the others, it's for a good reason. We want them to last the life of the school building. We think you do too. Write for the new booklet "*Architects Are Ingenious People—and the Ways They're Using Unit Ventilators Today Prove It.*" American Air Filter Company, Inc., 215 Central Avenue, Louisville, Ky., 40208. In Canada: American Air Filter of Canada, Ltd., Montreal 9, Quebec.

FAR-SIGHTED PLANNERS CHOOSE HERMAN NELSON.



Herman Nelson
SCHOOL PRODUCTS DEPARTMENT

For more data, circle 110 on inquiry card

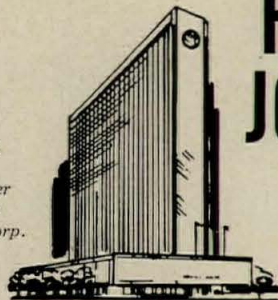
continued from page 192

At The New York Hilton Hotel it's

HYDROMENT JOINT FILLER

for quarry tile
and brick pavers

NEW YORK
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Architect:
William B. Tabler
General Contractor:
Uris Building Corp.
Tile Contractor:
A. Tozzini
Tile Works, Inc.



When you specify Hydroment Joint Filler you're giving your clients "joint insurance" because this tight, non-shrinking material provides long life and easier, faster clean-up and maintenance. Superior to conventional tile grouts, it's easier to apply on the job, eliminates conventional mixing errors! Specify Hydroment for quarry tile and brick paver installations in kitchens, cafeterias, hotels, restaurants, hospitals, food plants and industry. Comes in seven architecturally designed colors, natural, black and white.



PORTLAND
HILTON HOTEL

Architect:
Skidmore, Owings
& Merrill
General Contractor:
Anderson-Westfall
Co., Inc.



Tile Contractor:
Multnomah
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**TILE-MATE is at
The Portland Hilton, too!**

Tile-Mate is the high shear bond strength self-curing thin bed mortar used at impressive construction sites throughout the nation. Use with ceramic tile or glass mosaics over dry wall board, foam styrene, concrete block or any masonry surface in a setting bed as low as $\frac{3}{32}$ " to $\frac{1}{8}$ " thick.

catalog on request!

THE UPCO COMPANY

4805 Lexington Ave., Cleveland 3, Ohio

In the West: HYDROMENT INC., 829 N. Coffman Drive, Montebello, Calif.

For more data, circle 111 on inquiry card

AIR WASHERS / A line of models featuring exclusive *Hexapack* cells are the subject of a recently published bulletin. The bulletin contains a detailed discussion of the *Hexapack* cell, which is an improved air-washer filtering element made up of multiple layers of plastic resin-impregnated wood fiber sheet in a metal frame housing. The cell's operating process is explained and results of dust collection air cleaning tests are reported and documented. Each of the broad use categories for the *Hexapack* cell—air cleaning, humidification, cooling and dehumidification, and evaporative cooling—are discussed in detail. Dimensional data, air handling capacities and operating weight are also included. ■ American Standard, Industrial Division, Detroit, Mich.

Circle 411 on inquiry card

LIGHTING FIXTURES / A new line of imported Danish metal and glass decorative lighting fixtures for hotels, motels, restaurants and residential installations are the subject of a 4-page brochure. Complete specifications including size, colors, electrical data and accessories are included. Ten different styles of the fixtures, known as *Art Metal Danlite*, can be obtained through electrical wholesalers in this country. ■ Art Metal Lighting Division, Wakefield Corporation, Cleveland, Ohio.

Circle 412 on inquiry card

ROOF INSULATION / The company's *Gold-N-Kote* roof insulation system for adequate fire and wind safety of metal roof decks is described in a 4-page folder. The system has received the approval of Underwriters' Laboratories and Factory Mutual Engineering Service. Specification data and charts on thermal conductance, resistance factors and insulation thickness requirements are included. ■ Flintkote Building Products, East Rutherford, N. J.*

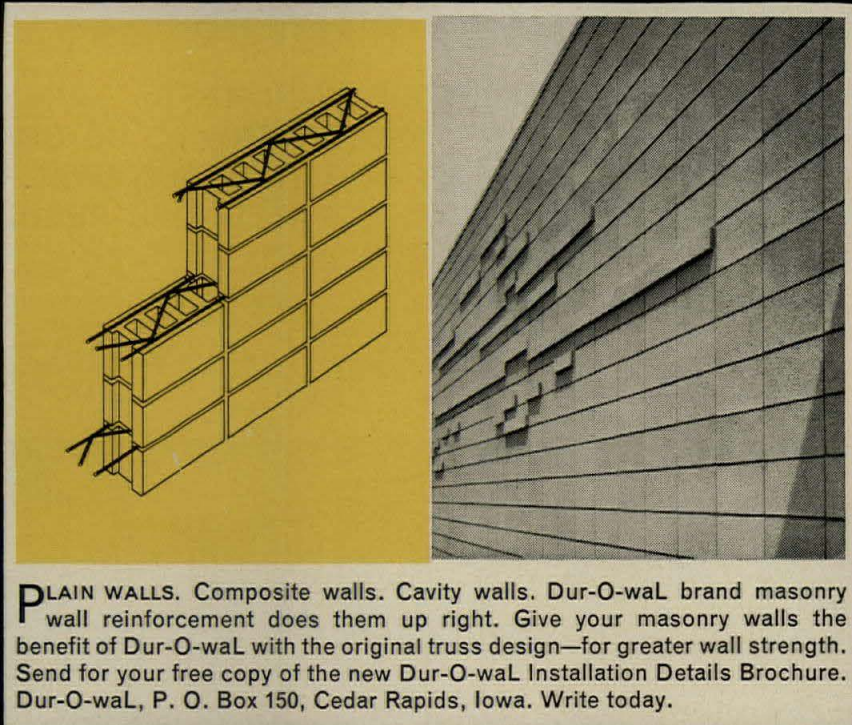
Circle 413 on inquiry card

WOOD SEALER / *Watco Danish Oil Finish*, which seals, primes and finishes wood in one application is described in a well illustrated brochure. Preparation and application instructions are given in a number of illustrated stages. Technical data includes coverage, viscosity, specific gravity and details of compatible wood finishes. ■ Watco-Dennis Corporation, Santa Monica, Calif.

Circle 414 on inquiry card

*Additional product information in Sweet's Architectural File

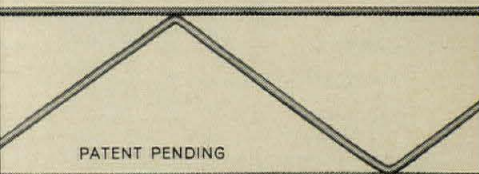
More literature on page 260



PLAIN WALLS. Composite walls. Cavity walls. Dur-O-wal brand masonry wall reinforcement does them up right. Give your masonry walls the benefit of Dur-O-wal with the original truss design—for greater wall strength. Send for your free copy of the new Dur-O-wal Installation Details Brochure. Dur-O-wal, P. O. Box 150, Cedar Rapids, Iowa. Write today.

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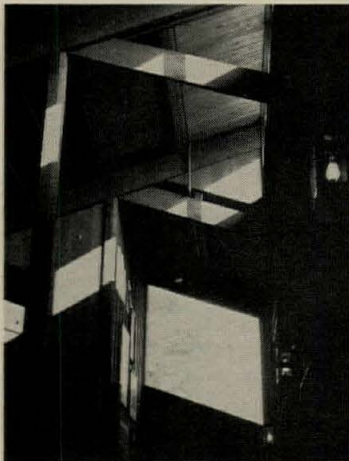
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**“WOOD IS HONEST.
IT DOESN'T TRY TO BE SOMETHING ELSE
AND NO OTHER MATERIAL WOULD
HAVE CREATED THIS RESULT.”**

JOHN STORRS, ARCHITECT / SALISHAN LODGE / GLENEDEN BEACH, OREGON

Salishan Lodge, a new resort and convention center, is located on Oregon's Pacific Coast, just 90 miles from Portland. Architect John Storrs, noted for his works in Western Woods, gives us a tour of Salishan.



Lights and shadows play on the rustic interior of the Attic Lounge, with 3" x 16" Douglas Fir beams and 2 inch tongue and groove Hemlock decking.

"I used to sleep in an attic as a kid, up under the beams and the roof. I tried to capture that feeling here."



"Oldtime notching and bolting is really not finished work. Far from it. It's simple and allows for error. But, you don't notice it and it doesn't bother you if you do anyway."

Under a covered walkway (below) Storrs talks about his architecture. **"People use the phrase, 'Japanese-style' when they see Salishan. But there's a big difference between Japan and the Oregon Coast. Everything here is machine cut and you have to take the consequences."**

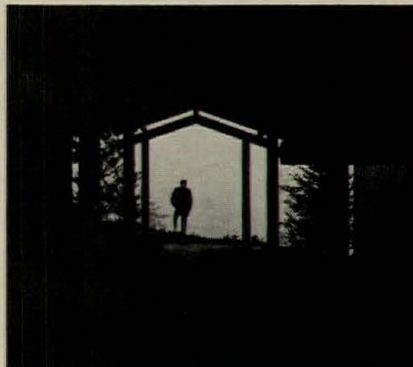


The exterior of the main lodge buildings are sided with resawn Western Cedar.

"Board and batten lets you introduce any window pattern you want. We've softened the old-fashioned bat a bit. This rough wood is more permissive and takes rain with ease. The grain is magnificent, especially when you stain it. You get a layering quality."

Every building in the Salishan complex (below) is connected by covered walkways of 2 x 12 Western Cedar set board on board.

"This structure had to occur. The tree was there; the roof had to be high enough for the trucks to go under. Since my overall statement on Salishan was basically simple, so, too, was the solution. Just nail the boards, boys. I couldn't have done it in my office."





The lodge entrance shows how well Western Wood works with other materials, such as the native rock found on the Oregon coast.

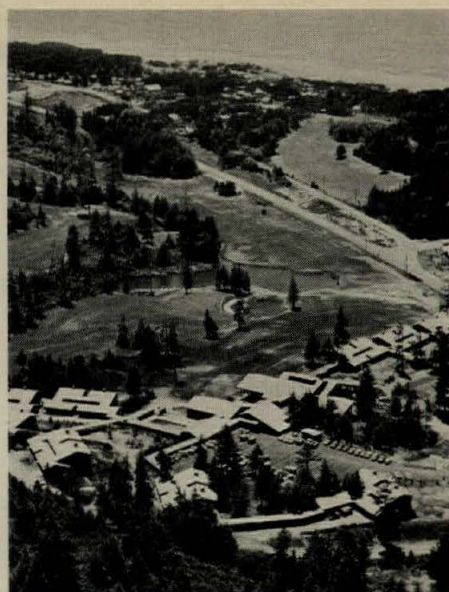
"Western Wood is so many things. It's soft, it's hard, it's rough, it's shapely, it's warm, it's romantic. And it has structure. This is why I use it. I've been told that Salishan looks like it has been here for years. Once, I might have resented that. But as I grow older, I realize this is a great commodity of architecture. How do you create a timeless building? It must be honest and honesty is a faculty Western Wood enjoys more than any other material. Wood will always be in date."

The fact that Salishan Lodge with its 100 units was completed in less time than many homes attests to Western Woods' availability.

"There is very little here that is special. Everything has been on the market a long, long time."

Storrs on the general use of wood:

"People put too many artificial restrictions on it. I use wood as a native material in its natural way. Old-timers went further in extending wood than many modern codes permit. Their structures are still standing and being used every day. And, wood is not wallpaper. It's going to get peanut butter on it."



Just eleven months after the developer approached Storrs with the idea, Salishan rests completed, over-looking the rugged Oregon coast.

"The scale turned out wonderfully. There was a continuism of the land to work into. All the buildings fit; they belong here. Salishan is one material, one color, one type of cutting, everything in repose. I don't know whether to call it an architecture of restraint . . . of boldness . . . or a combination of both."

Discover the many sides of western Wood and how it can work for you. Clip the coupon and we'll send you the Western Lumber Technical Manual, free, of course.



Western Wood Products Association

Dept. AR-166, Yeon Building, Portland, Ore., 97204.
Please send the Western Lumber Technical Manual.

Name _____

Firm _____

Address _____

City _____

State _____ Zip _____

continued from page 256

REGISTERS AND DIFFUSERS / A catalog and a technical manual are now available for this line of registers, grilles, diffusers, screws and blind rivets. The 40-page catalog covers dimensions, free areas, packs, weights and list prices. The manual, published in compact form, provides performance data and other relevant information for those involved in the layout and design of heating and air conditioning systems. ■ Leigh Products, Inc., Coopersville, Mich.*

Circle 415 on inquiry card

KITCHEN CATALOG / Colored illustrations of a representative selection of kitchens featuring the company's wide selection of cabinets are the outstanding feature of a new publication "Cabinetmaker Kitchens." The booklet also contains information on the history of cabinet-making. Four pages are devoted to detailed illustrations of special storage features of the various units. The booklet is available, price \$1.00 from ■ Mutschler Brothers Company, Napanee, Ind.

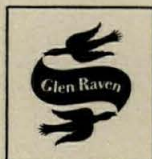
Circle 416 on inquiry card

PANELBOARDS / A bulletin describing recent developments in NLAB and NPAB class lighting and power panelboards to meet the increased power rating demands of commercial and industrial buildings is now available. The 8-page bulletin discusses in detail the new 400- and 600-ampere panelboards, as well as smaller rated 100- and 225-ampere panels. Selection charts, specification data and photographs give a comprehensive picture of the installation and performance of NLAB and NPAB panels. ■ I-T-E Circuit Breaker Company, Philadelphia, Pa. Circle 417 on inquiry card

Forget upkeep twenty stories up!



Sunbrella's® guaranteed five years. It's the architect's asset that lets you design a practical parabola . . . a carefree cabana, and forget all the regular outdoor fabric worries. Forget mildew. Forget rotting, fading, shrinking. Sunbrella's 25 colors and patterns are guaranteed five years, because it's 100% Acrilan* acrylic fiber. Color lasts. Strength stays. Sunbrella stays up safely year-round. The soft non-glare finish has the same color underneath. For free new 1965 design idea booklet write: Glen Raven Mills, Inc., Glen Raven, North Carolina.



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Circle 418 on inquiry card

LIGHTING PANELS / A new 8½-in. by 11-in. luminous panel selector card contains samples of a dozen of the company's lighting panels, for suspended ceilings, ranging from regular or gem-faced prismatics to white and colored clear and frosted acrylics. Each sample is identified by its lighting characteristics and percentage of light transmission. An 8-page brochure on wall-to-wall suspended, luminous and acoustical ceilings is also available. ■ Artcrest Products Company, Inc., Chicago, Ill.

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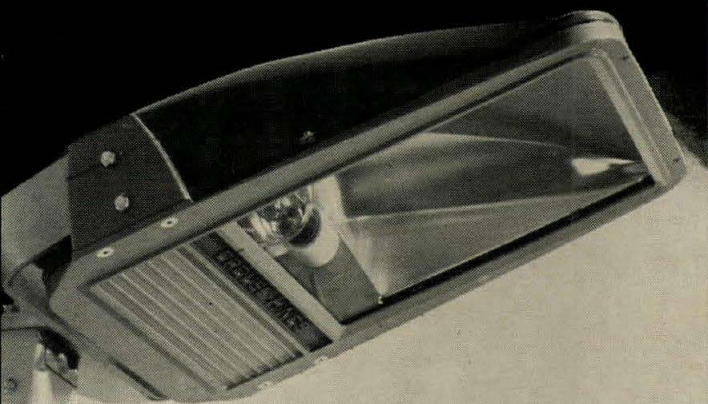
STORAGE WALL ON WHEELS / The *Caravan* mobile storage wall, which can be used as a ceiling-high room divider or stood against the wall and moved to different positions as desired, is described in an illustrated brochure. The mobile unit, which contains a drop-down table and a variety of drawers and shelves, can be used in a number of different situations. Other storage units in different kinds of wood are also displayed in the catalog. A pocket-sized two-color booklet inserted in the brochure gives installation details. ■ Western Wood Products Association, Portland, Ore.

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*Additional product information in Sweet's Architectural File

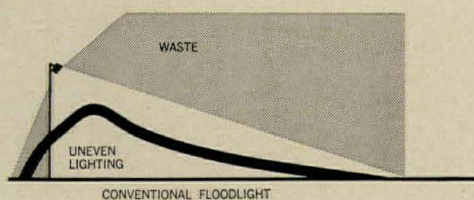
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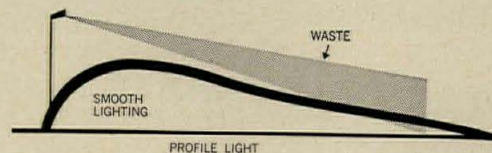
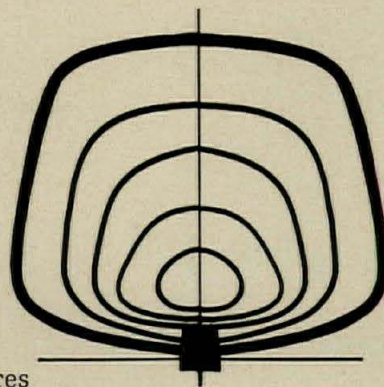
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992, 993, 994, 995, 996, 997, 998, 999, 1000</p>	<p>F M</p> <p>PERMALITE ADHESIVE BUILDING PRODUCTS DEPT. 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continued from page 104

president, **Almon J. Durkee, A.I.A.**, vice president and treasurer and **Harold F. Van Dine, A.I.A.**, secretary.

Olin Schneider has joined **Herman Blum Consulting Engineers**, Dallas, as a mechanical design engineer.

Caudill Rowlett Scott, architects of Houston and New York, have appointed **James Falick, A.I.A.** as associate in charge of health facilities.

Colvin, Hammill and Walter, Architects have an office at 410 The O'Hanlon Building, The Courthouse Square, Wins-

ton-Salem, N. C.

Deeter-Ritche-Sippel Architects is the new name for the Pittsburgh firm formerly Deeter & Ritche Architects.

Robert J. Lindahl has joined **The Engineers Collaborative, Ltd.**, consulting engineers of Chicago, Rockford, Ill. and St. Louis, as comptroller.

Legrand A. Benefiel has joined **Hellmuth, Obata & Kassabaum**, St. Louis architects, as associate director of medical facilities planning.

Hoag - Wismar - Henderson - Associates, Architects-Engineers is the new

name for the Cleveland firm formerly Hargett-Hoag Associates.

Austin Cribben, Jr. has become a member of the Boston architectural firm of **Hoyle, Doran and Berry**.

Richard A. Brehmer, A.I.A. has joined **I.N.E. Corporation**, architects and engineers of Detroit, as chief architect.

Herbert H. Johnson Associates, architects of Miami, Washington and Tampa, have announced that **Mark Hampton** has become a partner and will direct the Tampa office.

James Maguire has joined the Cleveland architectural firm of **Arthur Lawrence Associates**.

James M. Luckman has been elected to the Board of Directors of **Charles Luckman Associates**, architects of New York and Los Angeles.

G. John Stevens, R.A.I.C. has joined **Eberle M. Smith Associates, Inc., Architects and Engineers**.

Charles D. Wiley has joined the San Francisco architectural firm of **Neil Smith and Associates**.

Robert W. Yokom, A.I.A. is an associate in **Smith, Hinchman and Grylls Associates, Inc.**, Detroit architectural, engineering and planning firm.

Smith & Smith/Associates, architects of Royal Oak, Mich., have named **William M. Yeager** director of construction administration and **Bradley R. Storer, A.I.A.**, director of architecture.

Stone, Marraccini and Patterson, architects of San Francisco, have elected **George Crowe, Clark A. Davis, Warren C. Wachs** and **Erni Young** associates.

John Carl Warnecke and Associates, architects and planning consultants, San Francisco, have appointed **Harold L. Adams, Donald Schaefer, John Bruce Webb** and **Wayburn Yuen** associates. In the Washington office, **Charles Edward Diehl** has become manager and director of firm management planning.

Whittlesey and Conklin, architects and city planners of New York City, have announced that **James Stephan Rossant** has become a partner and consequently the firm will be known as **Whittlesey Conklin & Rossant**. **Herbert Leonard Mandel** has become an associate in the firm.

NEW ADDRESSES

Caldwell & Bedikian, Architects, 960 Oil & Gas Building, New Orleans 70112.

David W. Evans & Associates, Century Tower Building, Suite 215, 1201 S.W. 12th Ave., Portland.

Vincent G. Kling and Associates, architects, 1401 Arch Street, Philadelphia

New
Apartment House Intercom

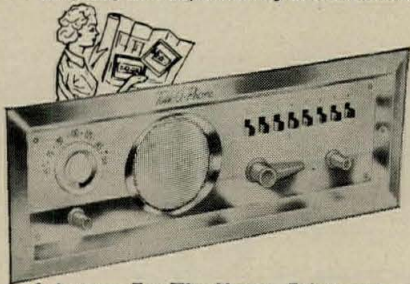
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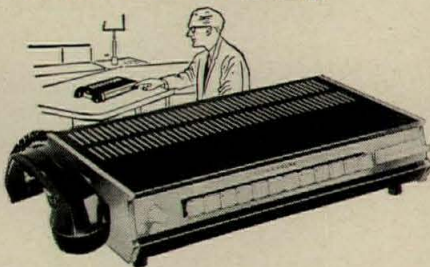
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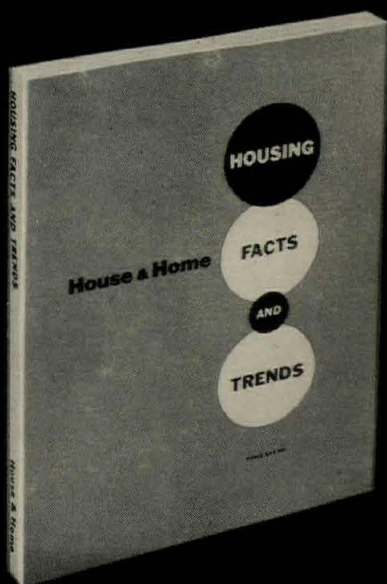
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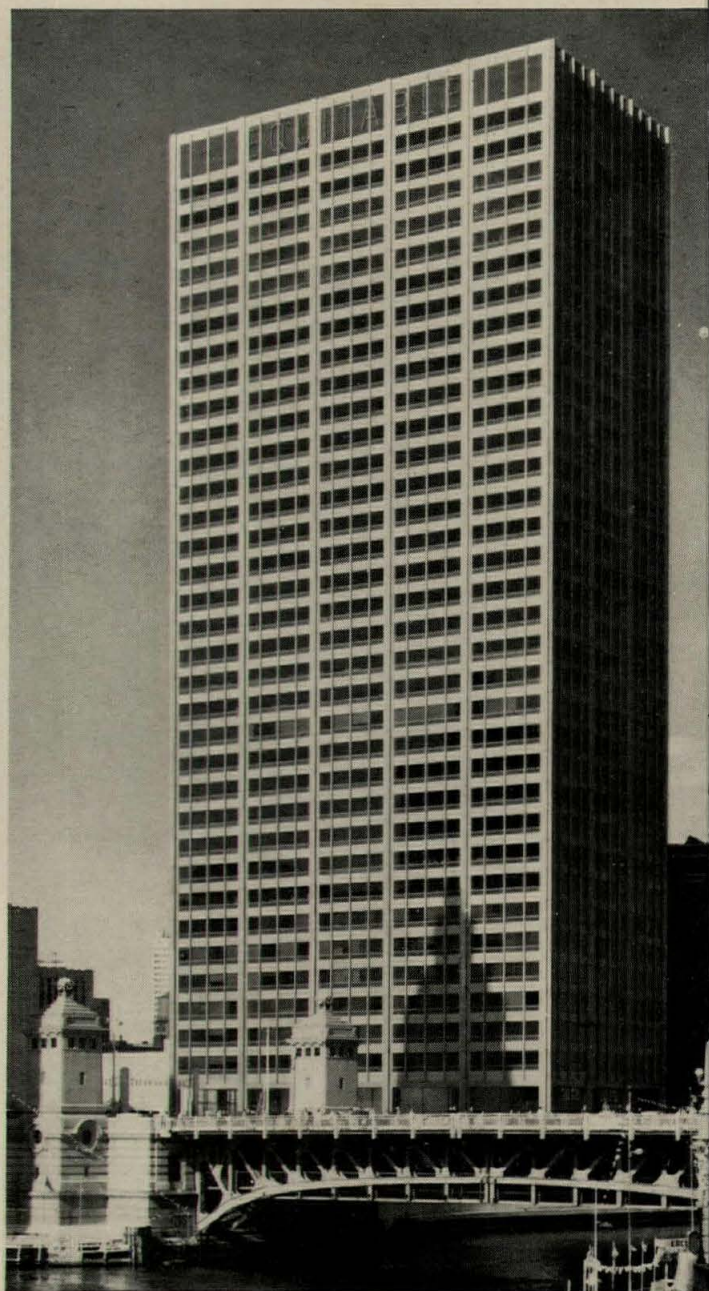
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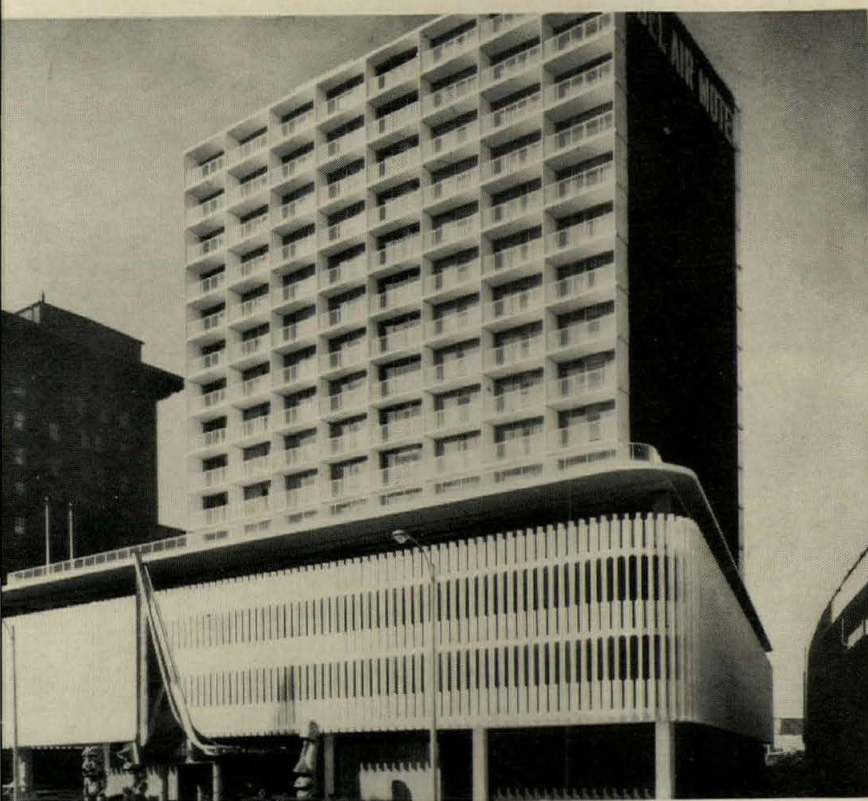
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Oregon dormitory looks inward on courtyard

Bean Hall dormitory at the University of Oregon in Eugene faces inward on a courtyard with the lounges, recreation and dining areas surrounding the commons area at floor level. Of primary importance to the University was that housing should be subdivided into living groups of not more than 80 students with two counselors per group, and a total population of 720 students. This was accomplished by architects Wilmsen Endicott & Unthank by providing complete and separate dining and lounge facilities for each group, with facilities designed for use by either sex. All eight separate dining areas directly adjoin a single large kitchen.



Individual study rooms are limited to an area of 150 square feet for two students.

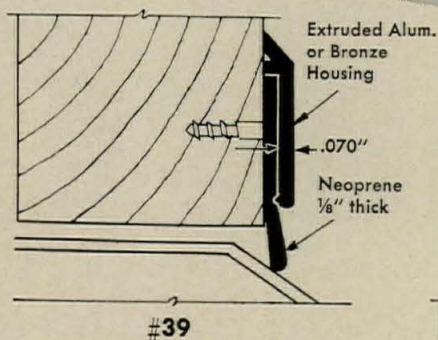
Construction of the dormitory was of reinforced concrete and masonry, with the exterior being a combination of brick, masonry, precast concrete panels and glass.

The building was constructed in two phases, with 360 units per phase. In addition to the four units of 80 students in each phase is a special unit of 40 students to accommodate a more flexible use such as for graduate students. The total project contains 146,600 square feet and was constructed at a cost of about \$17 per square foot, excluding furnishings, fees and land.

Tom Burns, Jr. Photos

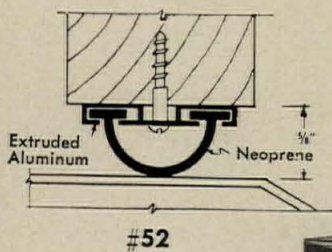
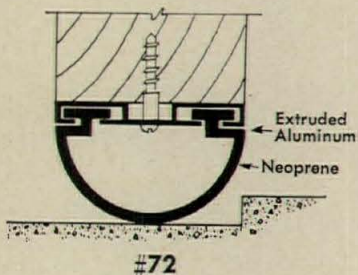


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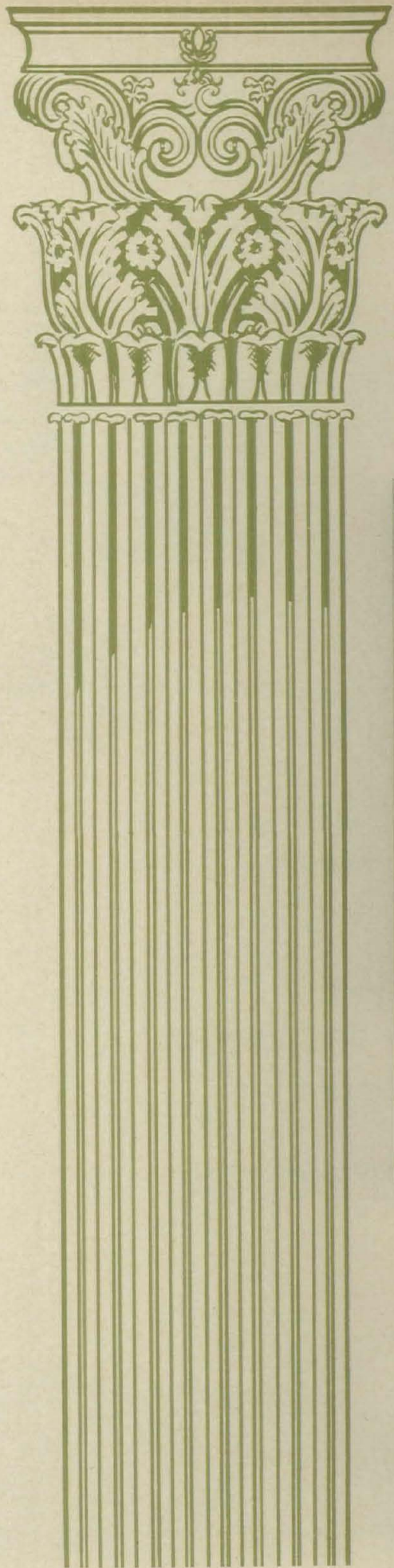
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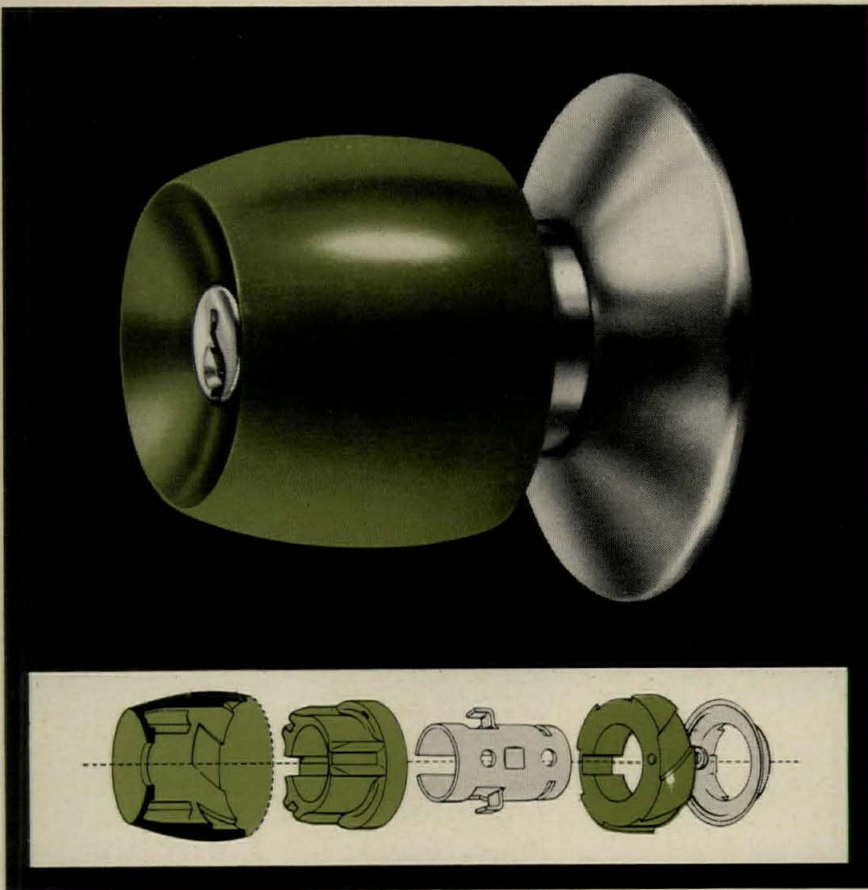




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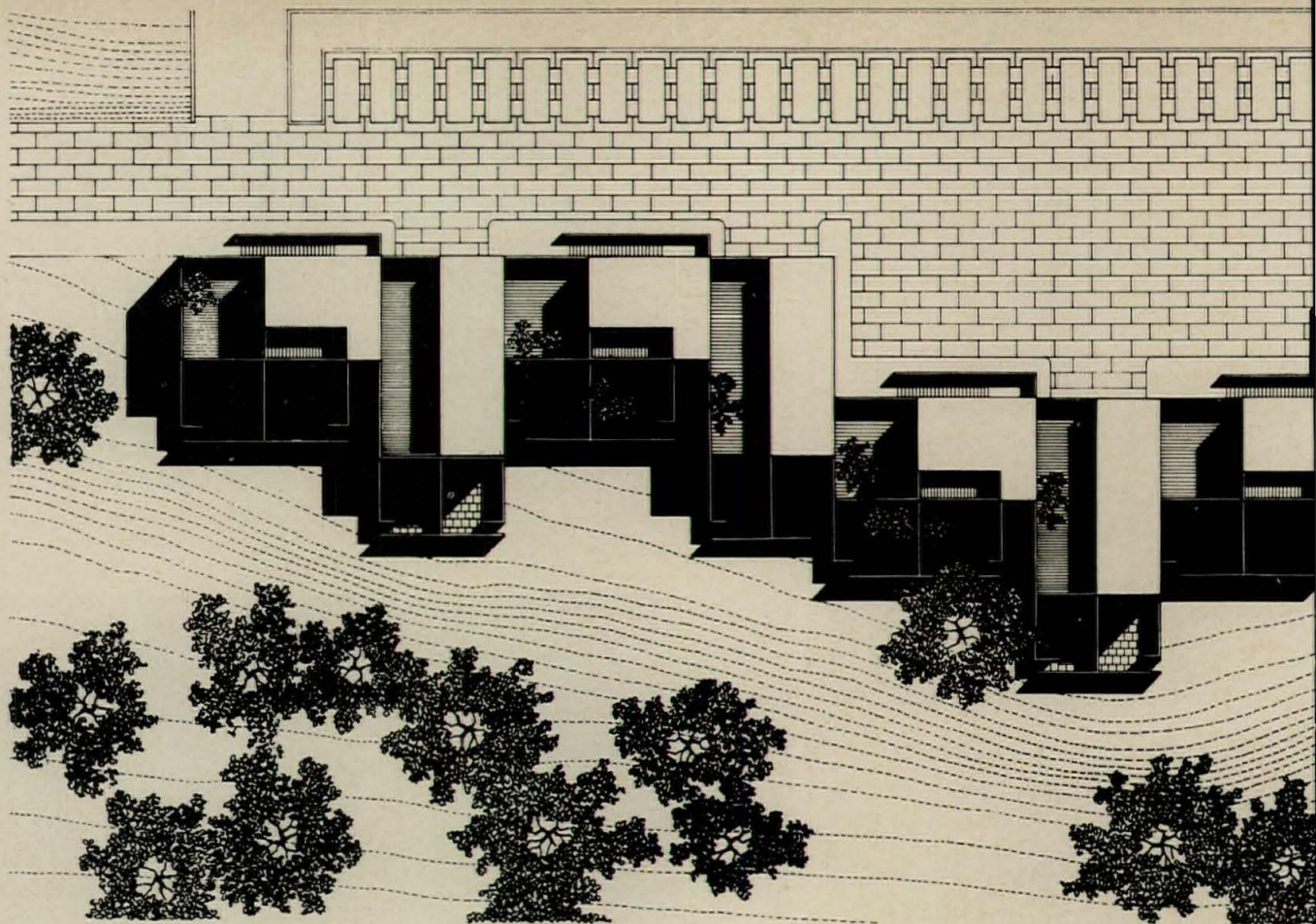


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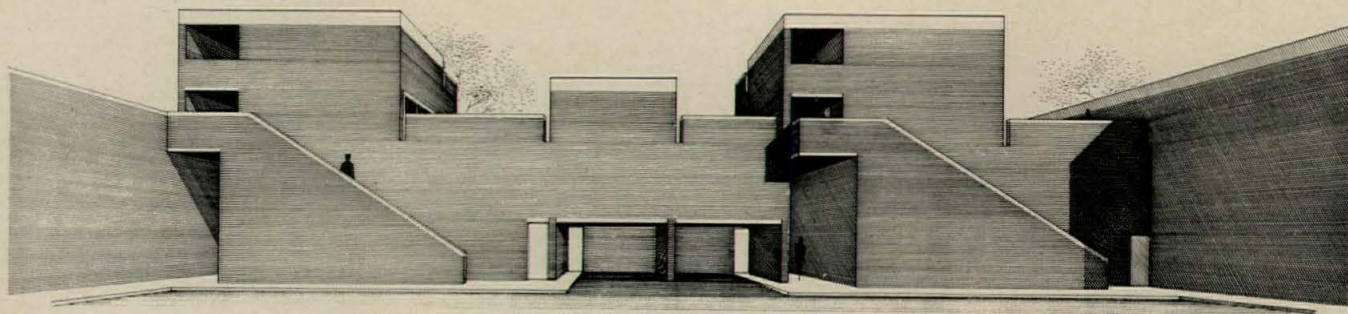
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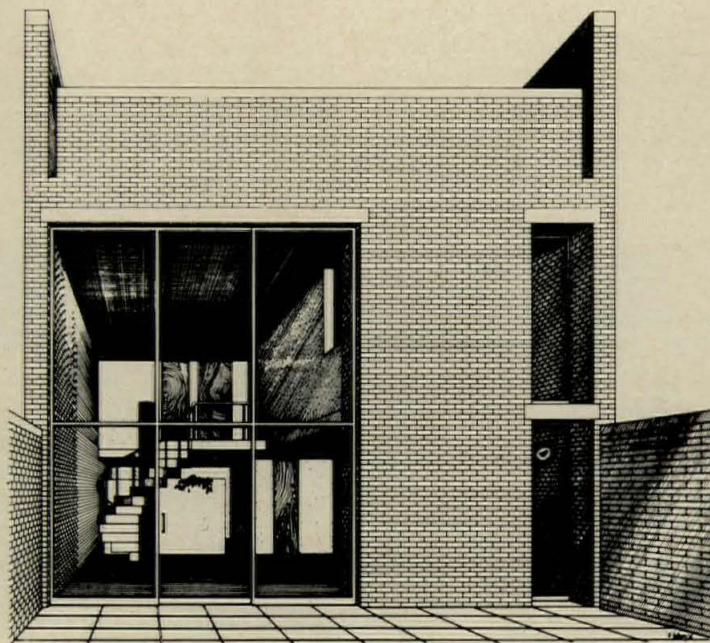
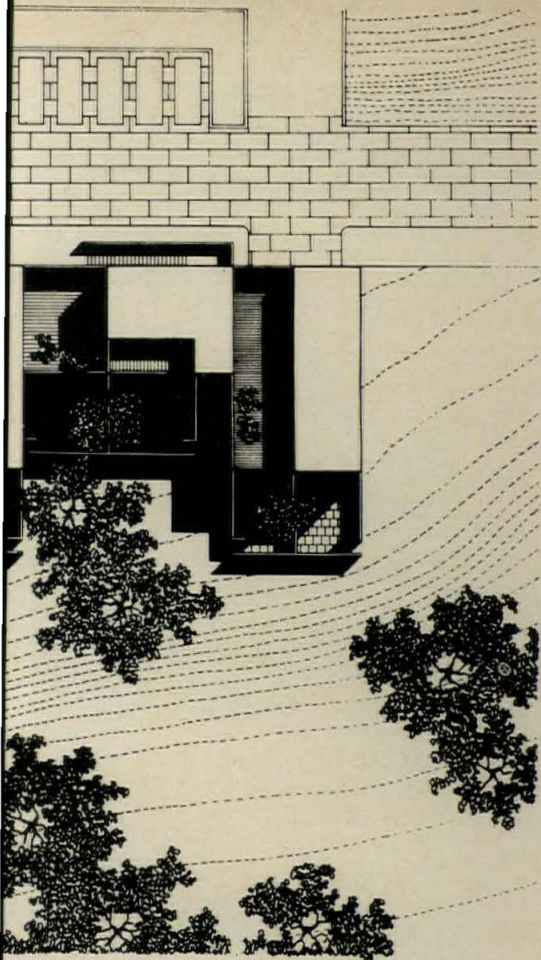
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Marvin Hatami designs an apartment house

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





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.

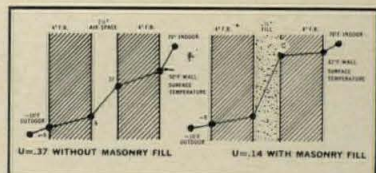
Masonry Fill also reduces initial building costs because smaller, more efficient heating units can be

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 DIVISION W. R. GRACE & CO.
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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.

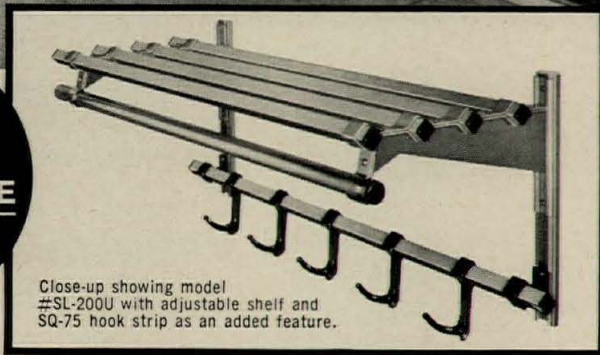
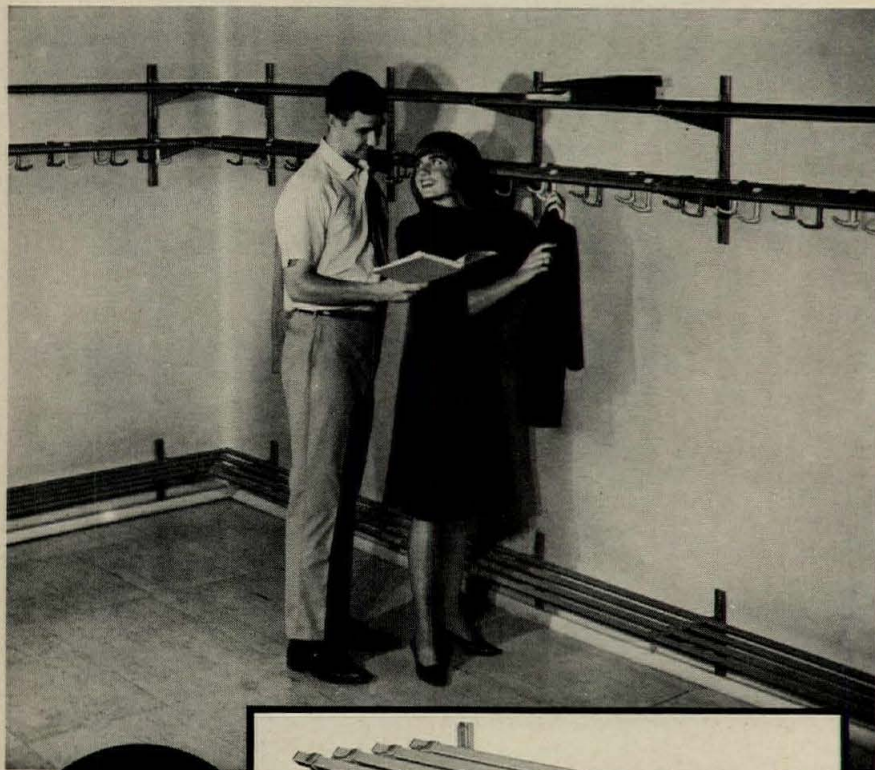
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Architectural League honors 24 in Gold Medal Competition

Gold Medal winners in the 63rd National Gold Medal Competition of the Building Arts of the Architectural League of New York (except for three published in November, page 35) are shown on this page. The Gold Medal juries, a jury for each of the six categories, and another for the Collaborative Medal of

Honor, after considering more than 70 entries, voted 24 awards in the 1965 competition: the Collaborative Medal of Honor, four gold medals, six silver medals, nine honorable mentions and four citations.

Following is a list of the remaining winners:



Close-up showing model #SL-200U with adjustable shelf and SQ-75 hook strip as an added feature.

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For complete information and specifications, write for Catalog SL-52

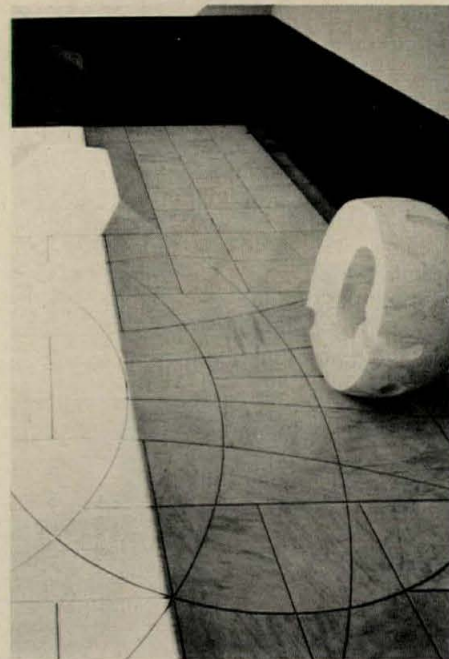
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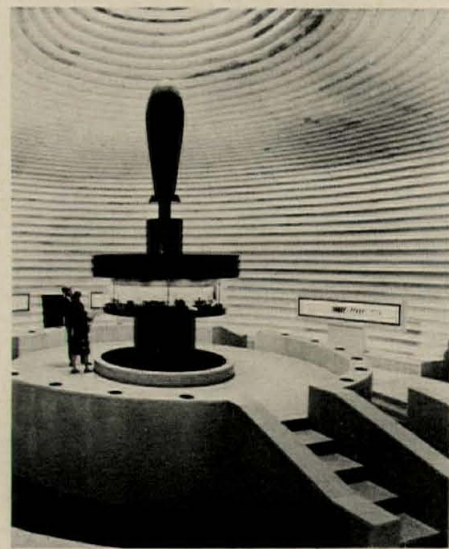
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GOLD MEDAL FOR SCULPTURE: to Isamu Noguchi for Beinecke Rare Book and Manuscript Library, Yale University, New Haven. Architects: Skidmore, Owings & Merrill.



GOLD MEDAL FOR DESIGN AND CRAFTSMANSHIP: to Frederick Kiesler and Armand Bartos, architects for the Shrine of the Book, The D. S. and R. H. Gottesman Center for Rare Manuscripts, Jerusalem, Israel.

CITED FOR COLLABORATION: New York State Pavilion, World's Fair, New York. Architect: Philip Johnson; structural engineers: Lev Zetlin & Associates; mechanical engineers: Syska & Hennessy; landscape architects: Zion & Breen Associates; sculptors: Peter Agostini, John Chamberlain, Alexander Liberman, and Robert Mallary; and muralists: Robert Indiana, Ellsworth Kelly, Roy Lichtenstein, Robert Rauschenberg, James Rosenquist, and Andy Warhol.

CITED FOR COLLABORATION: New York State Theater, Lincoln Center for the Performing Arts, New York. Architect: Philip Johnson;

continued on page 277

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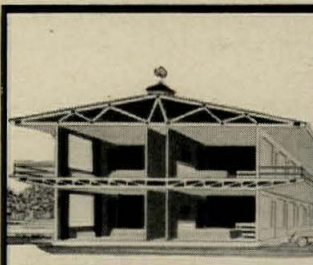
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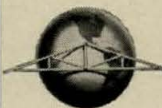
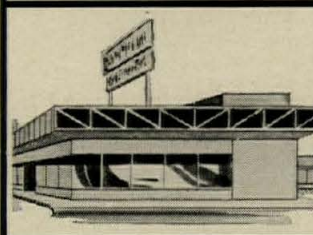
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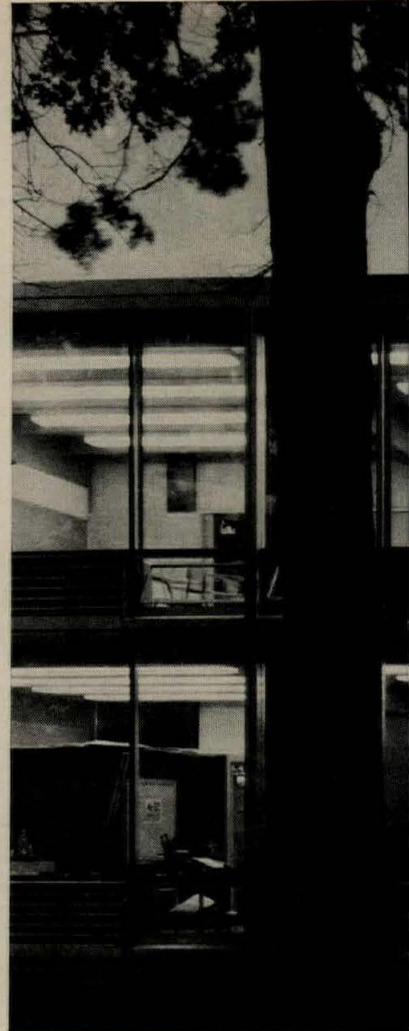
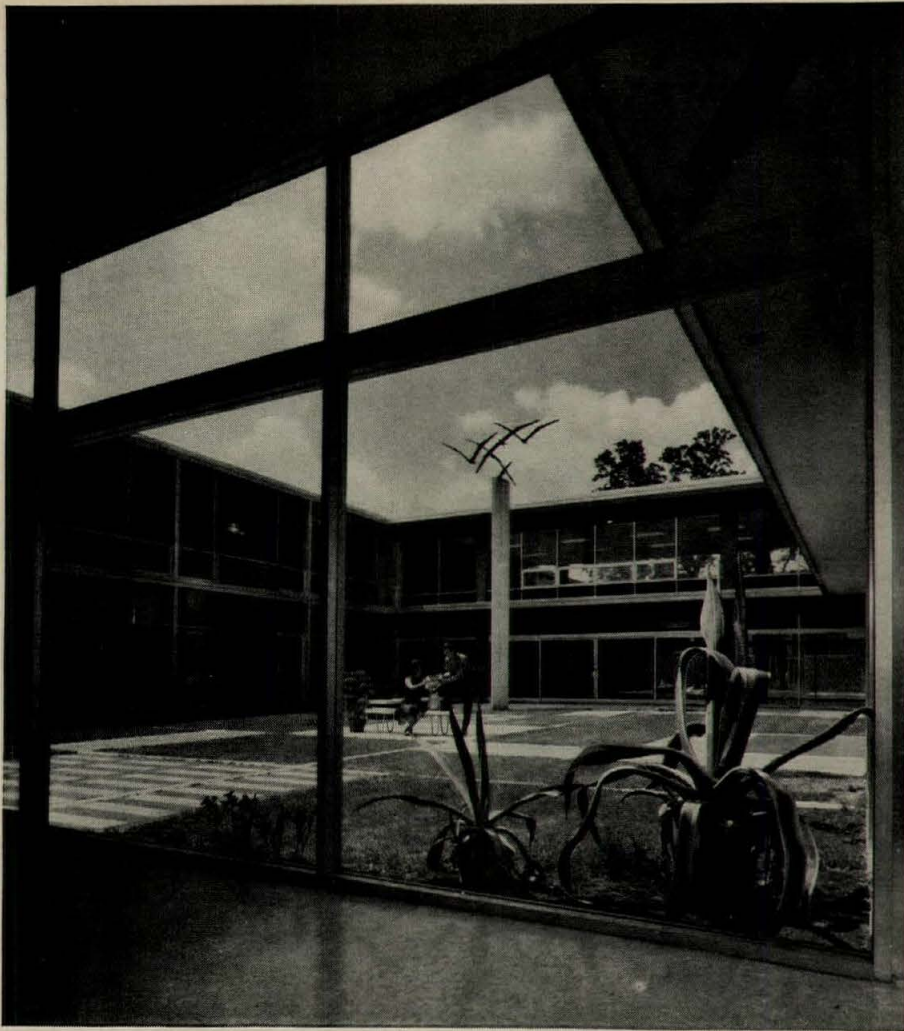
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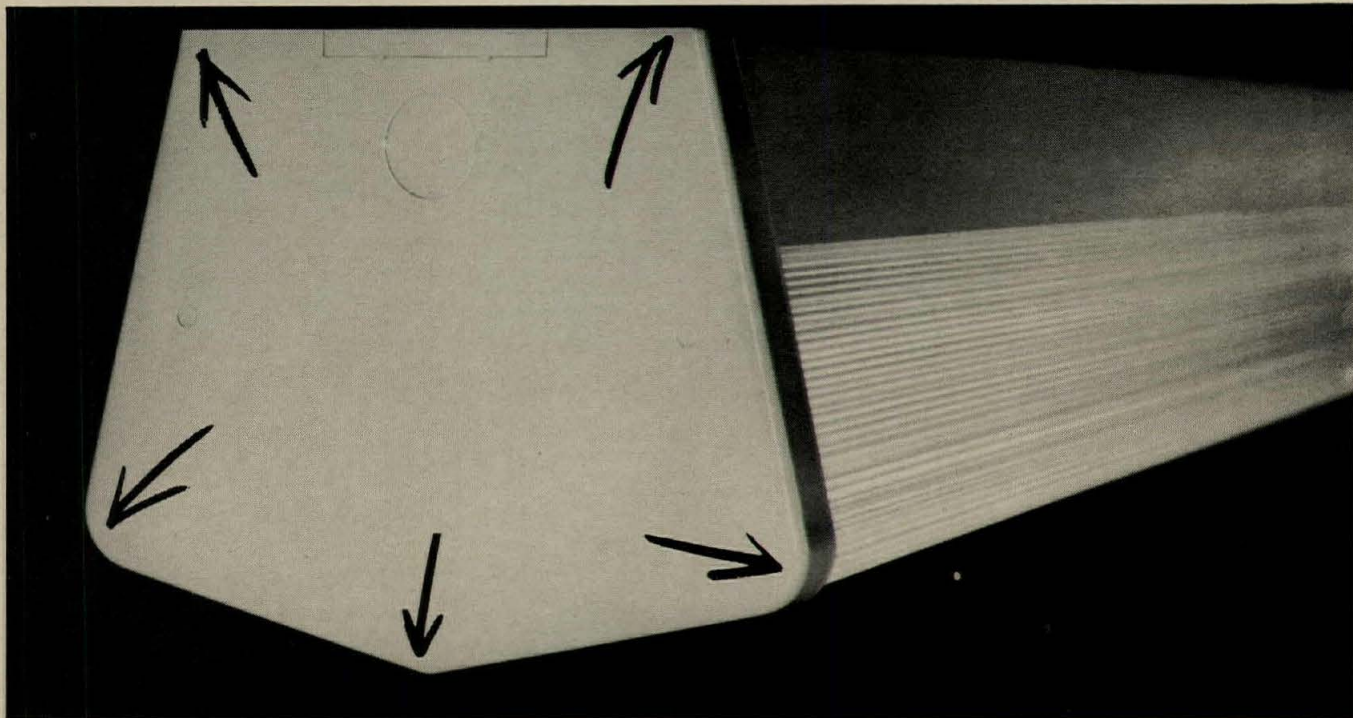


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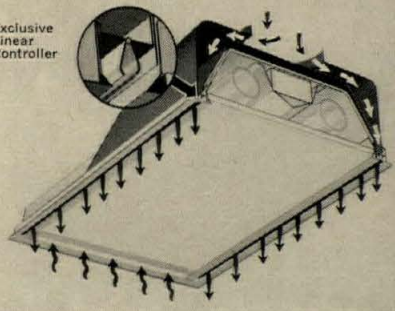
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THE RECORD REPORTS

GOLD MEDAL COMPETITION

continued from page 272

structural engineers: Severud-Perrone-Fischer-Sturm-Conlin-Bandel; mechanical engineers: Syska & Hennessy; acoustical engineer: Vilhelm Jordan; lighting consultant: Richard Kelly; and sculptors: Lee Bontecou, Edward Higgins, Jasper Johns, Jacques Lipchitz; Elie Nadelman, Ruben Nakian and Francesco Somaini.

CITED FOR COLLABORATION: School of Art and Architecture, Yale University, New Haven. Architect: Paul Rudolph; structural engineer: Henry A. Pfisterer; mechanical engineers: Van Zelm, Heywood & Shadford; sculptors: Josef Albers and Robert Engman; and muralist: Sewall Sillman.

SILVER MEDALS FOR ARCHITECTURE: Eero Saarinen & Associates, architects, for Deere & Company, Moline, Illinois; and Bertrand Goldberg Associates, architects, for Marina City, Chicago. Honorable mention went to Venturi & Short, architects, for Venturi House, Chestnut Hill, Pennsylvania.

SILVER MEDALS FOR ENGINEERING: Walter W. Bird, structural engineer and Severud-Elstad-Krueger, structural engineers for Air Supported Structure for the United States Atomic Energy Commission Traveling Exhibit, Victor A. Lundy, architect; and Paul Weidlinger, structural engineer, for the St. Louis Priory Church, St. Louis. Honorable mentions went to Ammann & Whitney for the United States Embassy, Dublin, Ireland, and to Strobel and Rongved, structural engineers, for The Shrine of the Book, Jerusalem, Israel.

SILVER MEDAL FOR SCULPTURE: to Constantino Nivola for Stiles and Morse Colleges, Yale University, New Haven. Honorable mentions went to Harris Barron for Parkside Elementary School in Columbus, Indiana, and to Isamu Noguchi for John Hancock Mutual Life Insurance Company, New Orleans.

SILVER MEDAL FOR DESIGN AND CRAFTSMANSHIP: to Skidmore, Owings & Merrill, architects, for the Protestant Chapel, United States Air Force Academy, Colorado Springs, Colorado. Honorable mentions went to Benjamin Baldwin, interior designer for "House in Midwest"; to Charles Eames, furniture designer, for Tandem Seating, Venice, California; and to Skidmore, Owings & Merrill, interior designers, and Ward Bennett, furniture consultant, for Chase Manhattan Bank, New York City.

Honorable mention in Mural Painting went to Max Spivak for Warner Lambert Pharmaceutical Research Center, Morris Plains, New Jersey.

CITATION FOR LANDSCAPE ARCHITECTURE to Edward Larrabee Barnes, architect "for his sensitive consideration of the site in the design of the Haystack Mountain School of Arts and Crafts, Deer Isle, Maine."

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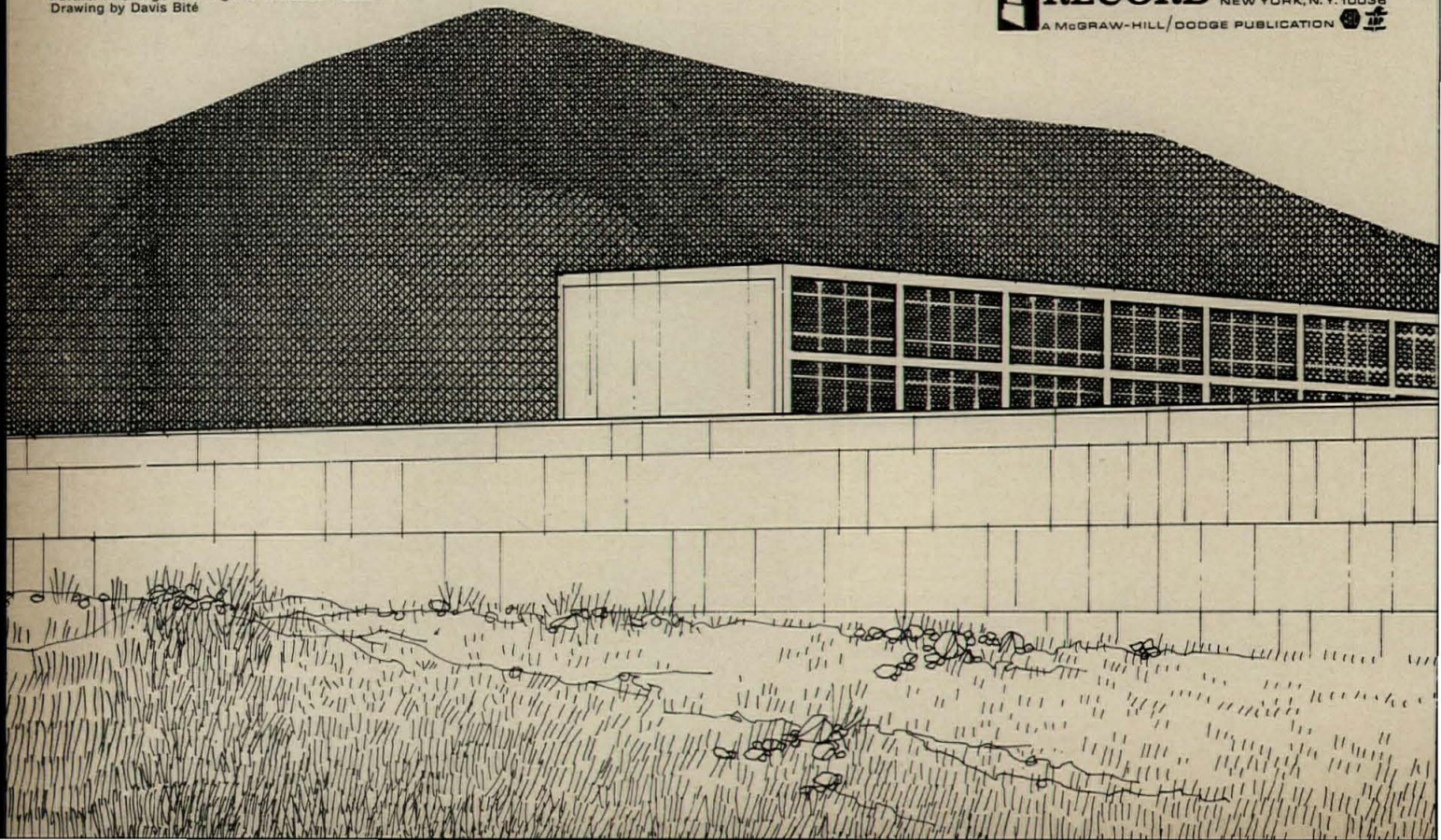


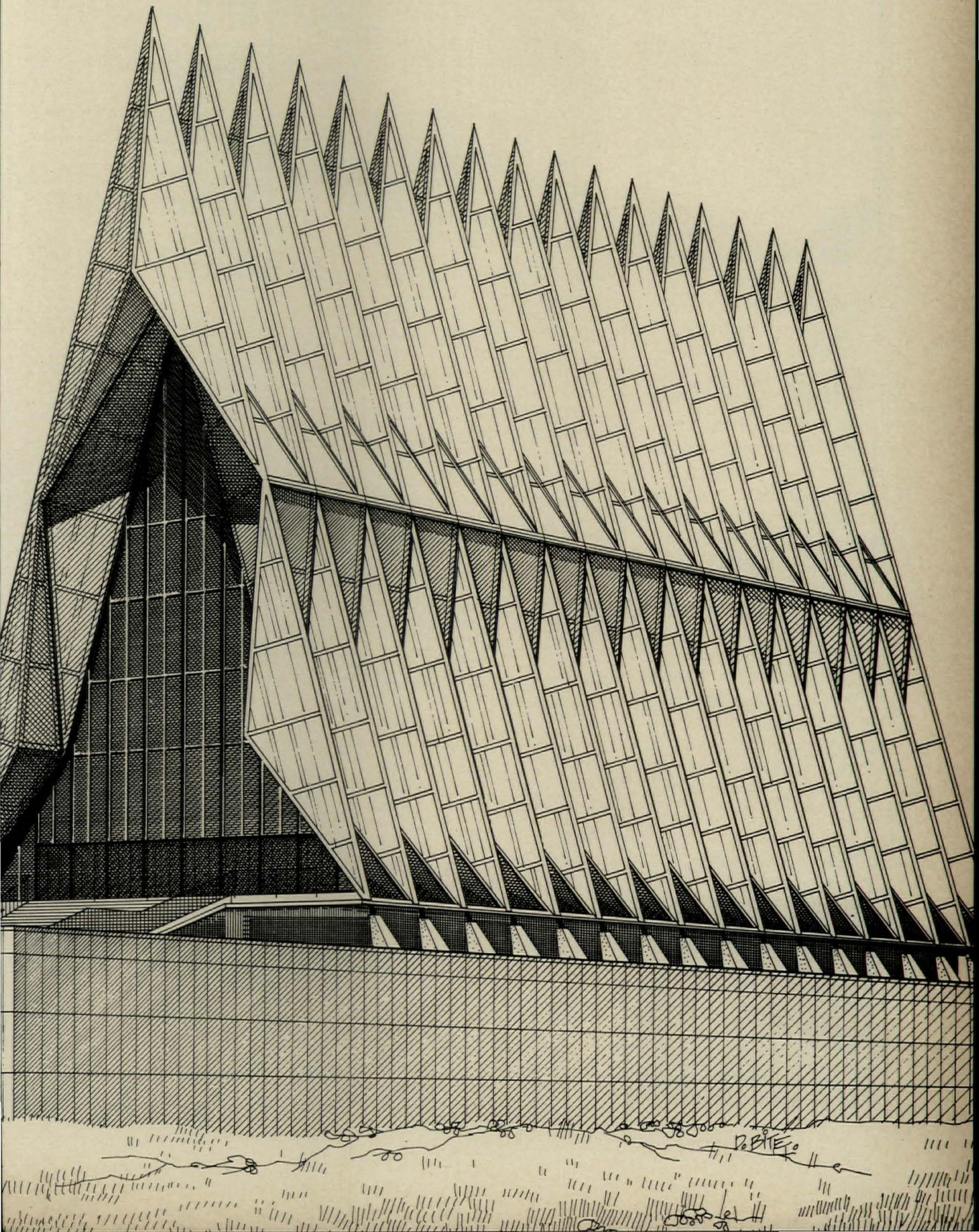
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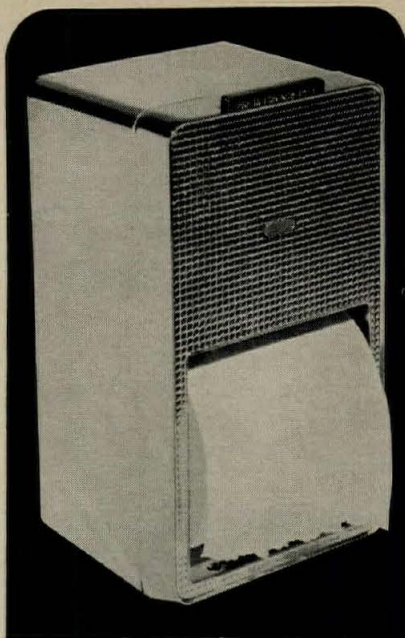
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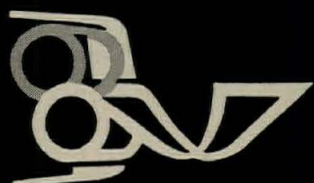


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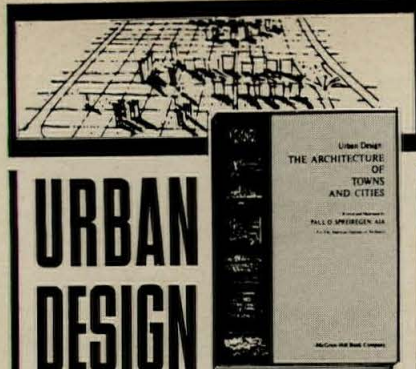
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BASE METALS

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United States Metals Refining Company
Heath Steele Mines Ltd. (75% owned)
Amax Iron Ore Corporation
Ponce Mining Company, Inc. (85% owned)

FERROALLOYS & REACTIVE METALS

Climax Molybdenum Company
Climax Uranium Company
Carborundum Metals Climax Company (50% owned)

OIL & CHEMICALS

Southwest Potash Corporation
Amax Petroleum Corporation

EXPLORATION & MINING INVESTMENTS

Amax Exploration, Inc.
Roan Selection Trust Ltd. (46% equity)
Tsumeb Corporation Ltd. (29% equity)
O'okiep Copper Company Ltd. (20% equity)
Copper Range Company (17% equity)
Minera Frisco (18% equity) and Others

AMAX

AMERICAN METAL CLIMAX, INC.
Rockefeller Center, New York, N.Y. 10020

ADVERTISING INDEX

Pre-filed catalogs of the manufacturers listed below are available in the 1966 Sweet's Catalog File as follows.

- A Architectural File (green)
- I Industrial Construction File (blue)
- L Light Construction File (yellow)

A	
A-I AA Wire Products Co.	186
Aerofin Corp.	82
Air Devices, Inc.	207
A Allen Mfg. Co., W. D.	95
A-I Altec Lansing Corp.	196
A-I Aluminum Co. of America.	216-217
A-L Amarlite Div., Anaconda Aluminum Co. ..	225
A-I Amerada Glass Corp.	241-242
I American Air Filter Co., Inc.	254-255
American Metal Climax, Inc.	281
A-I-L American Plywood Association	80-81
A-I American Telephone & Telegraph Co. ..	34
Ames Co., W. R.	32-6
A-L Andersen Corp.	65 to 68
Architectural Record	278-279
A-I-L Armstrong Cork Co.	2nd Cover, 1, 62-63
A Art Metal, Inc.	64

B	
A Bally Case & Cooler, Inc.	226-227
Basalt Rock Co., Inc.	32-13
A Bayley Co., William	195
A-I Bell Telephone System	34
Benjamin Div., Thomas Industries, Inc.	208-209
A-I Bethlehem Steel Corp.	24, 30-31, 253
A-I Borden Metal Products Co.	45
A-I Bradley Washfountain Co.	75

C	
A-L Cabot, Inc., Samuel	218
A-I-L Carrier Air Conditioning Co.	21
A Ceco Corp.	210
Chemstrand Co.	249 to 252
A-I Climate Control Div., Singer Co.	86
A Connor Lumber & Land Co.	98
A-I Cordley & Hayes	94
Crouse-Hinds Co.	261

D	
Dahlstrom Mfg. Corp.	70
Day-Brite, Div. of Emerson Electric Co. ..	101
Dodge Reports	32-14-15
A Dover Corp., Elevator Division	2-3
A-I-L Dur-O-Wal, Inc.	257

E	
A Eastern Products Corp.	3rd Cover
Electric Heating Association, Inc.	213-214
A-L Engineered Products Co.	212

F	
Fabri-Form Co.	70
A Flexicore Co., Inc.	244
A FMC Corp., Inorganic Chemicals Div. ..	48
A-I-L Frantz Mfg. Co.	284

G	
A-I-L General Electric Co.	49 to 60, 201
A-I-L Georgia Pacific Corp.	223-224
Glen Raven Cotton Mills, Inc.	260
A Glidden Co.	22-23
A Global Steel Products Corp.	70
Goodyear Tire & Rubber Co.	83
A-I Great Lakes Carbon Corp.	262-263
Greenberg's Sons, M.	32-6
A Gulistan Carpet, Div. J. P. Stevens & Co., Inc.	12

H	
A Haughton Elevator Co.	186
A Haws Drinking Faucet Co.	202
A-L Home Comfort Products Co.	104
A-I Hooker Chemical Co., Durez Plastics Div.	88

I	
In Sink Erator Mfg. Co.	240
International Harvester Co.	47

J	
A Jamison Cold Storage Door Co.	96
A-I Josam Mfg. Co.	188
Josam Pacific Co.	32-6

K	
Kaiser Cement & Gypsum Corp.	32-7
A Kawneer Co.	198-199
A-I-L Kentile, Inc.	7
A-I Kinnear Mfg. Co.	79
A Krueger Metal Products Co.	94
K-S-H Plastics, Inc.	91

L	
A LCN Closers, Inc.	72-73
Lehigh Portland Cement Co.	28
A Levolor Lorentzen, Inc.	61
A-I-L Libbey-Owens-Ford Glass Co.	274-275
Limestone Products Corp. of America.	84
Lockwood Hardware Div., Independent Lock Co.	269
Lone Star Cement Corp.	106
A Ludowici-Celadon Co.	32
A Luminous Ceilings, Inc.	194

M	
A-I Mahon Co., R. C.	220
A Market Forge Co.	277
A-L Marsh Wall Products Div., Masonite Corp.	243
McGraw-Hill Book Co.	280
A Mercer Plastics Co., Inc.	193
A Michaels Art Bronze Co.	212
Miller Co.	105
A-I-L Mississippi Glass Co.	89-90
Mobay Chemical Co.	99-100
I Modine Mfg. Co.	238-239
Morgan Co.	71
A-I Mosaic Tile Co.	211

N	
A National Plastic Prods. Co., Inc., Nevamar Co. Div.	25
Northern California Electric Bureau	32-12
A Northrop Architectural Systems	229

O	
A Otis Elevator Co.	26
A-I Overhead Door Corp.	185

P	
Prescon Corp.	74
A-I Prestressed Concrete Institute	69
Price Pfister Brass Mfg. Co.	13
A-I Products Research Co.	232

R	
A Republic Steel Corp.	234-235
A Reserv-A-Roll Co.	280
A Robbins Flooring Co.	215
Robertshaw Controls Co.	97
A Rohm & Haas Co.	85
A-L Rolscreen Co.	16A-16B, 17 to 20
Rotolite Sales Corp.	273
A Rowe Mfg. Co.	237

S	
A St. Charles Mfg. Co.	76
Sanford Truss, Inc.	273
A Sanymetal Products Co., Inc.	87
A Sargent & Co.	230-231
Schemenauer Mfg. Co.	77
A-I-L Sisalkrait Div., St. Regis Paper Co.	102-103
A-I Sloan Valve Co.	4th Cover
Southern California Edison Co.	32-8
So. California & So. Counties Gas Cos.	32-16
Square D Co.	187
Stagecraft Corp.	16
A-I Standard Conveyor Co.	218
A Steel Deck Institute	228
A Steel Joist Institute	197
A-I Stromberg-Carlson Corp.	200
A Summitville Tiles, Inc.	219
Sweet's Catalog Service	283
A-I Sylvania Electric Products, Inc.	276-277
A-I-L Symons Mfg. Co.	98

T	
Talk-A-Phone Co.	264
A-I Taylor Co., Halsey W.	233
A Temco, Inc.	33
A-I-L 3M Co.	236
Trinity White, General Portland Cement Co.	8
Tuttle & Bailey	221-222

U	
A-I United States Gypsum Co.	14-15
A-L United States Plywood Corp.	203 to 206
I United States Steel Corp.	92-93
A-I Upco Co.	256

V	
A Vectra Co., Div. of National Plastic Products	245-246
A Vogel-Peterson Co.	272

Index to buying information

W

W & F Mfg., Inc.	186
Wakefield Corp.	29
Waterloo Register Co.	27
A-I-L Western Wood Products Assn.	258-259
A-I Wheeling Corrugating Co.	37 to 39

Y

A-I Yale & Towne	11
A-I-L York Corp.	266-267

Z

A-I Zero Weather Stripping Co., Inc.	268
A-L Zonolite Division	270-271

A



ARCHITECTURAL CATALOG FILE

I



INDUSTRIAL CONSTRUCTION CATALOG FILE

L



LIGHT CONSTRUCTION CATALOG FILE

These symbols are used in the facing index to tell you which advertisers make their catalogs instantly accessible in Sweet's Construction Catalog Files.



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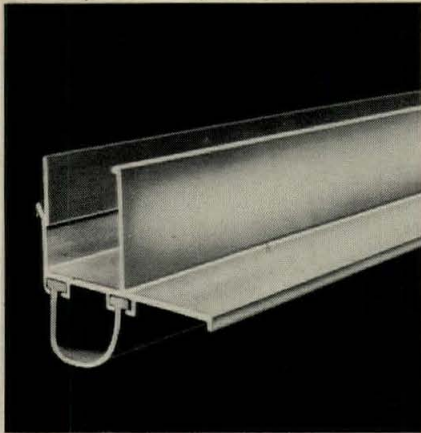
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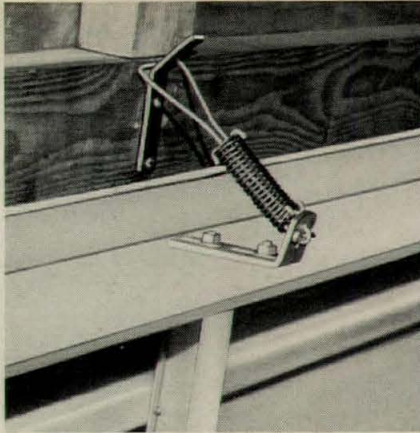
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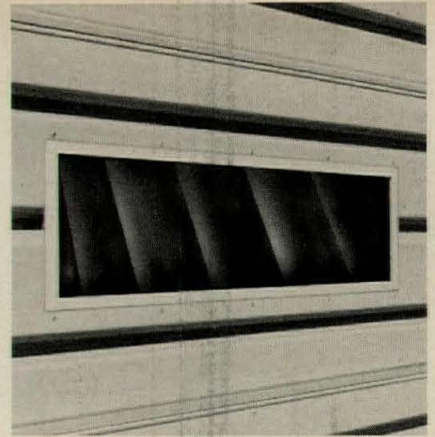
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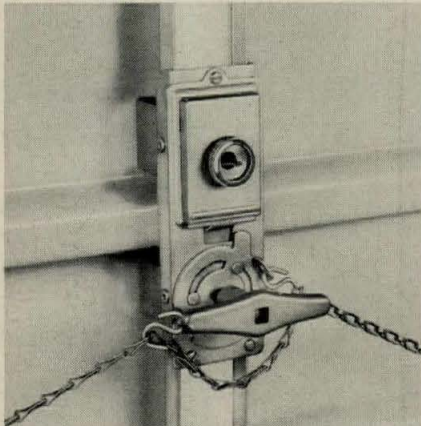
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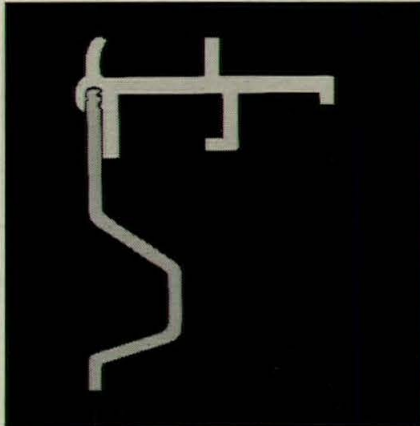
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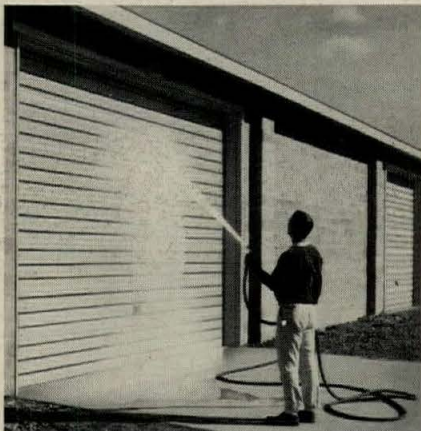
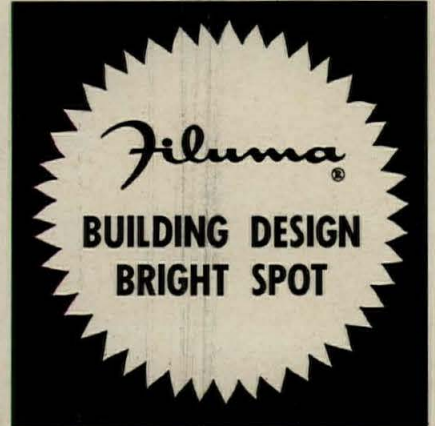
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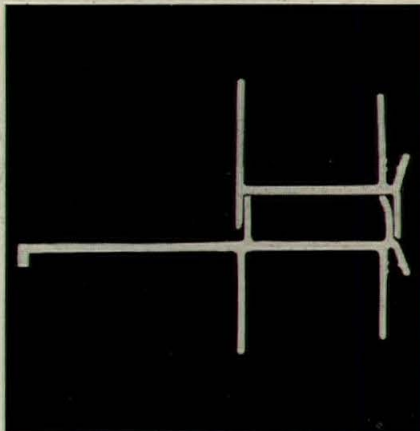
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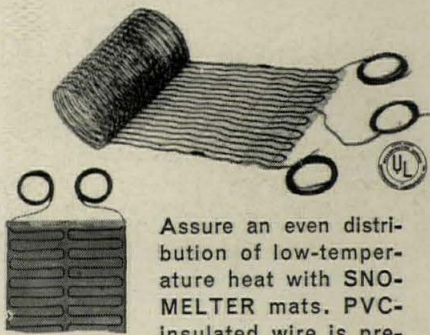


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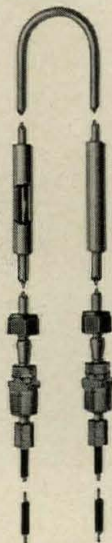
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For more data, circle 189 on inquiry card

U

- A-I United States Gypsum Co.234-235
- A-L United States Plywood Corp.227-228
- A United States Steel Corp. (subs)116, 311
- A Universal Atlas Cement116, 311
- A-I Upco Co. 112
- A-L Uvalde Rock Asphalt Co.3rd Cover

W

- Wagner Mfg. Co. 295
- A Weis Mfg. Co., Inc., Henry 71
- A-I-L Western Wood Products Assn.254-255
- A-I-L Westinghouse Electric Corp. 2-3
- A-I-L Weyerhaeuser Company59 to 62
- Wheeler Reflector Co., Inc. 278
- A-I Wide-Lite Corp.80, 270
- A-I-L Wiegand Co., Edwin L. 209
- A Wilson Research Corp. 236
- A-L Wood-Mosaic Corp. 260
- A World Dryer Corp. 70

Y

- A-I Yale Div., Eaton Yale & Towne Inc. 65

Z

- A-I Zero Weather Stripping Co., Inc. 256
- A-L Zonolite Division 299

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Index to buying information

A



ARCHITECTURAL CATALOG FILE

I



INDUSTRIAL CONSTRUCTION CATALOG FILE

L



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ADVERTISING INDEX

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- A Architectural File (green)
- I Industrial Construction File (blue)
- L Light Construction File (yellow)

A

A Acme National Refrigeration Co., Inc.	100
Aerofin Corp.	222, 258
A-I Allied Chemical Corp., Barrett Div.	38-39
A-I Aluminum Co. of America	280-281
A-L Amarlite Div., Anaconda	
Aluminum Co.	81 to 84
American Gas Association	33, 124
A American Olean Tile Co.	2nd Cover
A American Standard, Plumbing & Heating Div.	94
A AMETEK, Inc., Troy Laundry Machinery Div.	208
Anaconda American Brass Co.	248
A-I Anchor Post Products, Inc.	303
A-L Andersen Corp.	86-87
Archer Daniels Midland Co.	108B-108C
Architectural Record	308-309
A Arkla Air Conditioning Co.	33
A-L Armco Steel Corp.	78
A-I-L Armstrong Cork Co.	37
A-L Azrock Floor Products Div.	3rd Cover

B

A Bally Case & Cooler, Inc.	28-29
A-I Barrett Div., Allied Chemical Corp.	38-39
A Bayley Co., William	120
Benjamin Div., Thomas Industries, Inc.	56-57
A-I-L Bestwall Gypsum Div., Georgia-Pacific Corp.	31
A-I Bethlehem Steel Corp.	16, 107, 230
Boiler Engineering & Supply Co., Inc.	240
A-I Borden Metal Products Co.	47
A-I Bradley Washfountain Co.	75

C

A Cambridge Tile Mfg. Co.	91
A-I Carey Mfg. Co., Philip	110, 268
A-I Carlisle Tire & Rubber Div., Carlisle Corp.	232
A-I-L Carrier Air Conditioning Co.	45, 124
A Ceco Corp.	266-267
Chicago Faucet Co.	222
Chicago Hardware Foundry Co.	224
Chicago Pump Co.	212
A-I-L Chrysler Corp., Airtemp Div.	229
Cissell Mfg. Co., W. M.	123
Clermont Polychemical Corp.	224
A-I Climate Control Div., Singer Co.	314
Commercial Carpet Corp.	292-293
Concrete Reinforcing Steel Institute	300-301
A Consoweld Corp.	277
A-I Cookson Co.	282
A Co-Polymer Chemicals, Inc.	298
Copper Development Association, Inc.	0

D

Day-Brite Lighting, Div. of Emerson Electric	104-105
A-I-L Devoe & Reynolds Co., Inc., sub. Celanese Corp.	250-251
Dodge Reports	32-18-19
A Dover Corp., Elevator Division	196
A-I-L Dow Chemical Corp.	244
DuKane Corp.	200
A Duriron Co., Inc.	1
A-I Duwe Precast Concrete Prods., Inc.	286

E

Eaton Yale & Towne Inc.	64
A-I Eaton Yale & Towne Inc., Yale Div.	65
Edison Electric Institute	63
Electric Heating Association, Inc.	271-272
Eljer Plumbingware Div., Wallace-Murray Corp.	24
Executone, Inc.	30

F

A-I-L Fedders Corporation	304-305
A Fenestra, Inc.	193, 253
A-I-L Flintkote Co.	215 to 218
A Follansbee Steel Corp.	32

G

A-I-L General Electric Co.	13
A General Fireproofing Co.	12
Glen Raven Cotton Mills, Inc.	32-12
A Glidden Co.	14-15, 76-77
A Global Steel Products Corp.	17
A Glynn-Johnson Corp.	108
A-I Goodrich Co., B. F.	121
Goodyear Tire & Rubber Co.	73
A-I Granco Steel Products Co.	238-239
A-I Great Lakes Carbon Corp.	194-195
A-I Great Lakes Carbon Corp., Perlite Dept.	26
Greenberg's Sons, M.	32-16
A Gulistan Carpet, Div. J. P. Stevens & Co., Inc.	103

H

A Hartmann-Sanders Co.	249
A Hastings Aluminum Products, Inc.	258
A Haughton Elevator Co.	258
A Haws Drinking Faucet Co.	98
A Hickman Co., W. P.	290
A-I Hillyard Chemical Co.	34
Holophane Co., Inc.	68-69
A-L Home Comfort Products Co.	252
L Honeywell	74

I

A-I-L Inland Steel Products Co.	275
International Harvester Co.	96
International Nickel Co., Inc.	284-285
A-I Irving Subway Grating Co.	122
A ITT Nesbitt, Inc.	22-23

J

A Jamison Cold Storage Door Co.	92
A-I Jones & Laughlin Steel Corp.	202-203

K

A-I-L Kentile, Inc.	7
A-I Keystone Steel & Wire Co.	32-7
A-I Kinnear Mfg. Co.	58
A Knight, H. W., & Son, Inc.	110
A-I Kohler Co.	48
A-I-L Koppers Co.	49 to 54
A Krueger Metal Products Co.	55
K-S-H Plastics, Inc.	219

L

A Laclede Steel Co.	118
Latco Products	32-16
A LCN Closers, Inc.	66-67
Lees & Sons Co., James, Div. Burlington Industries	246-247
Lemlar Mfg. Corp.	276
Lenape Products, Inc.	224
A-L Lennox Industries, Inc.	288-289
A Levolor Lorentzen, Inc.	108A
A-I-L Libbey-Owens-Ford Glass Co.	261 to 264
Lighting Products, Inc.	108D
A Lightolier, Inc.	89
Lockwood Hardware Div., Independent Lock Co.	27
A Loren Cook Co.	268
A Ludowici-Celadon Co.	95
A Luminous Ceilings, Inc.	265

M

A-L Marsh Wall Prods. Div., Masonite Corp.	287
A Matthiessen & Hegeler Zinc Co.	32-15
McKinney Sales Co.	113
McQuay, Inc.	214
A Meadows, Inc., W. R.	279
A Mercer Plastics Co., Inc.	299
A Michaels Art Bronze Co.	299
A-I Mosaic Tile Co.	269
A-I Musson Rubber Co., R. C.	276

N

A-I National Coatings Corp.	282A-282B
National Concrete Masonry Assn.	225-226
A National Lead Co.	303
A New Castle Products, Inc.	242-243

O

A O'Brien Corp.	276
A Otis Elevator Co.	237
A-I-L Owens-Corning Fiberglas Corp.	88

P

Pacific Gas & Electric Co.	32-13
A Paragon Swimming Pool Co., Inc.	295
Pilkington Brothers Limited	97
A-I-L Pittsburgh Plate Glass Co.	220-221
A Plastel Products Corp.	59
Prescon Corp.	294
A Presstite Div., Interchemical Corp.	283
A-I Prestressed Concrete Institute	18-19
A-I Products Research Co.	213

R

A-I Raynor Mfg. Co.	231
A-L Red Cedar Shingle & Handsplit Shake Bureau	241
Red Jacket Mfg. Co.	298
A Republic Steel Corp.	296-297
A-I-L Revere Copper & Brass, Inc.	211
A Rheem Mfg. Co.	257
A Rixson, Inc.	119
A Robbins Flooring Co.	85
A-I Robertson Co., H. H.	223
A Rohm & Haas Co.	93
A-L Rolscreen Co.	101-102
A-I-L Ruberoid Co.	114-115
A RUSSWIN, Div. Emhart Corp.	20-21
A-I Rust-Oleum Corp.	205

S

A St. Charles Mfg. Co.	109
St. Joseph Lead Co., Metals Div.	233
A Sargent & Company	306-307
A Sargent & Greenleaf, Inc.	268
A-I Schaefer, Commercial Refrigeration Div. Studebaker Corp.	110
Schemenauer Mfg. Co.	207
A-I Schokbeton Products Corp.	291
A-I Silbrico Corp.	259
A-I Simmons Co.	210
A-I Sloan Valve Co.	4th Cover
Southern California Edison Co.	32-8, 32-17
A-L Southern Pine Association	11
A Speakman Company	79
Square D Company	117
A-I Standard Conveyor Co.	90
A Steel Joist Institute	111
Sweet's Catalog Service	313
A-I-L Symons Mfg. Co.	80
Synkoloid Company	32-6

T

Talk-A-Phone Co.	204
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A Thermoproof Glass Co.	70
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WF-78

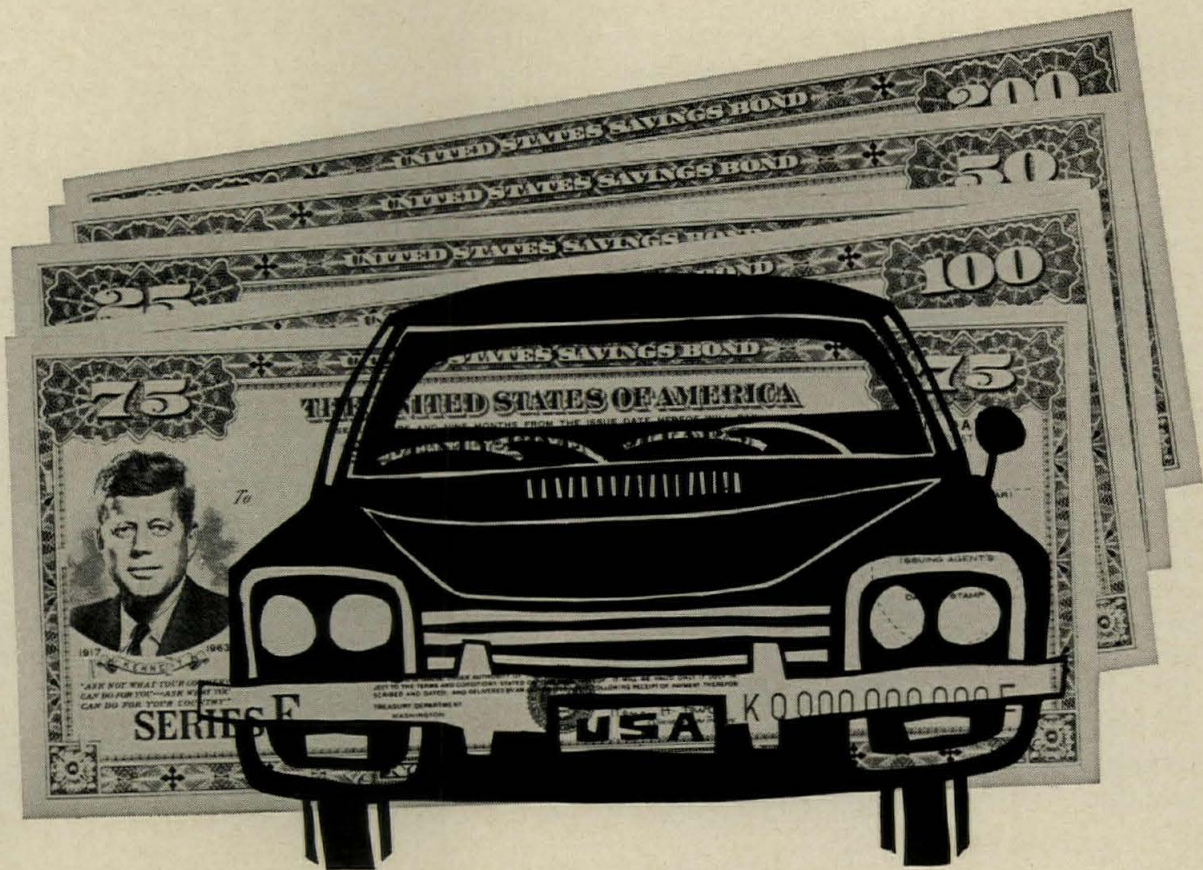
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