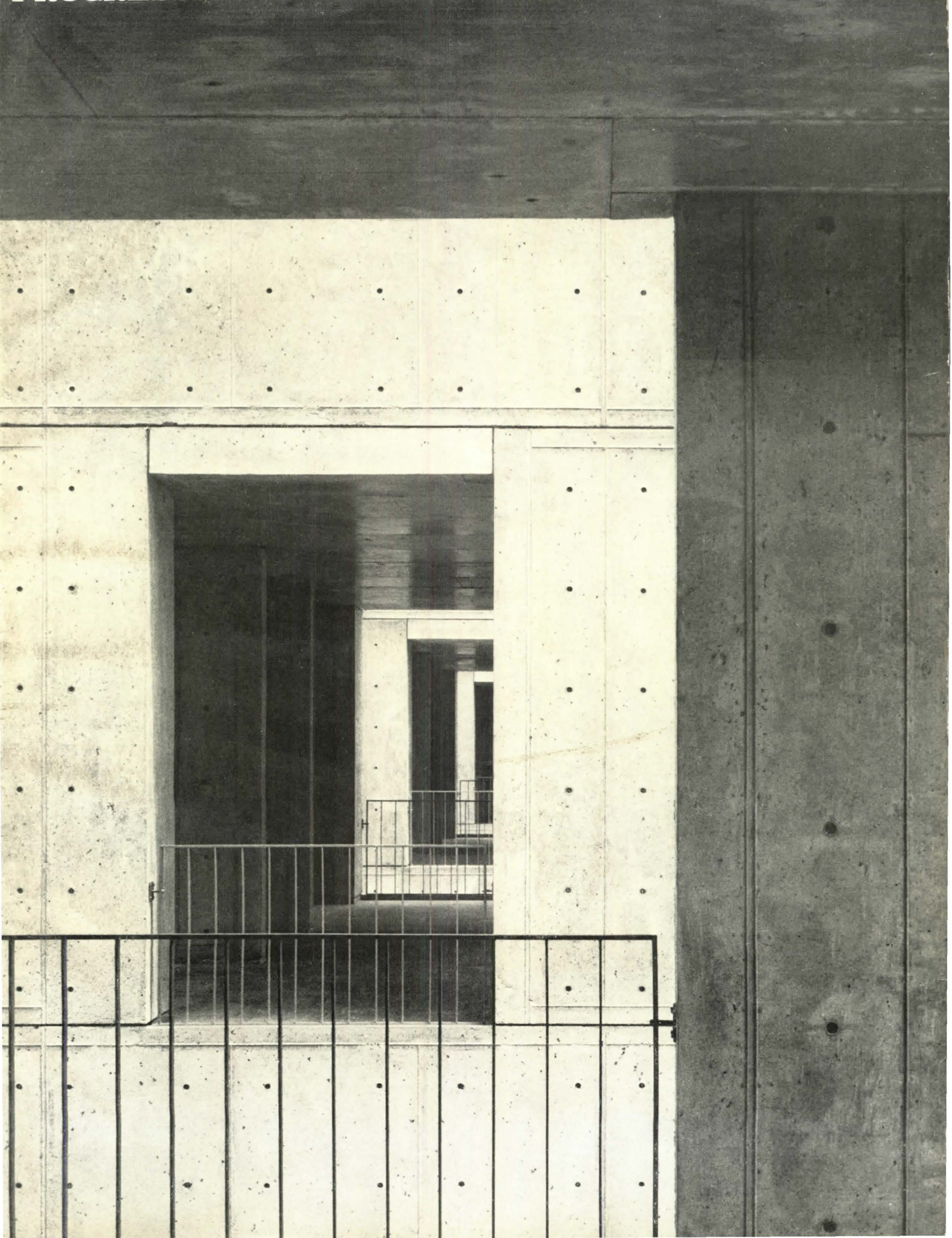
PROGRESSIVE ARCHITECTURE *October 1966*



# Meet the floor that's tough on the top, soft on the bottom, great on the feet.

Wear layer

Cushioncord backing

Interlayer

## New Armstrong Cambrian Vinyl Corlon

**Comfortable.** Here's a dramatically different type of resilient floor for commercial and institutional buildings. Underneath its handsome heavy-duty vinyl surface is a thick layer of foamed vinyl called Cushioncord that makes Cambrian Corlon delightfully comfortable to walk on. It gives beneath your feet—cushions every step.

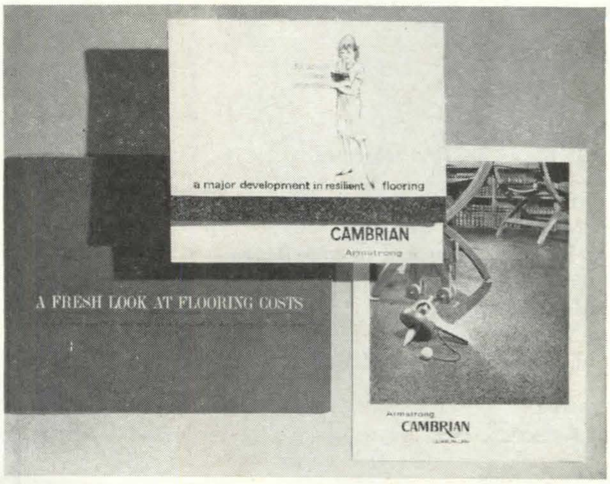
**Durable.** For all its light-footed comfort, Cambrian Vinyl Corlon is so tough, even spike heels won't permanently dent it. It's engineered to provide years of hard-wearing service. For example, floors of Cambrian Corlon were installed in heavy-traffic areas of a model home constructed by the Springs Mills Inc. in Wagram, North Carolina. Springs Mills officials report that after more than 100,000 people toured the home over a four-week period, Cambrian showed no evidence of wear whatsoever.

**Quiets foot traffic.** Cambrian's foamed vinyl cushion absorbs impact noise, too, so a Cambrian Corlon floor is as quiet as it is comfortable. It also substantially reduces the amount of impact noise transmitted between floors of multistory buildings.

**Sealed seams, quality guarantee.** Cambrian Corlon comes in long rolls, six feet wide, for a minimum of seams. And what few seams there are can be sealed by a special installation technique developed exclusively for Cambrian, making them waterproof. Installed by craftsmen carefully trained in this technique, a floor of Cambrian Corlon carries an Armstrong guarantee that covers both material *and* installation.

**Easy maintenance.** Cambrian's sealed seams and nonporous vinyl composition keep dust and dirt at the surface where they can be easily removed with routine resilient floor maintenance.

**Distinctive design.** Cambrian has thousands of stone-like vinyl chips set in a bed of translucent vinyl. It has a richly textured surface and comes in eight different decorator colorings.




**For samples and technical data on Cambrian Vinyl Corlon,** write Armstrong Cork Company, 310 Watson Street, Lancaster, Pa. We'll also send you copies of new studies of comparative use costs of resilient flooring versus carpet. One presents data compiled through independent research by the Wharton School of Finance and Commerce, University of Pennsylvania. Another, "A Fresh Look at Flooring Costs," is based on 113,000,000 square feet of floors installed in commercial and institutional buildings. For personal assistance on any flooring need, contact the Armstrong Architect-Builder-Contractor Representative at your Armstrong District Office.

**Specification data on Cambrian Corlon:** *composition:* vinyl chips embedded in translucent vinyl surface, on foamed vinyl, Cushioncord backing. *Gauge:* nominal .175". *Surface properties:* excellent impact and indentation resistance (200 psi); good resistance to grease, chemicals, alkalis. *Available in:* 8 colorings, in 6'-wide rolls up to 75' long. *Installation:* above, on, and below grade. *Cost:* \$1.35 to \$1.50 sq. ft. installed.

Armstrong

Cambrian, Cushioncord, and Corlon® are trademarks of Armstrong Cork Company.



On Readers' Service Card, Circle No. 318

# THIS MONTH IN P/A

*Progressive Architecture*® *October 1966*



171 **EDITORIAL**
The architect's emotional investment in the idea of permanence, a characteristic of concrete, leads P/A's Editor to some diverting conclusions.

**COMMENTARY AND ANALYSIS**

172 CONCRETE: WHERE DO WE GO FROM HERE?

172 INTRODUCTION: P/A re-evaluates the direction of architectural concrete and its structural potential.

173 THE EXPERTS ARGUE: Hundreds of professionals across the country debate the problems and promise of concrete, baring strongly felt and often controversial opinions.

173 PUTTERING WITH THE POTENTIAL: Has the structural potential of concrete already been reached?

176 DOES CONCRETE WORK, WORK?: How can the gap between work specified and work performed be bridged?

181 WHO BOSSES CONCRETE?: Is the architect truly in command in shaping the final product?

184 WILL TASTE FINISH CONCRETE?: Does the trend to antiseptic, smooth-surface concrete contradict the nature of the material?

186 CAST-IN-PLACE VS. PRECAST TECHNIQUE: What are the advantages and limitations of each system?

190 SEARCHING FOR THE ULTIMATE PLASTICITY: Can the inherent plasticity of concrete be in any way improved upon?

191 CURTAIN WALLS: MORTIFIED OR JUSTIFIED?: Is the concrete curtain wall a passing fad, or will it develop to a riper potential?

196 FROM PRECAST CONCRETE TO INTEGRAL ARCHITECTURE: Aldo Cossutta, a partner of I. M. Pei & Partners, traces the development in his work from concrete curtain wall, to loadbearing wall, to an architecture integrated with mechanical and structural systems.

208 KOMENDANT ON CONCRETE: Dr. August Komendant airs his thoughts on Louis Kahn as an architect who instinctively turns to concrete; the structural philosophy of Habitat '67; the creative collaboration between architect and engineer.

214 CONCRETE INTERIORS: The possibilities of achieving an homogenous architecture by using exposed concrete on interiors as well as exteriors, with examples from the work of Louis Kahn, Paul Rudolph, SOM, and Kelly & Gruzen.

220 EXPOSING CONCRETE: A PRECASTING PRIMER: Ground rules for specifying mixes, curing and handling panels, and several techniques for exposing aggregates.

225 HOW TO SELECT EXPOSED AGGREGATES: What tests to specify for sound aggregates, and the means of obtaining the desired color finish.

226 BUILDING A CITY WITH KING KONG BLOCKS: Montreal's Habitat '67 holds promise as an innovational system of precast concrete construction.

71 **P/A NEWS REPORT**
Chagall murals at the Met . . . Revised plans for Philadelphia courthouse . . . A modern cathedral to rise in Illinois . . . Science discovers how to make building blocks of soil . . . Washington column . . . Products . . . Data.

**P/A OBSERVER**
238 WHITNEY OPENS: Marcel Breuer makes a forceful architectural statement in his design of the new Whitney Museum of American Art.

242 FOCUSING UNIVERSITY DEVELOPMENT: The new master plan for Kent State University in Ohio achieves a judicious "tightness" while at the same time allowing some open-endedness for future expansion.

244 CHICAGO CIVIC CENTER: DIGNITY AND CONTINUITY: The new Chicago Civic Center does justice to the Miesian tradition while respecting the existing architecture.

248 NYU AND THE NAKED EMPEROR: Recent municipal hearings on the controversial NYU library proposal showed the profession to be curiously silent on the limitations of the design.

251 A NIGHT AT THE OPERA: Wallace K. Harrison's new Metropolitan Opera House is the subject of some pointed comments by William Shakespeare.

254 **MECHANICAL ENGINEERING CRITIQUE**
The trend to installing mechanical equipment above ground level in high-rise buildings is discussed by William J. McGuinness.

258 **SPECIFICATIONS CLINIC**
What is the difference between performance specifications and descriptive specifications? Harold J. Rosen explains.

260 **IT'S THE LAW**
Can an injured construction worker sue the architect? Bernard Tomson and Norman Coplan discuss a recent lawsuit where such a charge was filed.

262 **BOOK REVIEWS**
A cross-section of significant new books.

6 **VIEWS**
Our readers' comments on the architectural scene.

**COVER**
Detail of Louis Kahn's Salk Research Institute, La Jolla, Calif. Photo: Julius Shulman.

170 **FRONTISPIECE**
Spalled concrete. Photo: Forrest Wilson.

169 **TITLE PAGE**
From remarks by two of the experts interviewed for this issue.

356 **JOBS AND MEN**

358 **DIRECTORY OF PRODUCT ADVERTISERS**

361 **READERS' SERVICE CARD**
A monthly service to P/A readers who desire additional information on advertised products and those described in the News Report, those who wish to order Reinhold Books, or who want to enter their own subscriptions to P/A.

PROGRESSIVE ARCHITECTURE, PUBLISHED MONTHLY BY REINHOLD PUBLISHING CORPORATION, 430 PARK AVENUE, NEW YORK, N.Y. 10022. RALPH W. REINHOLD, CHAIRMAN OF THE BOARD; PHILIP H. HUBBARD, SR., PRESIDENT AND TREASURER; FRED P. PETERS, EXECUTIVE VICE-PRESIDENT; KATHLEEN STARKE, SECRETARY AND ASSISTANT TREASURER; C. M. BURNAM, JR., H. R. CLAUSER, PHILIP H. HUBBARD, JR., THOMAS N. J. KOERWER, HARRY J. MARTIN, JR., JAMES B. ROSS, VICE-PRESIDENTS. EXECUTIVE AND EDITORIAL OFFICES, 430 PARK AVENUE, NEW YORK, N.Y. 10022.

SUBSCRIPTIONS PAYABLE IN ADVANCE. PUBLISHER RESERVES RIGHT TO REFUSE UNQUALIFIED SUBSCRIPTIONS. SUBSCRIPTION PRICES TO THOSE WHO, BY TITLE, ARE ARCHITECTS, ENGINEERS, SPECIFICATIONS WRITERS, ESTIMATORS, DESIGNERS, OR DRAFTSMEN, AND TO GOVERNMENT DEPARTMENTS, TRADE ASSOCIATIONS, ABOVE TITLE GROUPS ON TEMPORARY MILITARY SERVICE, ARCHITECTURAL SCHOOLS, ARCHITECTURAL STUDENTS, ADVERTISERS AND THEIR EMPLOYEES: $5 FOR ONE YEAR; $8 FOR TWO YEARS; $10 FOR THREE YEARS. ALL OTHERS: $10 A YEAR. ABOVE PRICES ARE APPLICABLE IN U.S., U.S. POSSESSIONS, AND CANADA. ALL PRACTICING ARCHITECTS AND ENGINEERS OUTSIDE THESE AREAS: $10 FOR ONE YEAR; $16 FOR TWO YEARS; $20 FOR THREE YEARS. ALL OTHERS: $20 A YEAR. SINGLE COPYS $2, PAYABLE IN ADVANCE

 INDEXED IN ART INDEX, ARCHITECTURAL INDEX, SECOND-CLASS POSTAGE PAID AT NEW YORK, N.Y., VOLUME XLVII, NO. 10.

On Readers' Service Card, Circle No. 350

# VIEWS

### *Some Psychedelic Comments*

Dear Editor: Your cautiously unsigned article, "LSD: A Design Tool?" in the AUGUST 1966 P/A, could be easily ignored as a sensationalist sop for architectural impotence. All the clichés in the English language, so generously employed, cannot prevent the conclusion that "there is really no thinking process involved" in this store-bought creativity, and that no amount of LSD, mescaline or P/A will make silk purses out of "a mass of protoplasmic jelly."

What is less hilarious and impossible to ignore is the devastating effect your irresponsible, medically blatantly incomplete invitation to "a delightful experience" will have on architectural students. In the time-honored escape from jaded middle-aged frustration, you celebrate in your Editorial the flaming youth that will revolutionize design to a point where it "will finally join the ranks of humanity." But these creatively pregnant "jazzy, oppy, poppy, teenyboppers" (dear God!) are sold by you into the sickest, most destructive and most permanent drug slavery imaginable because the natural restraints of fear and guilt have been removed. It is a criminal misuse of your influence to advertise conceptual shortcuts (at three bucks a journey) to the slow, painful and self-achieved integration process of designed vision with pragmatic reality. Architecture has nothing whatsoever to gain from "the glow of (synthetic) spring mornings," from "the feeling of being separated from other people and the physical environment," "the losing of structures one functions with," or the "midwife quality" of neurologically destructive "facilitators." No one objects if you enjoy "swinging (P/A in your free hand) from a tree with a lot of other people . . . all pretty much simian."

But I for one am appalled and disgusted that such double-talking nonsense is added to the already alarming confusion of the next generation of architects.

SIBYL MOHOLY-NAGY
Professor of Architecture
Pratt Institute
Brooklyn, N.Y.

*[If Mrs. Moholy-Nagy had reacted with less emotionalism and used a more reasoned objectivity instead, she might not so easily have imputed motives to us that do not exist. We are not advocating selling architectural students into drug slavery, any more than "we enjoy 'swinging from a tree with a lot of other people.'" These are Eric Clough's words, not ours. The way in which Mrs. Moholy-Nagy has used the quote unhappily characterizes the distorted reading she has given the whole article. Obviously, we were not "inviting" anyone to "have a delightful experience," but merely reporting the facts. Finally, Mrs. Moholy-Nagy's implication that an interest in the younger generation represents a "time-honored escape from jaded middle-aged frustration" suggests that she may have reached a stage in life where an ability to identify with the young, the new, the vital has passed sadly out of reach.*—ED.]

Dear Editor: *LSD: A Design Tool?* was one of the finest and most objectively written articles I have read on LSD.

ARNOLD WOLMAN
Chicago, Ill.

Dear Editor: I really feel you did a marvelous job on a difficult subject. Most of the articles I have read so far contained much misinformation lacked scientific basis, and tended to sensationalize the subject.

HENRIK BULL
San Francisco, Calif.

Dear Editor: The "sketches by architect Eric Clough of art center designed under the influence of mescaline" are barely distinguishable from the design for an art center made by Le Corbusier in 1910, and published as his first architectural design in the *Gesamtes Werk.* This does not invalidate the euphoric argument that "any copying of or taking directly from any past age or any other culture is ludicrous, meaningless, and has no validity in a fresh design approach," but it does suggest that Le Corbusier's *Complete Works* are just as inspiring as a dose of mescaline, without inducing delusions of grandeur or harmful aftereffects.

PETER COLLINS
Professor Architecture, McGill University
Montreal, Canada

Dear Editor: Re your article on LSD in the August issue.

As a student of architecture, I was extremely pleased that you had the foresight and progressive attitude to include this article, which is certainly of great interest to those students and practitioners who are indeed in tune with the times.

I was prompted to write this letter because I am sure you will receive much mail expressing opposite sentiments.

However, as long as journals of your stature exist as relatively free spirits (not being intimidated by the powers that be), there is still hope that the art of architecture will not decline.

Thank you again for your awareness and curiosity. You serve well those architects who are still creatively-oriented, though the number be few. How sad!

RICHARD SWIFT CAMPBELL
Syracuse, N.Y.

### *Stereotyping the Establishment?*

Dear Editor: In your August Editorial, why have you stereotyped the extant Establishment, the Original Avant-Garde, now the Old Guard of Design, into guilty disgrace with your mighty editorial frown? Do you condemn them all?

Who Designs America? Mass intuitive generation or divinizing of new waves of design ideas is a concept categorically denied by history itself.

Your official declamation that rock-and-roll dives, with their relaxed atmosphere and their piercing electronic sounds, are the fountain source of modern design inspiration, is appalling.

Having seen habitués of such "Cultural Centers" perform their blank-faced marionette-like rituals, we assume that such entranced individuals have taken leave of the reality of our world, rather than vice-versa.

The inference is that our artificial economy has developed such sophistication that an artificial reality must be generated to balance it, plus an artificial culture to define it, and with an artificial oppy-poppy-boppy language to explain it.

The critical substance of your August Editorial does not come through as pertinent to the subject matter of the conference itself. Such gatherings are 90 per cent social, 5 per cent organizational, and 5 per cent spiritual food. To expect more is to be hypercritical.

JOHN W. LEDFORD
V'Soske
San Francisco, Calif.

### *Robert Durham Clarifies His Campaign Platform*

Dear Editor: Thank you for reporting my election as president-elect of The American Institute of Architects in the AUGUST 1966 P/A. The quality of your reporting, however, should leave P/A's face red. Regardless of the reason for my election, "sweetness" was not one of my campaign platforms.

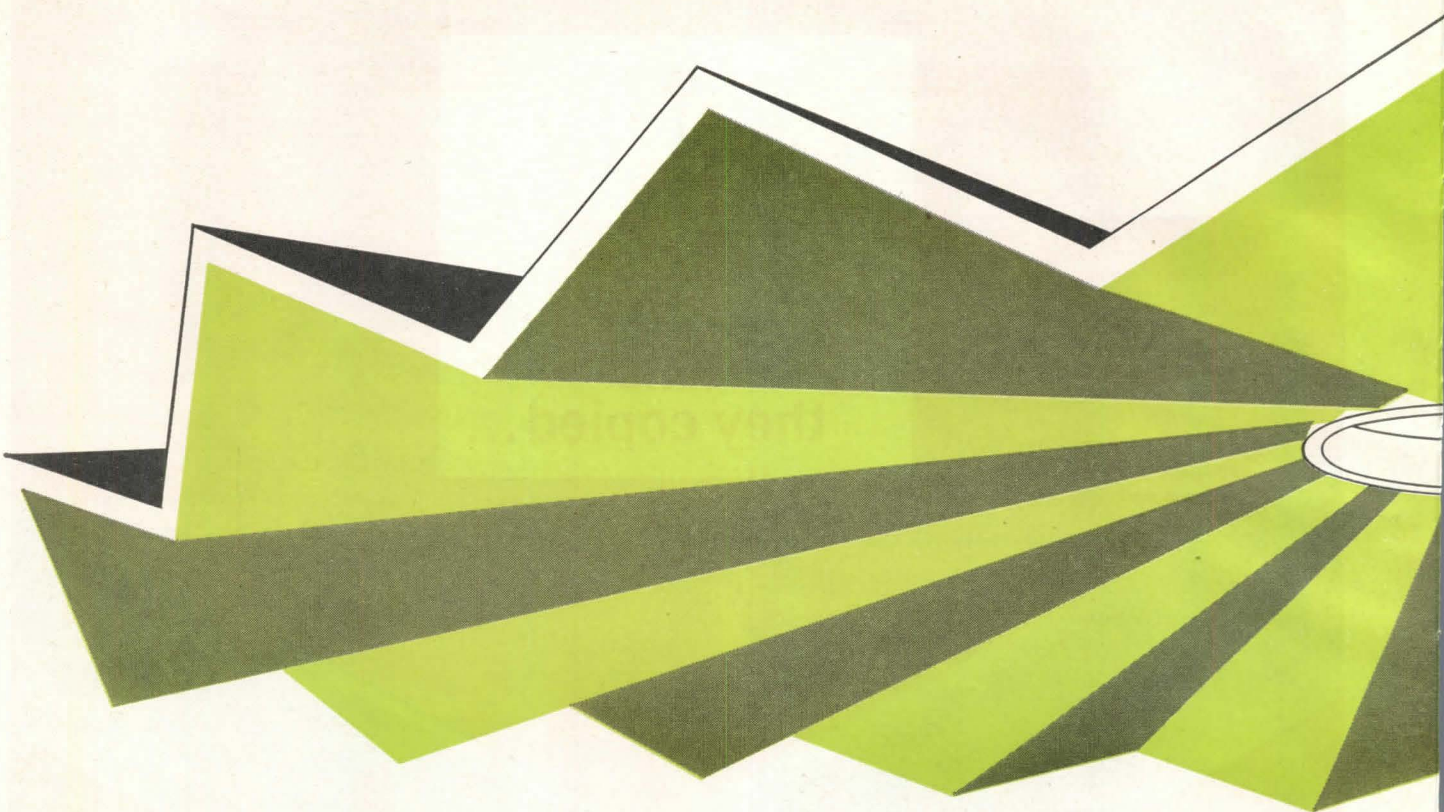
"Sweet Old Bob," as most AIA members know, refers to Robert H. Levison of Clearwater, Florida. The quotation you used in your report was from remarks by Sam Krusé, newly elected director from Florida, in making Levison's nomination for vice-president. He, as well as a host of architects from both Florida and elsewhere, can testify that Bob has earned the title SOB through years of service to AIA and its chapters. I may

*Continued on page 10*

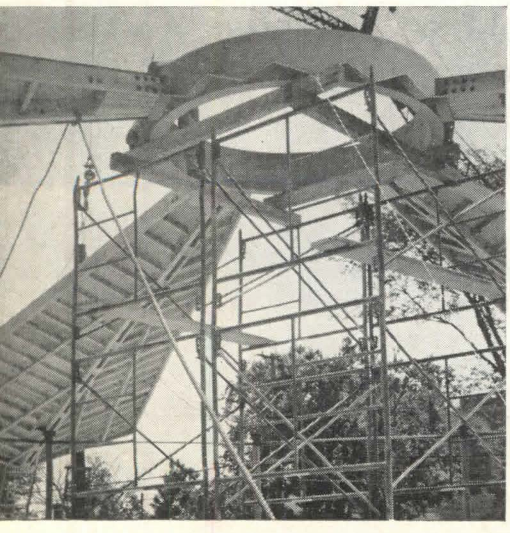


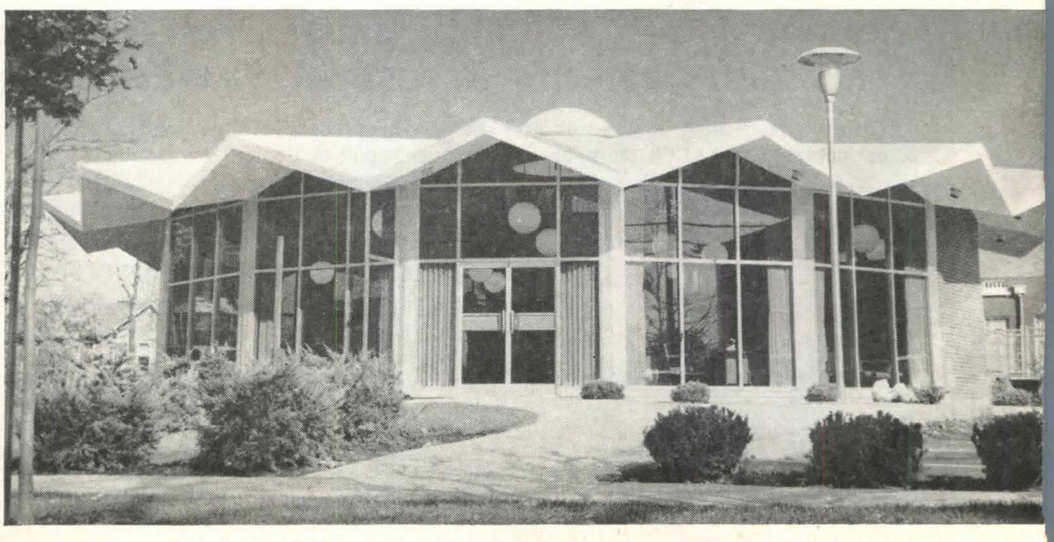



On Readers' Service Card, Circle No. 477



## the most exciting ideas take shape in plywood





*Continued from page 6*

strive for sweetness during my regime, but in the meantime there is only one Sweet Old Bob.

ROBERT L. DURHAM
Seattle, Wash.

### *Just Following a Trend*

Dear Editor: How well deserved is your excellent coverage of the design by Howard Barnstone and Eugene Aubry of our new offices in New York (p. 160, August 1966 P/A). The architects came forth with a daringly simple interior that reflects the spirit of Schlumberger—sober and dynamic.

We do not, unfortunately, deserve your flattering description as "art wealthy. . . . with a discriminating collection." Schlumberger, in all its 250 offices throughout the world, owns but three works of art. One is a large Magritte, which has become our trademark.

Almost all the masterpieces that furnish 9-to-5 life in our offices are rented from the loan collection of St. Thomas University, in Houston, or are borrowed. A "discriminating collection" is due to the discriminating eye of St. Thomas's chairman of the art department, who selected the works.

As do many corporations, we use rather than possess works of art. Rental, such as from the New York Museum of Modern Art, is not expensive. Nor is the purchase of 18th- and 19th-Century engravings, and of contemporary lithographs.

Thanks for all the compliments, but we're just following a trend.

JOHN DE MENIL
Schlumberger Limited
New York, N.Y.

### *The Specifications Writer And the Computer*

Dear Editor: In the August 1966 P/A, Harold Rosen writes about the necessity of introducing computers "or some less sophisticated type of search unit" into specifications work. He is concerned about the tremendous accumulation of information and says, "Reliance on the human mind to absorb and commit to memory thousands of bits of information and to recall this data is virtually impossible. Filing cabinets are likewise becoming inadequate."

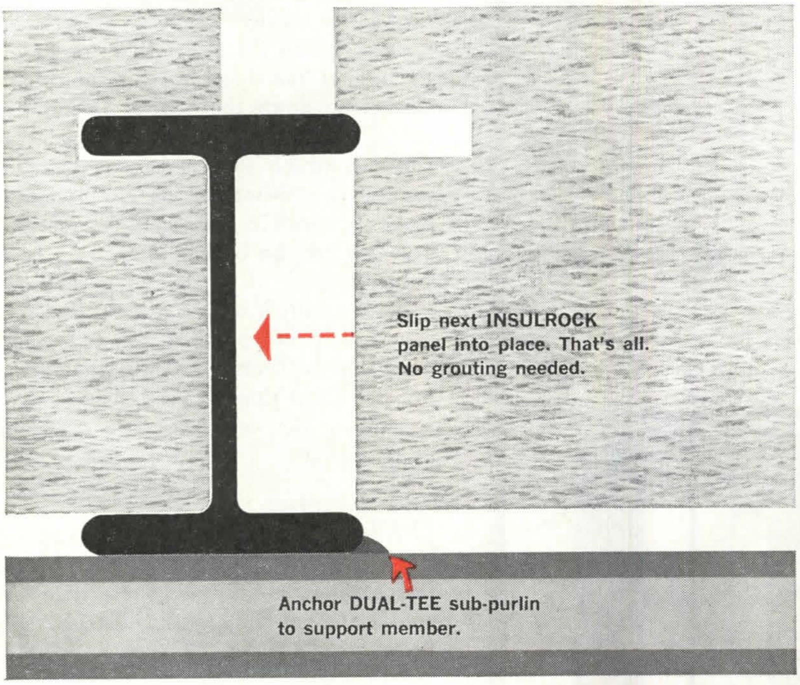
As a specifications writer, I have direct experience of what he is talking about. But I think he is ignoring certain facts about the building industry. Only now, thanks to the CSI format, has the industry standardized on names for components that it uses. This is still a long way from standardizing the design of those components. It is only when *that* stage is reached that the use of computers will become practical.

In the interim, the average architect will have to live with his filing cabinets. However, a change from the old AIA Standard System to one based on the CSI format should be made. Let me illustrate why with one typical example. In the old AIA system, "Dockboards" are filed under 35-i-1.41. In the CSI format, this equipment would be filed under "Loading Dock Devices" in Division 14. For all practical purposes, this would put it under 14-L, using the first letter of the name as suffix. In the same system, "Monorail Systems" would be under 14-M.

The difference between the complexity of the AIA number and the CSI number is significant. It illustrates the distance we are traveling in rationalizing the building industry. The CSI format lists all industry components under 16 divisions, which can be memorized. Division 14 of my example covers all Conveying Systems and includes all such "which utilize power to transport people or materials." (The words in quotes come from the CSI people. I admire their grand objectivity.) The old AIA system, on the other hand, has 41 divisions, which, because of the arbitrary nature

# GROUT IS OUT
## with the
# INSULROCK®
## Dual-Tee™ System

# ...the complete roof deck system




DUAL-TEE is the revolutionary new steel sub-purlin Flintkote designed to supplement the INSULROCK structural portland-cement-bonded wood-fiber deck system. The INSULROCK panels lock around the DUAL-TEE sub-purlins and butt together at the top. What's more, with all the time and money you save by not having to grout, you actually get better thermal insulation with the unbroken upper surface that only INSULROCK panels with DUAL-TEE sub-purlins provide.

Aren't *you* interested in a better decking job for less money? Write Flintkote today for complete details about INSULROCK panels with DUAL-TEE sub-purlins.

FLINTKOTE®

**INSULROCK PRODUCTS**
**Building Products Group**
10 Stuyvesant Ave. • Lyndhurst, N.J. 07071



**On Readers' Service Card, Circle No. 361**

of some of them, were hard to memorize. Then, too, it got very tangled up, as the example I have given illustrates. Note that there is a whole number, then a letter, then a whole number followed by a decimal. But this system was the best available for many years and credit should be given to Theodore Irving Coe of the AIA, who developed it. He must have spent sleepless nights wondering how to list new products within the categories that he and the others had devised. In his time, much was said about the "building industry" that didn't square with reality. An activity becomes an industry only after it has been rationalized, not before. By the same token, only a rationalized activity can use computers. In our semirationalized state, we shall have to continue with filing cabinets as rudimentary data processors, supplemented by our poor old overstrained memories.

Also, there is a need to simplify the catalogs we put in our files. On a catalog, a photograph of a young girl standing in a cornfield alongside slabs of metal is a wonderfully incongruous, existentialist Madison Avenue device for jolting our attention. But young girls are in a natural category; metal catalogs are in a CSI Division. *Vive la difference.* Young girls should not be placed in a file drawer.

ALAN MATHER
Detroit, Michigan

### *R. M. Hunt at the Metropolitan Museum*

Dear Editor: It was good to see the piece on Hunt and the Tribune Building (p. 57, JULY 1966 P/A). I wish, however, you had mentioned one of the last things Hunt did in New York—the entrance, "great hall," and grand staircase at the Metropolitan Museum. The present Fifth Avenue front of the Metropolitan is about 1000 ft long, and the central portion of 300 ft was built around by McKim, Mead & White. The contrast of the portions is quite strong. Hunt is very Beaux-Arts, in what must have been by then an old-fashioned way, with very broad, low archways, tremendous ressaults (meant to hold trophies), and Corinthian capitals and other details odd in proportions or odd in themselves—the whole being naive, brash, and highly effective when seen from up or down the avenue.

McKim, Mead & White were doubtlessly obligated to subordinate their wings, but you get the feeling that they could not *approve* of Hunt's ideas of relief and proportions, and were only too happy to construct effective terminal masses clothed in a Corinthian order of the utmost blandness to echo and possibly tone down the central theme. In any case, I think that Hunt provides a very pleasurable experience, and I would suggest that visitors to the Metropolitan make a leisurely approach on foot in order to get the benefit of it.

Incidentally, the Tribune's tower now under demolition looked exactly like the one in your old photo. I conclude that when the new floors were built, the upper stonework was simply raised, Abu-Simbel fashion, to the new level, somewhat to its detriment.

WALTER C. KIDNEY
Brooklyn, N.Y.

### *The Ell Center: Deserved Recognition*

Dear Editor: I enjoyed your article on the Ell Student Center (JULY 1966 P/A). From your opening euphemism to the last photograph, it was excellent. As a 1966 graduate of Northeastern, I am very happy that the new student center, and hence the university, has been accorded recognition in the form of a feature article in your journal. Northeastern needs and deserves such recognition almost as much as it needs and deserves more buildings like the Ell Center.

I have used nearly all the facilities in

Continued on page 16

***Thiokol turns on its technological force to bring you a***

# SEAL OF SECURITY

**Intensifying its quality assurance program, Thiokol has developed the first comprehensive "Architectural Specification Guide" for building sealants. The achievement backs up its new and advanced performance standards for polysulfide base sealants; its "Tested and Approved" seal* for compounds meeting the standards; its continuous monitoring of performance capability.**

**A significant contribution to progress in structural sealing, Thiokol's authoritative "Architectural Specification Guide for Sealants" offers depth information for easier, surer selection and application of compounds based on LP® polysulfide polymer.**

**The Guide encompasses a wide sealing spectrum, giving detailed specifications and procedures for glazing; for weatherproofing metal curtain walls; for sealing joints in concrete, stone, masonry, as well as deck and paving. Like the "Tested and Approved" seal*—a sign of quality sealant—Thiokol's Guide provides an extra measure of certainty in the job of specifying and applying building sealants.**

***The manufacturer warrants by affixing this seal to his label that the product is a duplicate of materials independently tested and approved by—and in accordance with standards established by—Thiokol Chemical Corp.**

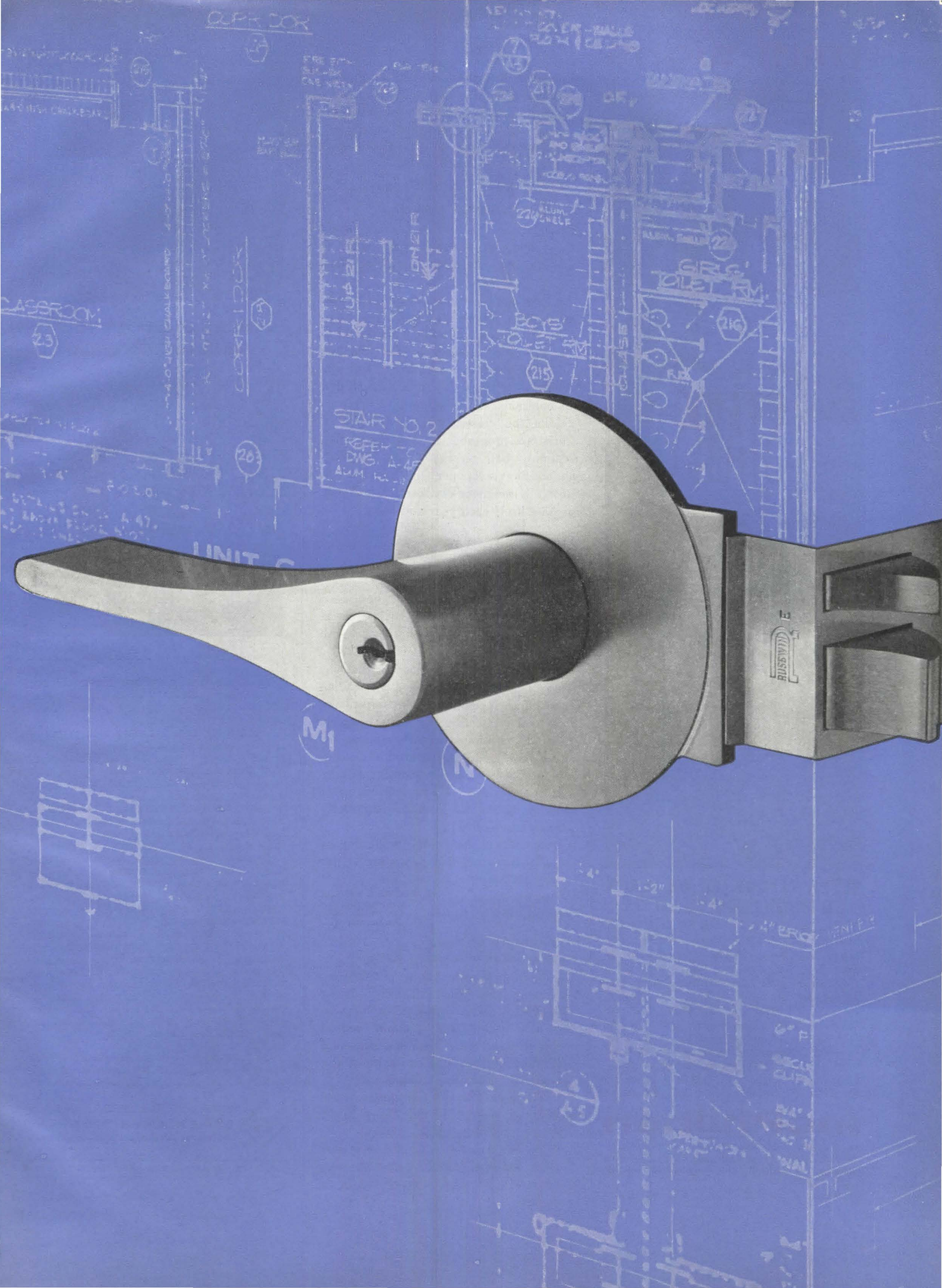
TESTED* AND APPROVED SEALANT BASED ON
Thiokol®
LP®
POLYSULFIDE POLYMER
MANUFACTURED BY LICENSEE OF THIOKOL CHEMICAL CORPORATION


Thiokol manufactures base materials only, not a finished sealant.

## *Now it's your turn*

**Write to Thiokol to get a copy of "Architectural Specification Guide for Sealants" and complete details of new performance standards set for compounds based on THIOKOL® polysulfide polymer. The resultant sealing security has no equivalent.**

**Thiokol CHEMICAL CORPORATION**
780 N. Clinton Avenue, Trenton, N.J. 08607


CORRIDOR
STAIR NO. 2

*Continued from page 12*

the student center, and I don't believe I am far from the student consensus when I say that it is a refreshing departure from the unimaginative monoliths which surround it. I hope your just article may help somewhat to turn that departure into a trend at Northeastern.

JOHN H. LONG
Worcester, Mass.

### *Tongue-in-Cheek Editorial*

Dear Editor: I threw something lovely away today and it came right back. It was my wife. But then she always does, for no good reason.

I have read Jan C. Rowan's Editorial in the JUNE 1966 P/A. I quickly adopted a tongue-in-cheek attitude, volunteered at the recruiting station in The Playboy Club for the war on ugliness, but was promptly rejected for what looked like an habitual case of mumps.

Like the classic Red Skeleton's TV Christmas program, the New Year's Eve dropping ball on the Times Building, and a Sousa summer in Central Park, Rowan's tongue-in-cheeker should perpetuate itself each year and forever.

MICHAEL J. BEECHER
Beecher Associates
Jericho, L.I., N.Y.

### *Tax Exemption And the Church*

Dear Editor: My attention has been called to an enlightening article on p. 151, JUNE 1966 P/A, dealing in part with the tax exempt status of churches.

I should like to make it clear that our trustees have never taken a position opposing the exemption of worship places from real estate tax. We have, however, definitely positioned ourselves in regard to the existing exemption from the corporate profits tax for the "unrelated business" of churches. We regard this as an inequity within the business community and are opposed to it.

I should say, too, that we have done considerable study in the matter of tax exemption for church property.

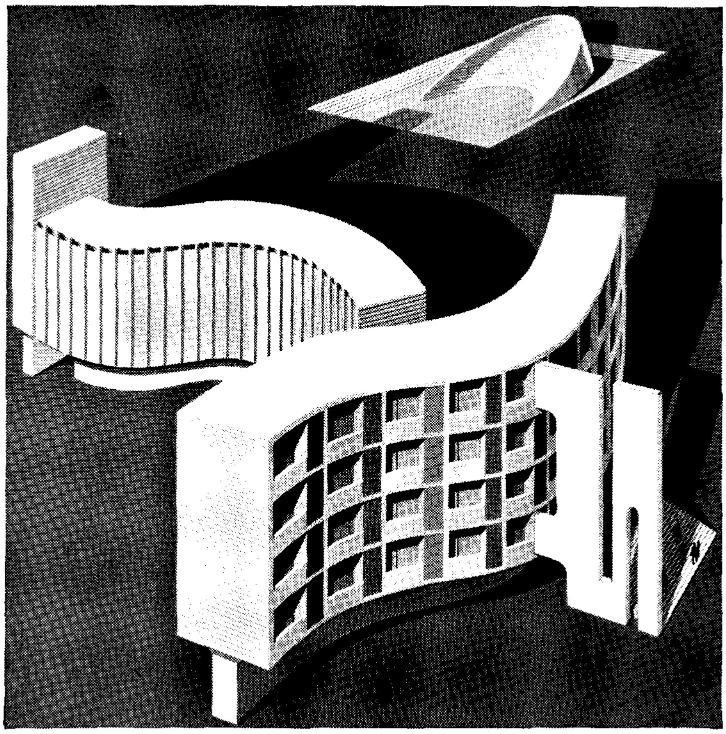
C. STANLEY LOWELL
Associate Director
Americans United for Separation of Church and State
Washington, D.C.

### *A Footnote to the Germantown Planning Study*

Dear Editor: Your recent article "Taking the Cure: Some Case Histories" (JUNE 1966 P/A), while informative, interesting, and useful, does contain certain errors in connection with our Germantown Planning Study, done for the Philadelphia City Planning Commission:

- The book *Historic Germantown* was written by Harry M. and Margaret B. Trikcom and Grant Miles Simon.
- We were neither retained by nor paid by the Redevelopment Authority. Our

*Continued on page 20*



**Today's universities and colleges need modern communications: dormitory room phones, Tele-Lecture, Data-Phone* service, closed-circuit TV facilities, teletypewriter.**

**These complex communication services are essential not only in colleges but in all types of major buildings—plan for them in the blueprint stage and avoid costly alterations and unsightly wiring later.**

**Just call your Bell Telephone Business Office and ask for the Architects and Builders Service.**

AT&T **Bell System**
American Telephone & Telegraph
and Associated Companies

For further information on communications planning, see Sweet's Architectural File 33a/Be and Sweet's Industrial Construction File 19f/Be.

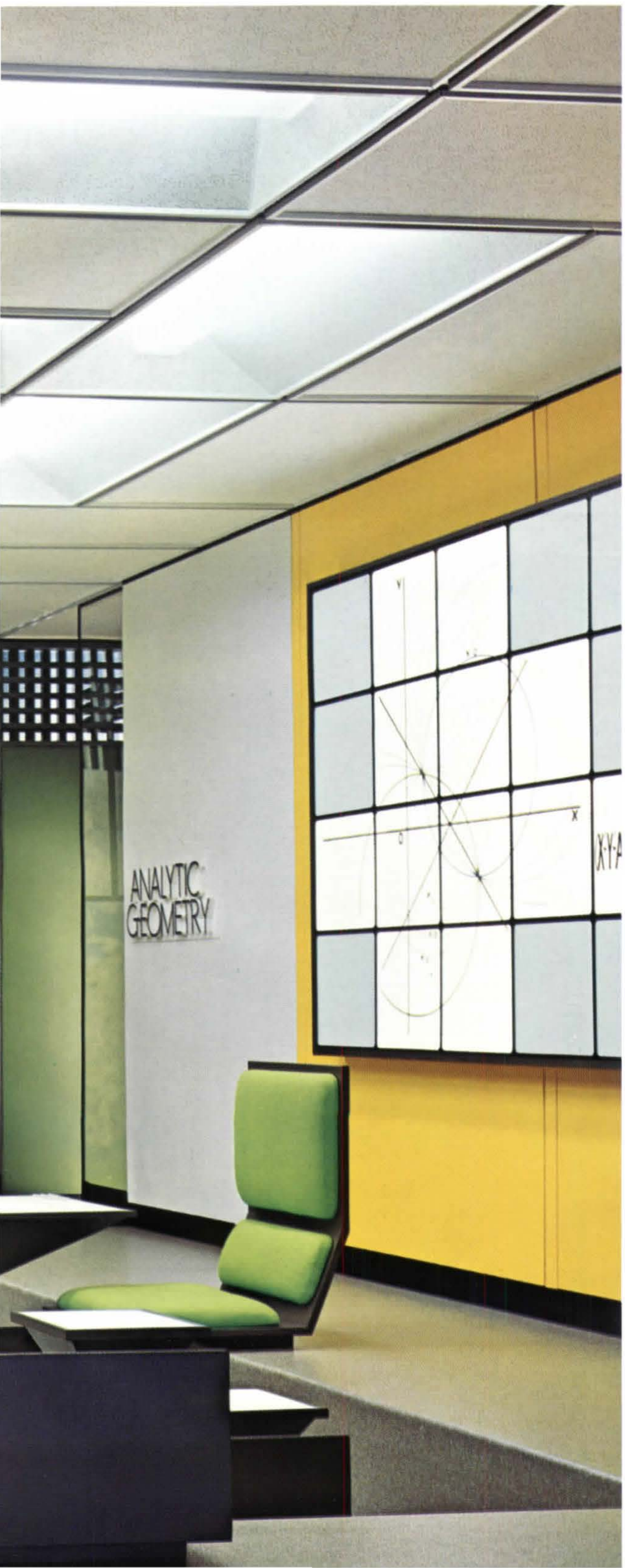
*Service mark of the Bell System

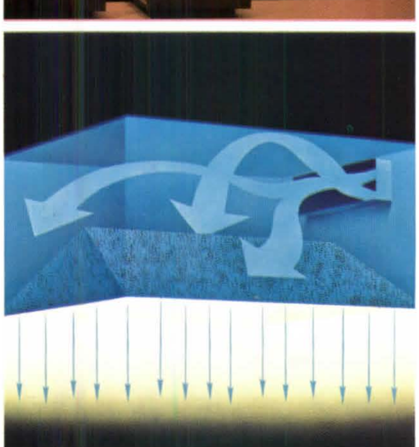
# dram

FINE. BUT IS IT FLEXIBLE, EFFICIENT, ECONOMICAL? WITH THIS

# atic

## CEILING, YOU START WITH A YES ON ALL COUNTS:



Note how it serves this modern school interior. Because the lighting layout possibilities are virtually limitless — as you can see from these photographs — this ceiling can be perfectly tailored to the functional requirements of any room. □ This is the C-60 Luminaire Ceiling System by Armstrong. It lights — using fewer lamps, less wattage to achieve any given lighting level (from 5 to well over 200 footcandles) than a conventional ceiling with recessed fixtures. It distributes conditioned air — using a minimun of ductwork and no diffusers (at rates anywhere from 1 to 5 cfm per square foot). It provides exceptional acoustical control. And, it's economical. Installed cost (depending on light level, layout): from \$1.00 per square foot, including wiring, fixtures. □ The C-60 Luminaire Ceiling System employs a 30″ x 60″ module, carries a 2-hr. UL fire rating. For installation illustrations, application-engineering data, guide specifications, write: Armstrong, 4210 Watson St., Lancaster, Pa. Or circle No. 300 on Readers' Service Card.

LUMINAIRE CEILING SYSTEMS BY
**Armstrong**



*Continued from page 16*

client was the Philadelphia City Planning Commission.

• The Victorian museum is not yet open. What did happen last year was that the Germantown Historical Society *initiated a financial campaign* to restore a fine Victorian mansion and convert it into a museum of the period. (As chairman of the committee, I must regretfully report that we are still very far from the $200,000 we need before we can restore the building and open it as a museum.)

• While it is true that, at the outset of these projects, my associate was Preston Andrade, representing the firm of Wright, Andrade, Amenta & Gane, later in the work Andrade went to India and withdrew from the study. However, his firm did continue with John F. Gane as my associate for this project.

HENRY J. MAGAZINER
Philadelphia, Pa.

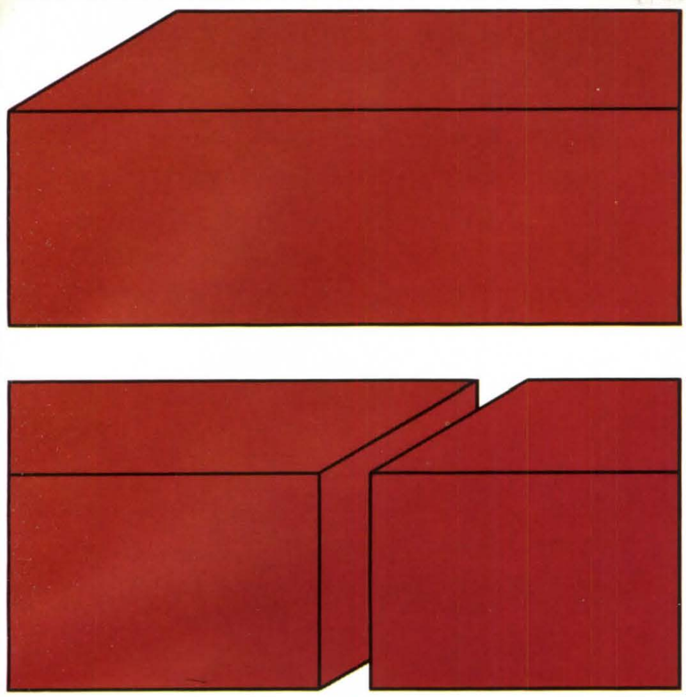
### *Neglected Consultants?*

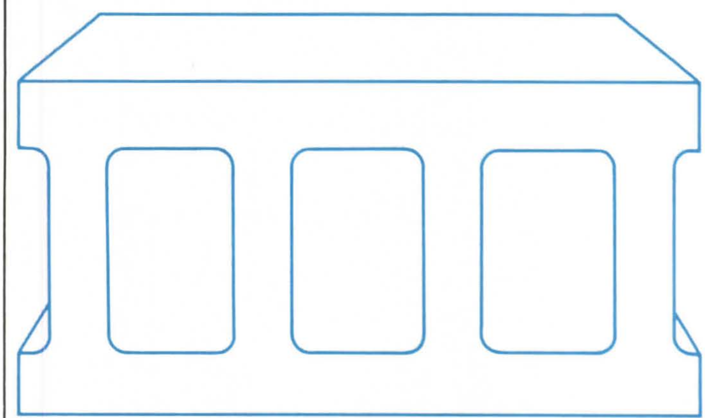
Dear Editor: We have been subscribers and readers of your magazine for some years and have appreciated your efforts to improve the standards of architecture in this country. There is, however, one area where we feel you are not fulfilling your function, and that is your practice of not naming consultants to architects or naming only the major ones (traditionally the structural and mechanical engineers). Admittedly, we are not disinterested in our complaint, since we were the acoustical consultants to the Northeastern Student Union, which you reviewed in the JULY 1966 P/A without including a complete list of consultants.

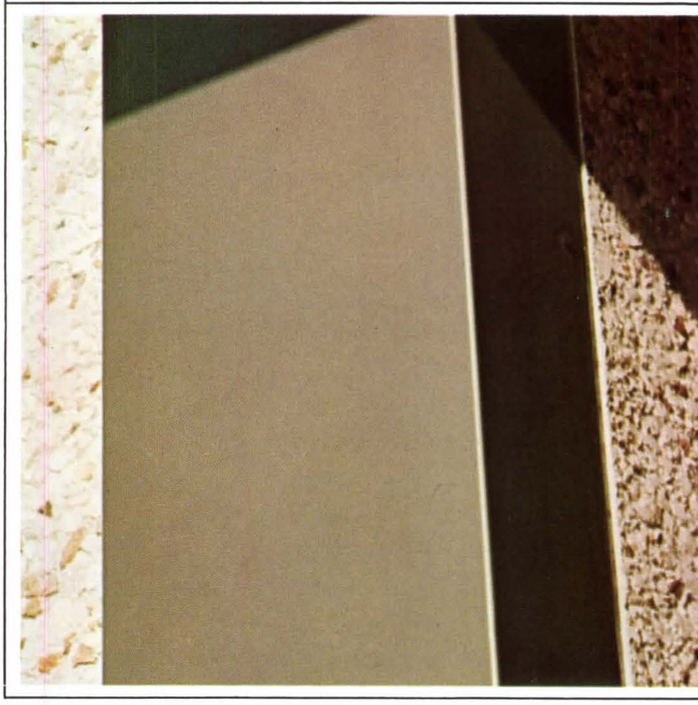
But we are not prompted solely by our need for publicity. Your readers have also been deprived. The effectiveness of a consultant's contribution is really gaged by the lack of evidence of it in the architects's whole design; the general public should *not* be aware of it. To paraphrase a Space-Age proverb: "If all goes well, it is an architectural achievement; if not, it is an engineering failure." Thus it is only the professional critics, such as editors of architectural magazines, who can supply the recognition any craftsman needs for incentive, and also supply the architects with information as to which consultants are performing successfully and which not. And the size of the consultant's fee does not necessarily reflect the importance of his contribution to the over-all success of the project.

We realize that the task of crediting the many consultants an architect employs is not easy, since their areas often overlap.

*Continued on page 30*







The sun glares on, scorching the strong, regimented brick patterns. Duranodic finishes, creating fascinating design and color variations with the brick surface, triumphantly withstand the tarnishing effect of sunlight.

Duranodic 300 finishes are particularly well-suited to continuous exposure; they resist punishing salt air and spray conditions in coastal regions; and hold up under the barrage of the most contaminated industrial atmospheres.

The walls of the city cool as the intense sun begins to lower. Duranodic finishes blend naturally with the oblique patterns of concrete, absorbing the quiet shadows of night.

Duranodic 300 finish is the most recent refinement of Alcoa's finishing experimentation. Its predecessor, the Alumilite* hard-coating process, is still used when there is a need for an extremely hard, dense anodic surface of superior abrasion resistance. Duranodic finishes retain these qualities of toughness and combine them with improved design and texturing capabilities.

*Trade Name of Aluminum Company of America

# And with COMPATIBILITY– Color, Durability, Versatility

Duranodic 300 finishes have been tested in use with practically every other building material. Invariably, Duranodic 300 finishes work to add new richness of color and design.

Alcoa's research techniques have developed precise methods of using Duranodic 300 finishes with other materials in compatible applications, without risking corrosion or discoloration. A simple lacquer applied to the Duranodic 300 finish eliminates possibility of staining when used with concrete or masonry.


The color in Duranodic 300 finishes is electrochemically formed from the aluminum alloy. Because of this process, the coating formed is colorfast and will not chip, crack or blister.

Recent ASTM tests have proved Duranodic 300 finishes more abrasion-resistant than regular anodic finishes, which have been used successfully for more than 35 years. This durability feature is of vital importance when planning construction for extreme exposures.

Because of their reflective capabilities, their high resistance to corrosive and destructive atmospheres, and their compatible nature, Duranodic 300 finishes are versatile enough to be used in nearly all types of construction. Their minimum .7-mil thickness of increased density makes them particularly well-suited for any outdoor situation, as well as in kickplates, railings, or other areas of continuous activity.

Variations of the colors as shown can be supplied by Alcoa upon request. For more information, contact your Alcoa sales office or write Aluminum Company of America, 1001-K Alcoa Building, Pittsburgh, Pa. 15219.

1 Duranodic 324S finish, *Medium Gray* on Anoclad® 12 Sheet

2 Duranodic 335S finish, *Black* on Anoclad A13 Sheet (335E on Anoclad 13 Extrusions— 315E on Anoclad 11 Extrusions is similar)

3 Duranodic 313S finish, *Dark Bronze* on Anoclad 11 Sheet (313E on Anoclad 11 Extrusions)

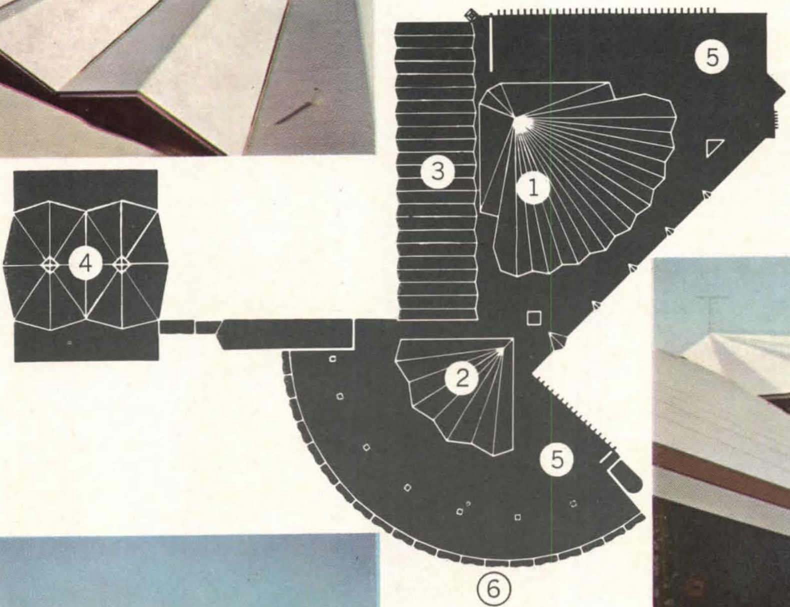
4 Duranodic 311S finish, *Light Bronze* on Anoclad 11 Sheet (311E on Anoclad 11 Extrusions)

5 Duranodic 312S finish, *Medium Bronze* on Anoclad 11 Sheet (312E on Anoclad 11 Extrusions)

CHANGE FOR THE BETTER WITH ALCOA DURANODIC 300 FINISHES

ALCOA

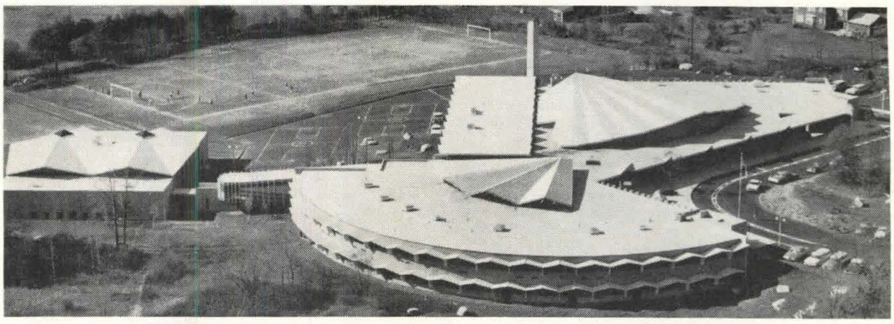
# Roof design declared in




# independence Connecticut

## Johns-Manville roofing materials meet unique needs of Coleytown Junior High School–Joseph Salerno, Architect.

The Coleytown school in Westport, Connecticut, illustrates the new freedom in roof design—with the new generation of built-up roofing materials from Johns-Manville. Here's how advanced J-M roofing products were used with imagination in this functional modern design:



**J-M Last-O-Roof®** was the choice for the fan-shaped folded plates over the auditorium (1) and the library (2); for the roofs of the arts and crafts rooms (3); and the octagon roofs (4) of the detached gymnasium. Last-O-Roof is a single-membrane plastic elastomer roof. It adapts to practically any roof configuration and can be used on practically any slope. Application is fast because the membrane and cements arrive ready to use, require no on-site preparation. The roof is finished with a reflective coating of Last-O-Lume®—white here, but also available in colors.

**J-M Gravel-Surface Roofing** was used on the flat roof area (5). It's built up with Johns-Manville base and finishing felts, plus a flood coating of the J-M bitumen, Aquadam®, and a white gravel topping. Here the gravel surface contrasts attractively with the gleaming Last-O-Roof surfaces that rise from the flat areas.

**J-M No. 80 Flexstone® Roofing** covers the "eyebrow" sunshades (6) over classroom windows. The top ply in this asbestos roof specification is No. 80 Flexstone cap sheet. Its felts are 85% asbestos fiber, so they are actually flexible coverings of stone. These asbestos felts are asphalt-saturated, then asphalt-covered, then firmly embedded with a layer of ceramic granules. No. 80 Flexstone can be furnished in white or in a variety of colors.

**J-M Last-O-Flash®** was specified for all of the flashings. This is a heavy polyisobutylene film embedded with woven glass fiber for extra toughness. Developed as a component for Last-O-Roof, it can also be used with other roof specifications at parapets, eaves, vents, skylights, even as a through-wall flashing . . . in fact wherever flexible, durable flashing or waterproofing material is required.

You may not need the variety of roofing materials and specifications used for the Coleytown school. Or all of the other versatile roofing services available from Johns-Manville. The important thing is that they're at your disposal, offering you complete freedom in the design and construction of any roof. Explore the possibilities in Catalog BU-165A. For your free copy, write Johns-Manville, Box 111, 22 East 40th Street, New York, New York 10016. Cable: JOHNMANVIL.

JM

**Johns-Manville**



On Readers' Service Card, Circle No. 378

# Can practical guest FORMICA® says

Colors and patterns of FORMICA® laminate: Door, wall, divider, beams: Spanish Oak, 344. Vanitories, Spanish Oak and Aqua, 921. Furniture, Spanish Oak with Aqua.

FORMICA® brand laminated plastic can satisfy both demands. It provides many possibilities for superb decors with over 100 solid colors, woodgrains and patterns. And 31 special designs can help add a particular kind of moderate grandeur not attainable with other surfacing materials.

On the practical side, FORMICA® laminate for any application . . . walls, doors, vanitories, furniture . . . gives your client better-than-average return on his investment dollar. It assures cleanliness and simple maintenance. More than that, it eliminates recurring refinishing and replacement costs.

7028

# rooms be elegant?
# yes...here's how

Feature wall: Les Plumes screened print, 7425b.

## Your Formica representative is ready to serve you. Call him!

He has the complete story of the versatility of FORMICA® brand products in commercial and institutional buildings. A good man to know, he will be happy to provide samples, estimates, literature, and spec information.

## Free brochure...


describes how FORMICA® laminate surfaces keep motels beautiful . . . from lobby to executive suite. Gives practical ideas about how to use it in your new motel, addition or remodeling project. Ask your Formica representative for a copy, or write Dept. MP-15

For guest rooms, conference room, dining room, or elsewhere, select FORMICA® brand laminate for the maximum in elegance and the minimum in upkeep.

For right-now information, see the following Sweet's files: $\frac{14a}{fo}$, $\frac{22b}{fo}$, $\frac{14b}{fo}$, $\frac{16c}{fo}$, or call your Formica representative.

FORMICA® BRAND products

*Leadership through innovation* • FORMICA CORPORATION
CINCINNATI, OHIO 45232 *subsidiary of* CYANAMID

FORMICA® is our brand name for laminated plastic, wall paneling, toilet compartments, adhesives and flakeboard



On Readers' Service Card, Circle No. 362

*Continued from page 20*

For instance, your article on the Northeastern University Student Union refers to well-handled acoustical treatment but points out the noisy ventilation equipment. Our commission did not include a review of the mechanical engineer's selection of diffusors or sound traps for the possibilities of high noise levels or cross-talk. Often the architect leaves this aspect in the mechanical engineer's hands, with the result that defects an acoustician would detect go unnoticed.

We sincerely regret the necessity for writing a critical letter, when in other respects we applaud your article and the magazine in general.

KLAUS KLEINSCHMIDT
Senior Engineer, Cambridge Acoustical Consultants
Cambridge, Mass.

Dear Editor: In your article on the Chelmsford Junior High School (JULY 1966 P/A), you neglected to mention the following consultants: Structural Engineers, Souza & True; Mechanical Engineer, Leo J. Crowley; Electrical Engineer, Vern Norman; Landscaping, Laurence Zuelke.

ELIZABETH FITZGERALD
The Architects Collaborative
Cambridge, Mass.

### *Hospital Design: Consulting the Nurse*

Dear Editor: Today, with the increase in building hospitals and nursing homes due to the increased demands for beds, little or no consideration is given to planning of these buildings.

They are not planned hospitals and nursing homes, just a series of rooms with labels attached. Each doctor is only interested in the area where he works, and in the end he comes up with his usual complaints.

The administrator is not a nurse and knows little about daily nursing care duties. Therefore, his planning is highly concerned with money and what he can get to show for it.

The important person on the team, the one who will use this hospital or nursing home, is the nurse who tries to do her best with all the errors.

If an architect planned business buildings as poorly as he does hospitals he would soon have to change his line of work. This is a specialized field and should be improving with each new institution, but many of the same mistakes are made time after time.

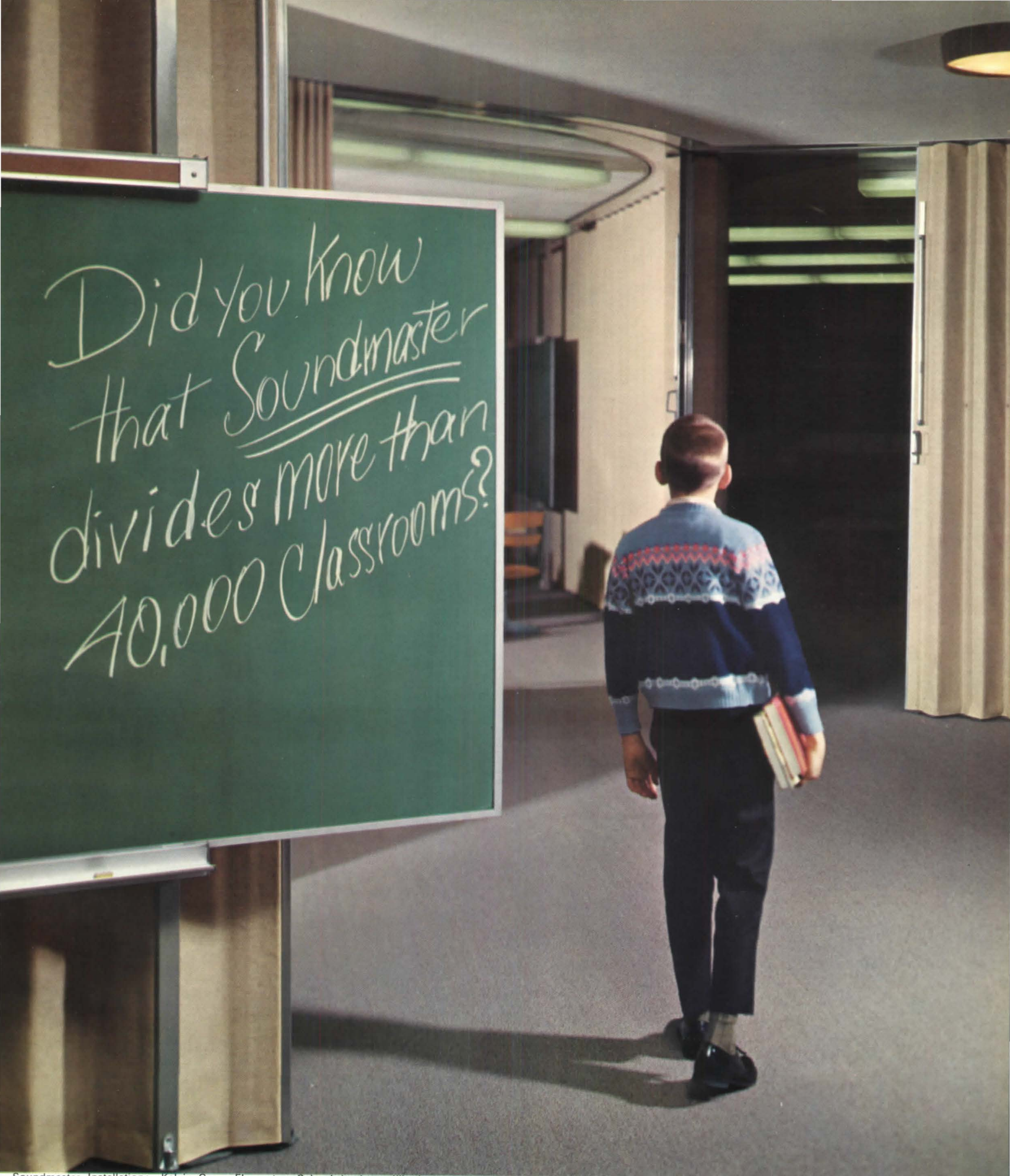
A nurse experienced in planning and management should be on the team from the first day. The architect who will consider a nurse's opinion when planning a nursing home or hospital will find that he has built the "better mousetrap."

MILDRED L. HARVEY
Escondido, Calif.

# Overhead Door Corporation announces the beginning

*Fully transistorized, portable transmitter opens and closes garage door automatically by radio control from your car.*

Think about how your custom home designs can be improved by including a garage door that can actually contribute to the overall beauty of the home. The "OVERHEAD DOOR" electric, the door that opens and closes by remote control can do this for you. The "OVERHEAD DOOR" is available in literally hundreds of beautiful designs encompassing every architectural style and treatment. That's why we call it the "gracious" garage door. They are available in standard widths up to 18 feet and custom-engineered in special sizes, giving you greater design flexibility. Give your imagination free rein; we can supply the perfect garage door for any home you design! You can specify The "OVERHEAD DOOR" electric with total confidence. It's rugged. No other door in the industry has so many quality construction features. Of course,




Soundmaster Installation: Kelvin Grove Elementary School Lockport, Illinois    Architects: Alexander, Borkon, Westphal & DeYoung Joliet, Illinois

**"Yes, Modernfold. What's new?"**

# acousti

Acousti-Seal Installation: Crawford Elementary School
Denver, Colorado

Architects: Atchison, Kloverstrom, Saul & Atchison
Denver, Colorado

## *. . . when total sound control*

When this operable wall is closed, the rattle and clatter of the cafeteria will not interfere with choral practice. Why? Because Acousti-Seal 51 comes closer to total sound control than any other operable wall on the market*. Specifying the best in performance will be assurance of complete client satisfaction with the job in any situation, today or in the future.

The high sound control performance of Acousti-Seal 51 begins with panel design; incorporating steel faces with the right amount of acoustical limpness, the proper inner dead air space, and ab-

# seal 51®

## 's needed, this operable wall should be specified

orbent liners of insulation. Then, making sure all dges are firmly sealed to prevent sound leaks. cousti-Seal 51 was designed to handle critical ound situations.

Acousti-Seal 51 is the operable wall for audio-isual sections, team teaching areas, classrooms, otel or motel meeting rooms and conference rooms.

The easy manual operation is quick and uncom-licated. One turn of a lever seals out sound.

There are no involved maintenance delays. Cus-odians can handle simple adjustments, if ever re-uired.

Acousti-Seal finishes are versatile. Select from over 400 tough but colorful vinyls for years of hard use. (Optional "Tedlar"† surfacing can add stain resistance equal to ceramic tile.) For the richness of wood, over 50 veneers may be specified. Chalk and tackboards can be applied to panel faces.

We would like the opportunity to give you all the facts about Acousti-Seal operable walls.

*Sound Transmission Class 51—Geiger and Hamme full scale 14'0" x 9'0" test (ASTM E90 61T) compared to all published data available.

†Du Pont registered trademark

# MODERNFOLD

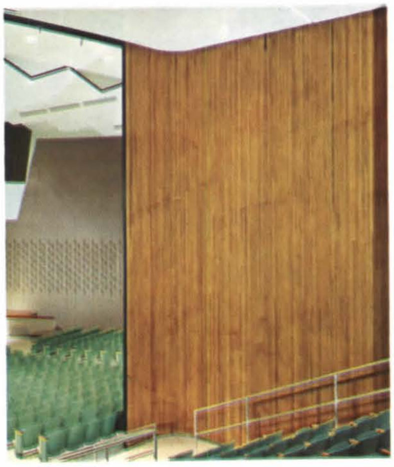
## Now more than ever—a single source for all your space division needs

Most projects you are working on today have maximum space utilization problems that operable walls can solve. And Modernfold has the product.

Call your Modernfold distributor. He is anxious to work with you. Or, call us direct (Area Code 317—529-1450.) We will see that you receive every assistance you require.

**SOUNDMASTER**—Most economical and versatile vinyl covered sound control operable wall made. A model and size for every need.

**ACOUSTI-SEAL**—Top sound control operable wall in the industry.



**SPLEN-DOOR**—Aluminum or steel. Color selections include Alcoa "Duranodic"* finishes.

*Reg. TM of Alcoa

**AUDIO-WALL**—Vinyl-clad steel paneled operable wall with high sound control efficiency.

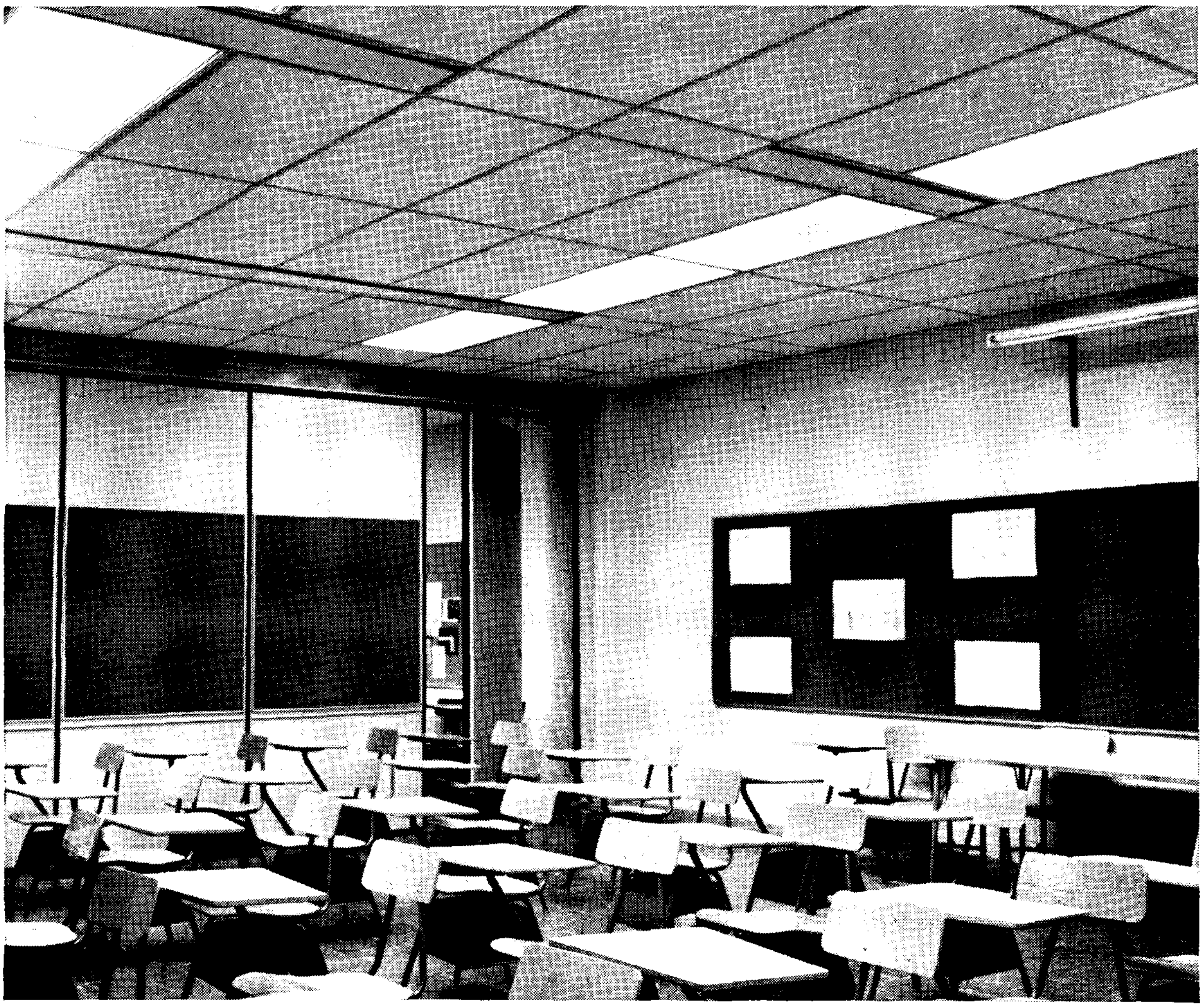
**COIL-WAL**—A giant coiling wall of wood for subdividing gymnasiums, auditoriums, and other large areas.

**WOODMASTER**—Superbly designed wood wall in over 55 veneers and finishes.

modernfold®

NEW CASTLE PRODUCTS, INC
NEW CASTLE, INDIAN

In Canada: New Castle Products (Canada) Ltd.
St. Lambert, Quebec



Classroom of Randolph Junior High School, Montgomery County, Maryland.
Architect: Burket, Tilghman, Nelson Associates. Consulting Engineer: H. Walton Redmile Associates.

# Will you step into this classroom for a moment, please?

We'd like to call your attention to two things.

One that you can see: our new Carrier Moduline® Ceiling Air Terminals with automatic self-contained temperature control.

And the other you can't: a new kind of air conditioning system using the Moduline units in a Dual Conduit System®.

Classroom walls can be folded back to create a large team teaching area. Yet expansion or contraction of teaching space poses no problems for the Carrier Dual Conduit System with Moduline units because of its inherent modular air distribution and control.

The Moduline units provide Randolph Junior High and other schools with a space-saving all-air system that heats or cools in each module at the command of a built-in thermostat. Operating costs are low because it always "follows the load," taking full advantage of diversity afforded by unoccupied areas.

Moduline units also make possible a very simple variable-volume *single duct system*. It is ideal for economical automatic temperature control in office buildings and hospitals. Control zones as small as 100 square feet are highly practical. Partitioning modules may be as small as 25 square feet.

* * *

We've covered both systems in detail in a brochure that illustrates many attractive ceiling arrangements achieved by architects using Moduline units.

For your copy of "Carrier puts climate control into a new perspective," call your nearest Carrier representative. Or write us in Syracuse, New York 13201. In Canada: Carrier Air Conditioning (Canada) Ltd.

**Carrier Air Conditioning Company**

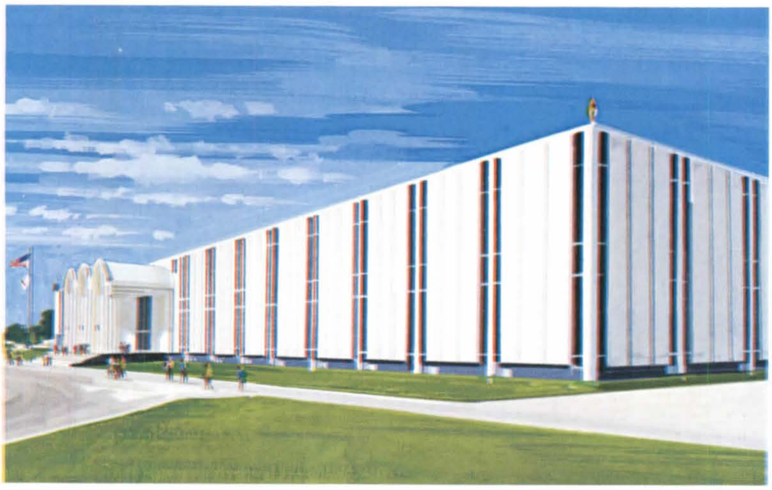
More people put their confidence in Carrier air conditioning than in any other make

On Readers' Service Card, Circle No. 338



◄ On Readers' Service Card, Circle No. 405

# *Look what they're doing with steel framing for schools these days*



Architect: Bruce and Parrish AIA and Glenn Quincy Johnson AIA; Engineer: John A. Bedingfield & Associates; Structural Engineer: Matthew Bodo; Steel Fabricator: Coastal Steel Construction Co.; General Contractor: Earl Lamb.

**Azalea Junior High School**
**Pinellas County, Fla.**

This 1,000-pupil junior high was designed with a steel frame, and low bid was well within the budget. Steel framing also helped speed construction: the school was occupied only 10 months after the contract was awarded.

Architect: John F. Lipaj Associates; Engineer: R. M. Gensert Associates; Steel Fabricator: Republic Structural Iron Works; Steel Erector: Tri-County Erection, Inc.; General Contractor: Dileno Construction Co.

**Arlington Elementary School**
**Parma, Ohio**

Taking advantage of the flexibility of steel design, the architects came up with this steel-framed school-in-the-round. Each room has its own entrance from outdoors, and the classrooms are exceptionally spacious as well as attractive.

Architect: Pope, Kruse & McCune; Engineer: L. H. Doane Associates, Inc.; Steel Fabricator: Pilgrim Steel Company; Steel Erector: Erectors, Inc.; General Contractor: William C. Ehret, Inc.

**Thomas McKean High School**
**Wilmington, Del.**

Steel's flexibility is strikingly exhibited in the hexagonal steel pods which make up this functional design. Each pod contains six classrooms. The design led to economical fabrication of steel because of repetition between pods. And the overall effect is unique.

Architect: Pharo & Haas Architects; Engineer: G. Edwin Pidcock Co.; Steel Fabricator: Bethlehem Fabricators, Inc.; Steel Erector: Posh Construction, Inc.; General Contractor: William P. Doall, Inc.

**East Hills Junior High School**
**Bethlehem, Pa.**

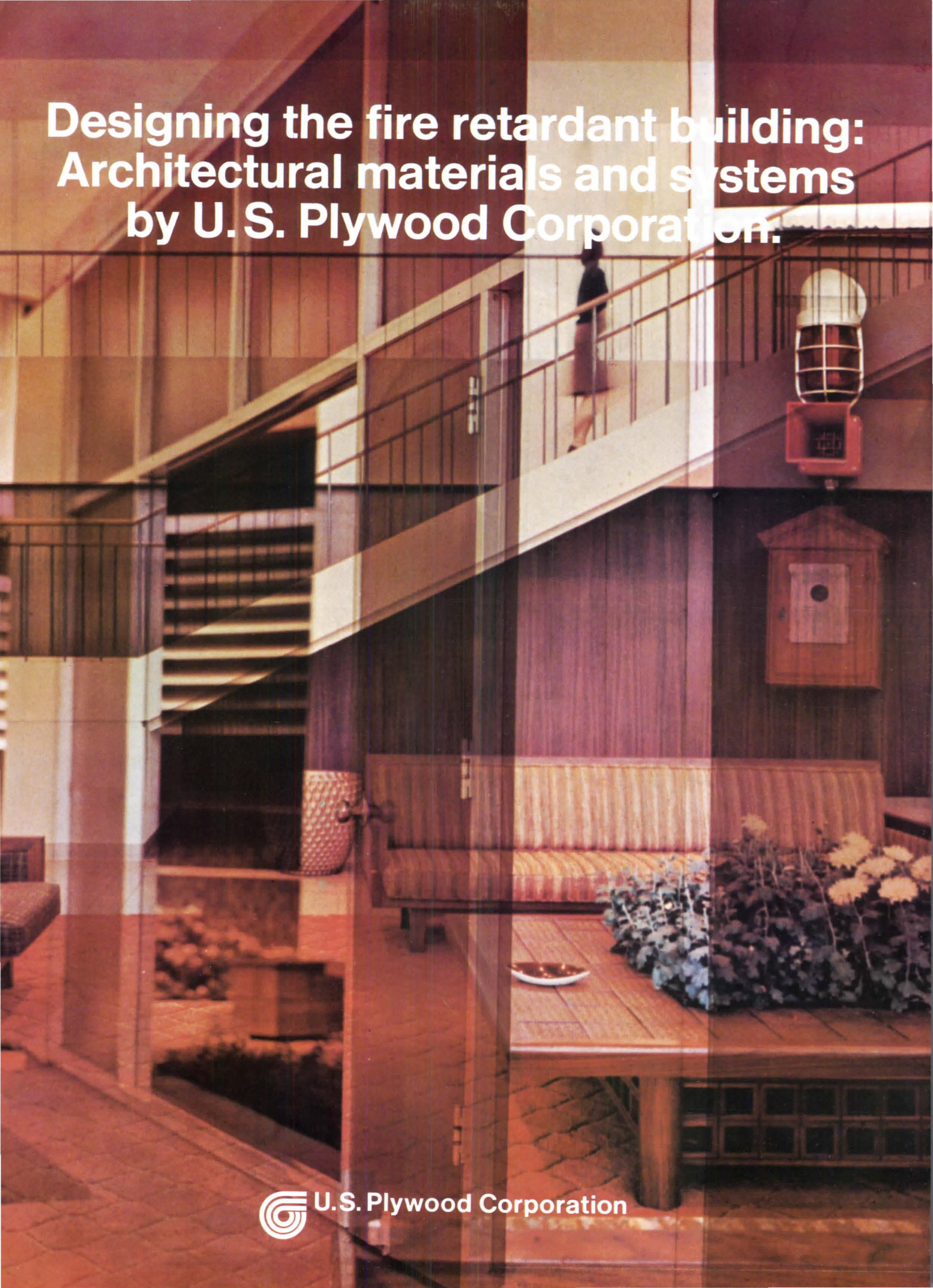
Steel framing in the roof structure gives this gymnasium completely column-free space below. Separated from the rest of the junior high school, the gymnasium is an attractive structure on its own. Folding doors inside increase the usefulness of the main floor.

Many advantages are yours when you build with steel: economy, freedom of design, adaptability to difficult sites, ease of future expansion both laterally and vertically, low maintenance over the years.

**BETHLEHEM STEEL**

BETHLEHEM STEEL CORPORATION, BETHLEHEM, PA.

# Designing the fire retardant building: Architectural materials and systems by U.S. Plywood Corporation.



U.S. Plywood Corporation

Do fire codes cramp your style?

Feel free to design an office lobby in rich, rare English brown oak architectural paneling. Or in avodire, zebrawood, paldao, teak, or walnut. Mix or match your grain patterns. Specify any finish of your choice, or choose from our clear Permagard® or colorful Permacolor® dry film finishes.

Work in a movable wall system if your requirements demand. Or use Flexwood® for wood paneling on a curved wall, or an extra tall or long one. With wood-faced doors, or vinyl, paint, or plastic-surfaced ones.

And let color—the permanent, weatherproof, flat inorganic color of Glasweld®—add impact and accent to your building exteriors.

Feel free. Then come to U. S. Plywood for the architectural materials and systems to execute your designs. We'll supply them and see that they comply with the particular building code having jurisdiction, wherever you're working.

So there. There's really no reason to let fire codes cramp your style.

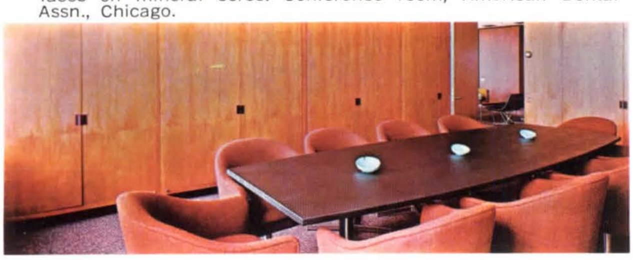
Weldwood 8′ 1″ fire doors with plain sliced American walnut faces and Weldrok® cores. Office of the president, Martin E. Segal & Co., Inc., New York. Arch: Van Summern & Weigold, N. Y. Inst: W. J. Barney Corporation, N. Y.

Glasweld window inserts. Robert Morris Junior College dormitory, Moon Township Campus, Pittsburgh, Penna. Architect: Tasso Katselas. Gen'l Cont: Navarro Corp., Pittsburgh. Inst: Columbia Architectural Metals Co., Pittsburgh.

Weldwood® teak faced mineral core movable walls and matching storage units. Reception area, American Dental Association, Chicago, Illinois. Architect: Graham, Anderson, Probst & White, Inc., Chicago. Inst: Woodwork Corporation of America, Chicago.

Blueprint matched Weldwood fire retardant architectural English brown oak paneling in lobby and auditorium of world headquarters of INTERPACE (International Pipe and Ceramics Corp.) Parsippany, N. J. Architects: Smith, Smith, Haines, Lundberg and Waehler, New York. Cont: White Construction Co. Inst: Schroeder Bros., Union, N. J.

Weldwood movable walls and storage units: book-matched teak faces on mineral cores. Conference room, American Dental Assn., Chicago.



**U.S. Plywood Corporation**

Zebrawood Flexwood, Executive House, Bronx, N. Y. Des: Emily Malino Associates, New York. Inst: Kalflex, Inc., New York.

# Specification details of Architectural materials and systems by U. S. Plywood Corporation

Name ____________________

Firm ____________________

Title ____________________

Address ____________________

City ____________ State ____________ Zip Code ____________

| | |
|---|---|
| 1. | 6. |
| 2. | 7. |
| 3. | 8. |
| 4. | 9. |
| 5. | 10. |

For complete information on U. S. Plywood architectural materials, with fire ratings to qualify for building code requirements, you need only telephone your nearest U. S. Plywood Corporation branch. One of our Architect's Service Representatives will be happy to work with you, help you analyze your requirements, and offer samples for your inspection. Or if you prefer, just circle the appropriate number for data booklets listed below and mail this coupon to:

**U. S. Plywood Corporation, Dept. PA 10-66, 777 Third Avenue, New York, N. Y. 10017**

**1. Weldwood® architectural doors:** Information on a complete line of standard construction doors and special purpose construction doors, factory finishing, fitting, machining, detailing, facings, guarantees.

**2. Weldwood architectural paneling:** Specifications and grades, veneer selection and matching, cores, finishes, coordinated products.

**3. Weldwood prefinished paneling:** Specification information, grade description, recommended installation and design usage for the full line of prefinished woods.

**4. Weldwood guaranteed sidings:** Specifications, features and variety of designs, finishes, installation details, guarantees for a full line of sidings.

**5. Weldwood Novoply®:** Including fire retardant Novoply, engineering details, suggested usage and machining, installation details, edge and joint treatment for a quality 3-ply particle laminate board.

**6. Weldwood Movable Walls and partitions:** Design and structural specifications, maintenance and cost studies for a variety of both standard and custom designed wall systems.

**7. Micarta®:** Technical and application information, color selection, for high-pressure decorative laminates made by Westinghouse, distributed by U. S. Plywood Corporation.

**8. Glasweld®:** Description of properties, color and pattern choice, installation suggestions and examples, guarantee, and specifications for an exterior grade inorganic panel with a permanent finish.

**9. Weldwood Flexwood®:** Wood selections, dimensions, fire rating specifications, and installation details for a completely flexible wood veneer and backing applicable to almost all surfaces, curved and flat.

**10. Weldwood preservatives and finishes:** Product and specialized use description for Weldwood preservatives (Woodlife®, Penta®, Stormy Weather®, Rainchek®, and Woodhealth®) and Weldwood finishes (Color Tones®, Deep Finish Firzite®, P.A.R.®, Patiolife®, Satinlac® and White Firzite®).

Weldwood architectural paneling in a variety of fire retardant constructions offer the architect unlimited freedom in designing natural wood and colorfully prefinished walls. Constructions include ¼", ¾", and 1" panels with mineral cores for Class I requirements (0-25 flame spread) and treated wood cores for Class II (26-75 flame spread) and Class III (76-200 flame spread) installations. Dry film Permagard® and Permacolor® as well as custom wet finishes may be specified.

Weldwood movable walls are offered in 5 different systems that permit the architect to select faces from a full range of domestic and exotic architectural hardwoods produced on fire-rated Weldrok® core. These are approved by the Board of Standards and Appeals for use in New York City. Also approved by the Uniform Building Code. Wet or dry film finishes may be applied at the factory. High-pressure laminate, paint, and vinyl surfaces are also available.

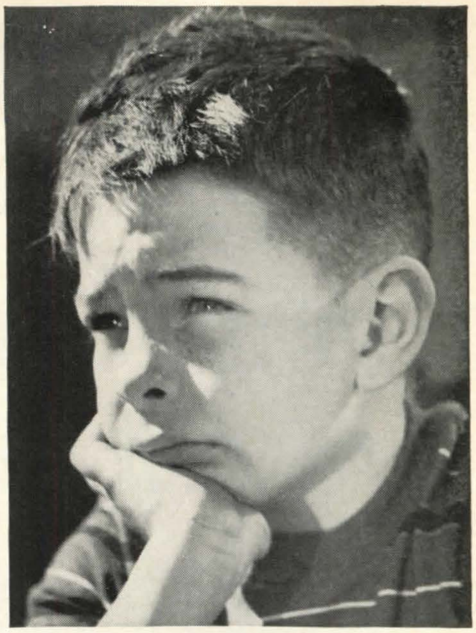
Weldwood fire doors are hardwood and plastic laminate faced for Class II and Class III openings. They are labeled by Underwriter's Laboratories, Inc., for 1½-hour, 1-hour, and ¾-hour. Doors can be supplied premachined for hardware, pre-sized for the opening, and prefinished in either wet or dry film finishes to meet your requirements.

Glasweld is an exterior grade, steam-cured, asbestos-reinforced, incombustible panel with a permanent all-mineral enamel coating. It is available in 24 standard colors. It is strong, weatherproof, economical to install, and requires a minimum of maintenance.

Flexwood is fabric-backed veneer available in more than 80 of the world's most desirable woods. Applied to an incombustible surface such as plaster, it requires no fireproofing. The use of Flexwood is permitted without restriction by the Administrative Building Code of New York City under provision C26-667.7b and C26-721.0b and approved by the Board of Standards and Appeals under Calendar #637-49-SM.


**U.S. Plywood Corporation**

# Multiply Billy Edwards by 48,800,000



## *to measure*
## *the challenge of school construction*

Figures on school enrollment are only part of the picture.* Education today is a living, changing thing. The idea is to equip Billy Edwards for *his own future*—not for his parents' past.

Doing this job calls for new concepts in school design—concepts made possible with *prestressed concrete.* Teaching space must be quickly changeable in size and shape. A gymnasium this evening may be four lecture halls tomorrow morning. The *most adaptable* schoolhouse is the *best schoolhouse* since education must meet changing needs and accommodate sophisticated teaching aids *with multi-purpose space.*

Now, school planners bring wide-open spaces *inside* as the long-span muscle of prestressed concrete invites them to forget about space-wasting columns. At the same time, this truly 20th century material points the way to impressive economies in speedily erected, fire-safe, quality schools.

See your local PCI member for details on the use of prestressed concrete in schools.

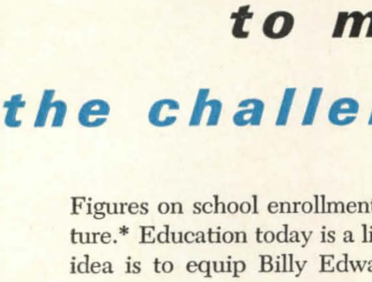
*Send for your free copy of "PRESTRESSED CONCRETE—applications and advantages" and selected literature on prestressed concrete in schools.*

**PRESTRESSED CONCRETE INSTITUTE** PCI

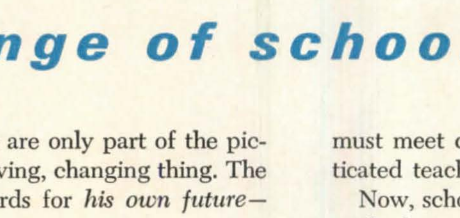
205 WEST WACKER DRIVE • CHICAGO, ILL. 60606

ARCHITECTURAL STRUCTURAL

* Public and private school enrollment, first twelve grades, 1965—1966 school year, is 48,800,000. Enrollment will increase 400,000 annually through 1975.—**U.S. Office of Education.**

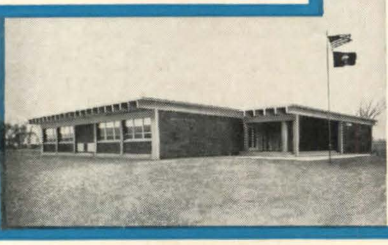


**UNIVERSITY OF CALIFORNIA**
Davis, California
**Architect:**
Gardner A. Dailey, FAIA, & Associates
**Engineer:**
T. Y. Lin, Kulka, Yang & Associate



**AMBASSADOR COLLEGE**
Pasadena, California
**Architect:** Peter J. Holdstock
**Engineer:** Johnson & Nielsen

**HENRICO HIGH SCHOOL**
Richmond, Virginia
**Architect:**
J. Henley Walker, Jr. AIA



**PARSONS RURAL ELEMENTARY SCHOOL**
near Salina, Kansas
**Architect & Engineer:**
Anderson—Johnson AIA

**ACADEMY OF THE HOLY ANGELS**
Demarest, New Jersey
**Architect & Engineer:**
J. G. Phelan and Associates



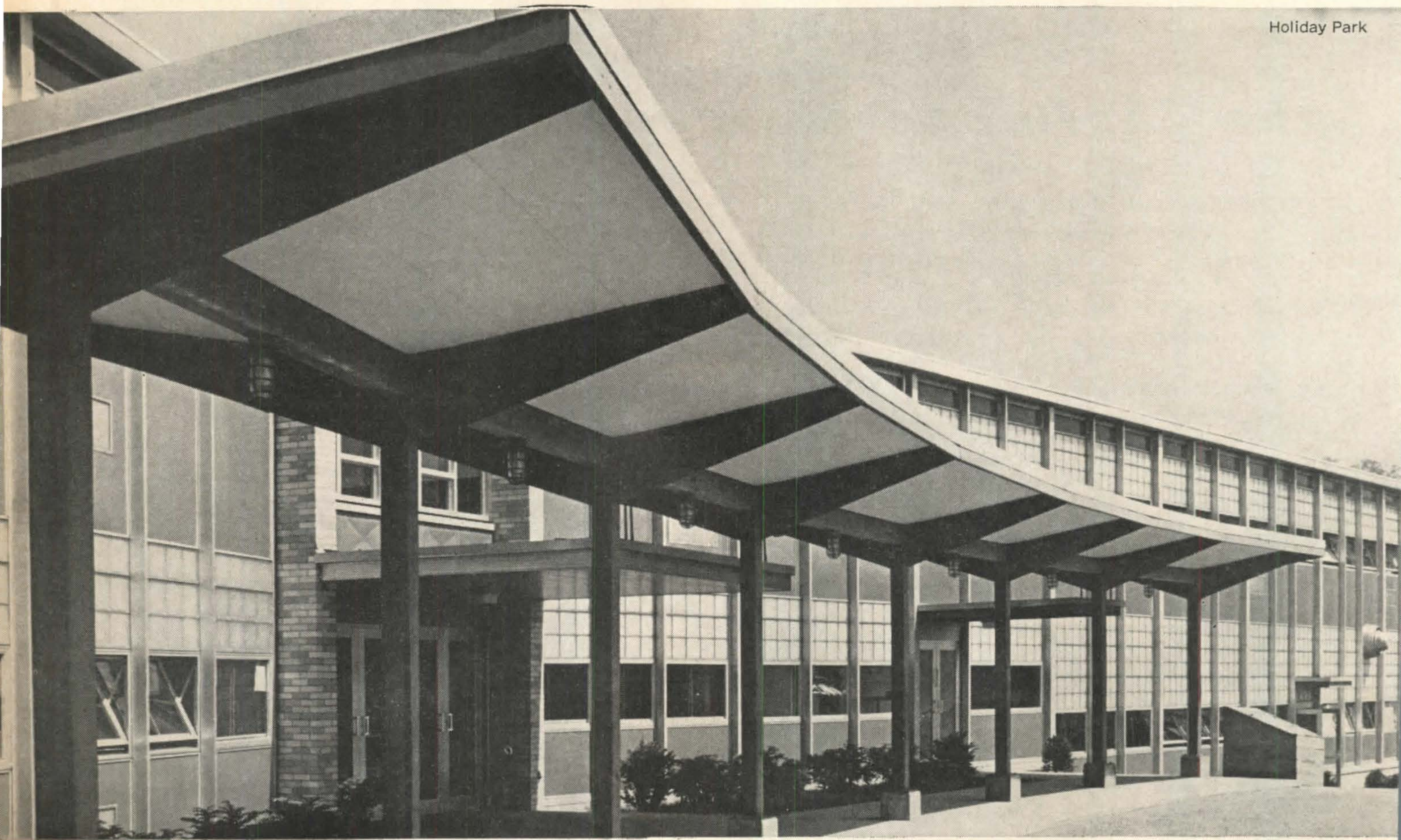
On Readers' Service Card, Circle No. 419



◄ On Readers' Service Card, Circle No. 445

# New facts on Gas vs. Electric Heat

# Eight Pennsylvania schools are bid both ways.


Holiday Park

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

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

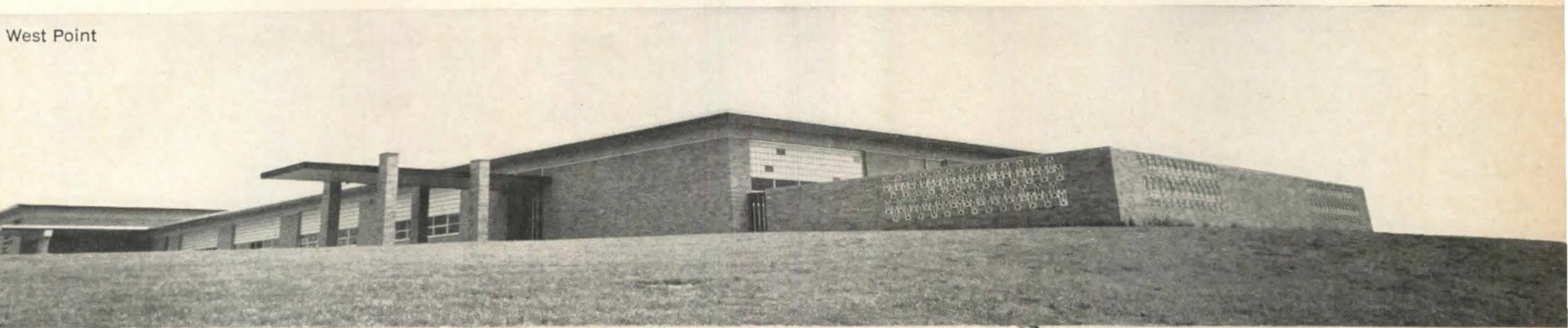
Interested in school heating costs? Now you have a double reason to consider Gas. Its economy has been proven, initially and over the long term. Your local Gas Company Sales Engineer can tell you the full story. See him soon.

AMERICAN GAS ASSOCIATION, INC.

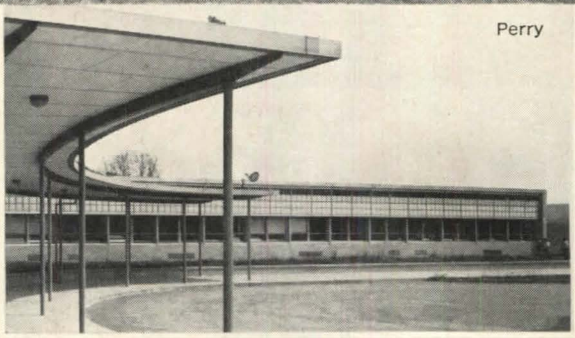
**For school heating...Gas makes the big difference**

On Readers' Service Card, Circle No. 327

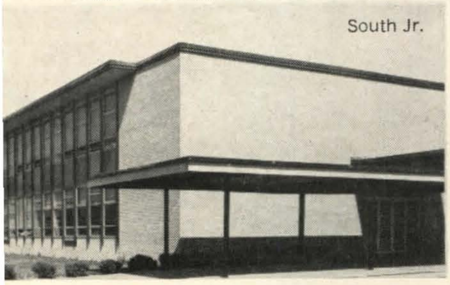
# Result:
# no basic difference in first costs. Gas heat is chosen for operating economy.


West Point

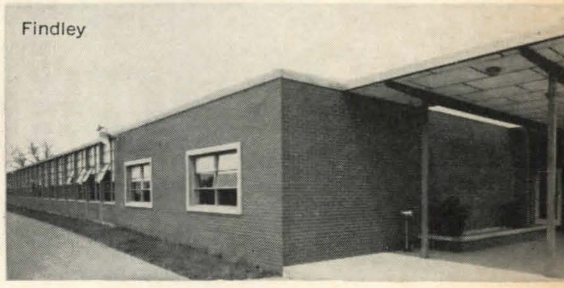

Fairless


Perry


South Franklin


South Jr.


Blaine-Buffalo


Findley

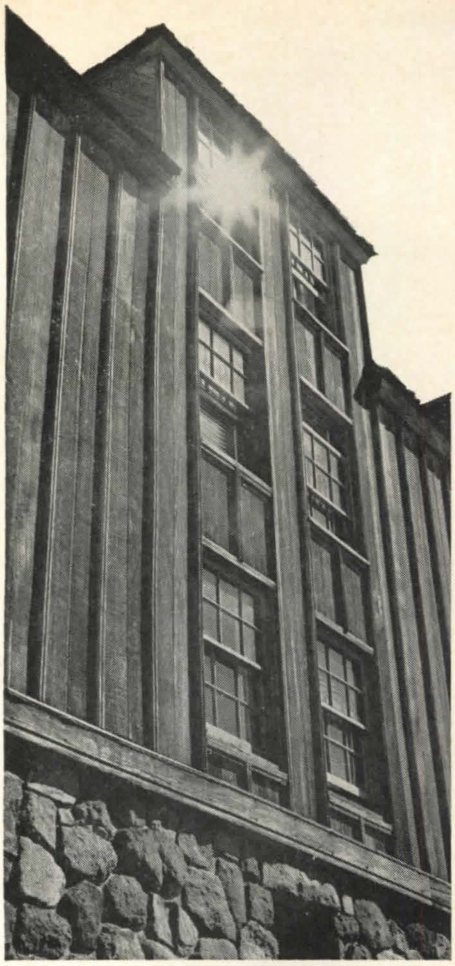
**TOTAL CONSTRUCTION BIDS**

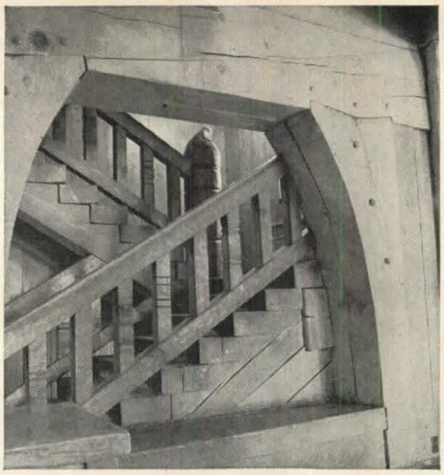
| Location, Name of School | Square Feet | Gas | Electric (Resistance) | Date of Bid | System Installed |
|---|---|---|---|---|---|
| Monroeville (South Jr.) | 104,000 | $1,580,700 | $1,636,300 | July '60 | Gas |
| Claysville (Findley) | 14,000 | 205,633 | 204,173 | July '59 | Gas |
| Claysville (Blaine-Buffalo)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

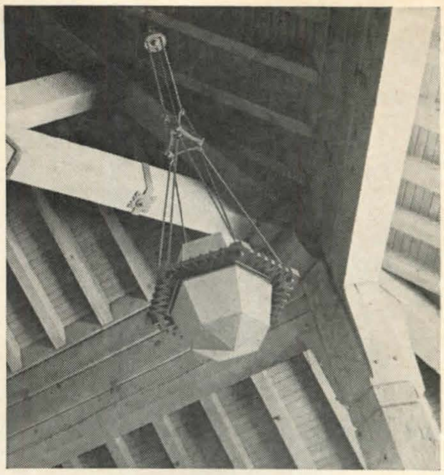
*Addition

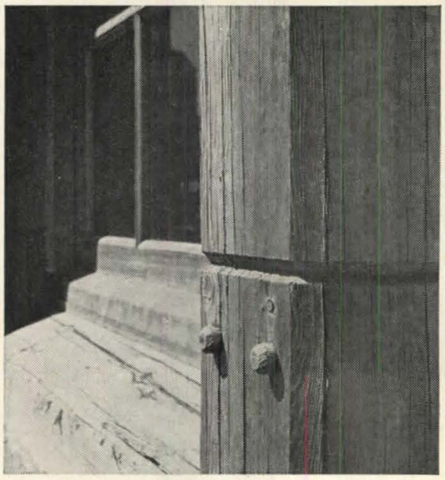
Timberline Lodge (left) sits at the 6,000-ft. level of Mt. Hood, about an hour from Portland, site of the 1968 A.I.A. National Convention. Winters are long and harsh. Its exterior board and batten (large picture right), the stairway (top center), the hand-hewn exterior columns (lower center), the interior beams above the main lobby (top right), and the hand-carved door (lower right) are all Western Wood Products. All suggest Timberline's massiveness and durability.

# Timberline Lodge has weathered 29 winters, 100-mile winds, 25 ft. snows, and 8½ million tourists.









It's easy to tell when wood's new. But try telling the age of old wood. Especially Western Woods. Like the Douglas Fir and Ponderosa Pine in Timberline Lodge.

A significant influence on Pacific Northwest architecture, Timberline is massive, graceful, compatible with its environment. And needs little maintenance.

Designed by a team of architects, the lodge was built in 1937 primarily of native woods and stone. It's the height of an eight-story building (96-ft.), has some 50,000 sq. ft. of floor space, and holds 173 guests plus staff. It also provides facilities for thousands of daily skiers, hikers and sightseers.

How has it held up?

Here's what A. P. DiBenedetto, Forest Service architect, Pacific Northwest Forest Range Experiment Station, Portland, Oregon, and the man responsible for maintaining Timberline's architectural continuity says:

"Sometimes I wonder if Timberline will ever wear out. Not that it never needs maintenance. It does. But it's surprising how little it needs when you consider that it wasn't designed for anything like the tourist traffic it gets."

What wears so well at Timberline is the Western Wood. There's quite a bit of it: 7-ton, hand-hewn columns of Ponderosa Pine; beams, purlins, decking, and exterior of Douglas Fir; knotty Ponderosa Pine paneling in the rooms.

And according to Mr. DiBenedetto, "As the years go by, the wood in Timberline grows richer in texture and color.

"Structurally, Timberline's interesting, too. Take the roof and ridge system. The whole thing deflects slightly under the heaviest snow loads. And as the snow melts, the roof line returns to its original position."

The lodge was designed by Project Architect William I. Turner, Linn A. Forrest, Dean E. R. Wright, and Howard L. Gifford. Ward W. Gano was Structural Engineer.

When you specify materials, consider the many advantages of Western Wood Products. Especially when you want durability. You can't be delicate and resist 29 winters on the slopes of 11,245-ft. Mt. Hood.

**Western Wood Products Association**

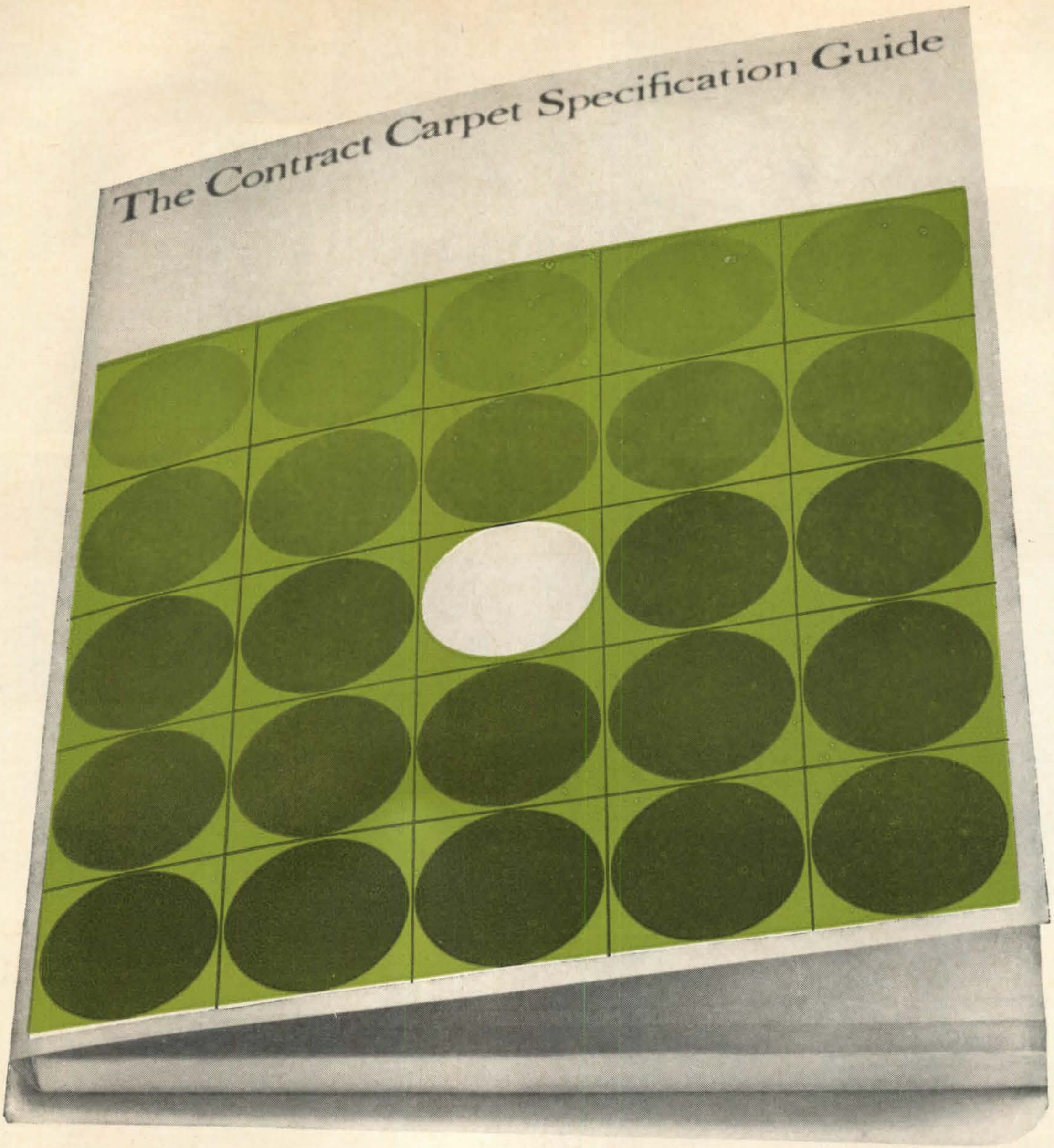
Portland, Oregon 97204

# You'd never know it.

A. P. DiBenedetto, Forest Service Architect,
Pacific Northwest Forest Range Experiment Station, Portland, Oregon.



On Readers' Service Card, Circle No. 449




# BALONEY-BUSTER

This Trend folder contains no flowery carpet words, no soft carpet sell.

It just gives you the straight scoop on contract carpet specifications like *pitch, gauge,* and *density*. It tells how they relate to the ultimate performance of the carpet. And explains why economic factors like tax depreciation may affect the type of carpet you specify. Naturally, we also include a few of our own carefully engineered specifications for your inspection.

Why do we want you to be fussy about specifications when a lot of other guys are just trying to sell you good-looking carpet? Because specification selling is what made us America's fifth largest carpet manufacturers in only five years.

When we get a chance to show you what we can deliver, and at what price, we almost always beat out the other guy. And if you think *that's* baloney just try us.

Trend Contract
DIV. OF TREND MILLS, INC.

**Trend Contract** P3
**295 Fifth Ave., New York, N. Y. 10016**
Please send me
*The Contract Carpet Specification Guide.*

Name__________

Title__________

Company__________

Address__________

City__________

State__________ Zip Code__________


How to make a GF chair uncomfortable
It's the only way we could think of. Because we spend most of our time designing comfort into them.
GF chairs are built and contoured to fit people —big, small, short, tall. Attention to detail doesn't end with design. We build the frame to last. We upholster GF chairs so that fabrics stay wrinkle-free and new-looking for years.
Some GF chairs are design award winners, but all offer the same degree of comfort and flawless workmanship. Why not stop in your local GF branch or dealer showroom and have a seat? Or write for descriptive literature to The General Fireproofing Company, Department PA-36, Youngstown, Ohio 44501.
GF
BUSINESS FURNITURE
On Readers' Service Card, Circle No. 365

# "We design 'ALL-AIR' systems for office buildings because . . .

". . . our experience on buildings of the American Management Association type indicate a savings up to 20% in the heating, ventilating, air conditioning contract when compared to the perimeter induction and interior air system" says S. E. Kallet, Chief Engineer and Associate of Sidney Barbanel, Consulting Engineers, New York City.

"Also, an overhead 'ALL-AIR' dual duct system supplemented with perimeter radiation provides many advantages for the owner, architect, tenant and mechanical engineer."

The *owner* benefits because:

> "The basic building first cost is lower with an 'ALL-AIR' overhead system throughout with supplemental radiation opposed to a perimeter induction unit system with an 'ALL-AIR interior zone which satisfies a basic prerequisite for the office building market."
>
> "We are able to design a base building heating, ventilating, air conditioning system with extreme flexibility."
>
> "Operating costs are saved by using 100% outside air for the intermediate seasons."
>
> "Maintenance costs are lower and the flexibility of a dual duct system permits owner to satisfy tenants with varying space usage."

The *architect* benefits from an aesthetic standpoint because there are no protruding perimeter units to interfere with interior space design or drapery arrangements.

The *tenant* is offered a wide choice of zoning, partition, and private office layout.

Mr. Kallet also says the Mechanical Engineer benefits because:

> "Adequate ventilation rate throughout is readily attained and noise control is easier to effect with a total air system."
>
> "From a load flexibility standpoint, the total 'ALL-AIR' system can handle any magnitude of load by simply introducing additional air."
>
> "Maximum design flexibility can be achieved for perimeter and interior since any individual space can have its own mixing box and thermostat."
>
> "And there is no problem meeting code requirements for conference rooms, meeting rooms, cafeterias in connection with supplying the proper quantities, etc., of outside air."

**For additional information on S. W. Barbanel's approach to the 'ALL-AIR' split-system, write Connor Engineering Corporation for "A Dual Duct Approach for Office Buildings." Danbury, Conn.**

CONNOR

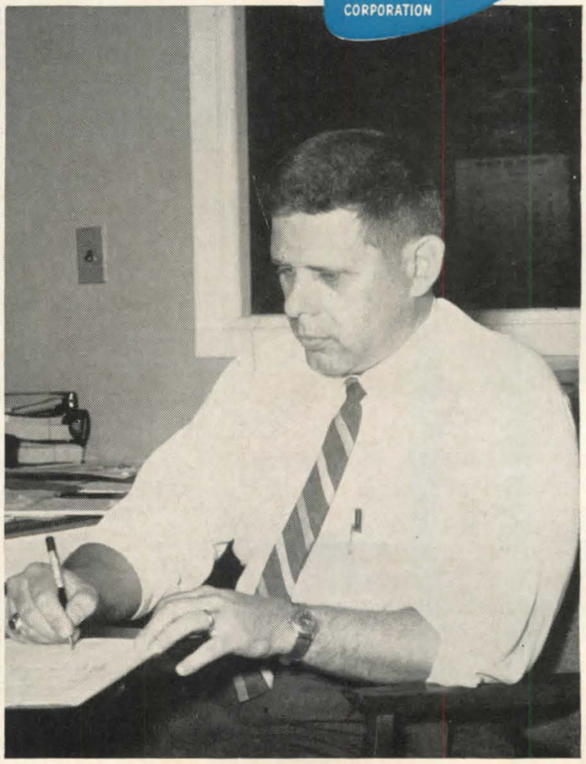
KNO-DRAFT® air diffusers

*Member of Air Diffusion Council*

CONNOR ENGINEERING CORPORATION

Emery Roth & Sons: Architect
Raisler Corp:, Mechanical Contractor

Sidney E. Kallet





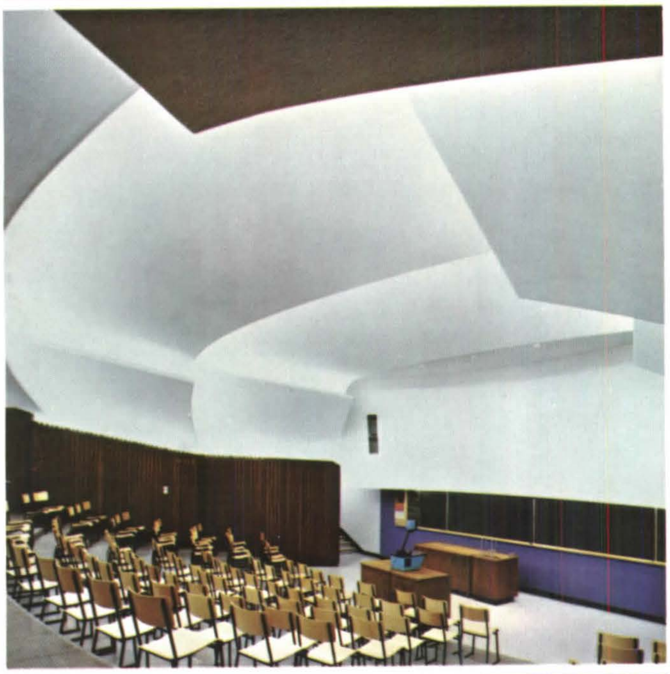
On Readers' Service Card, Circle No. 343



On Readers' Service Card, Circle No. 417 ➤

LIONS GATE HOSPITAL, North Vancouver, B. C. P&L products used: Vapex Wall Primer, Lyt-all Double Duty Primer, Lyt-all Stippling Eggshell, Vitralite Enamel Eggshell, Effecto Enamel, House Paint, Vapex Masonry Paint.

CARLSBAD PRIVATE HOSPITAL, LTD., Vancouver, B. C. Peter Cole, Vancouver, Architect. P&L products used: Primafil, Vapex Wall Primer, Lyt-all Double Duty Primer, Vitralite Enamel, Lyt-all Flowing Flat, Vapex Flat Wall Finish, Effecto Enamel, Tonetic Wood Stain, "38" Pale Trim Varnish, House Paint, Vapex Masonry Paint.



SIMON FRASER UNIVERSITY SCIENCE COMPLEX, Burnaby, B. C. Vancouver, Architect. P&L products used: Primafil, Vapex Wall Primer, Lyt-all Double Duty Primer, Lyt-all Stippling Eggshell, Vitralite Enamel Eggshell, Lyt-all Flowing Flat, Tonetic Wood Stain, "38" Pale Trim Varnish, Alkatite Cement & Stucco Paint.

RICHMOND SQUARE SHOPPING CENTRE, Richmond, B. C. Dundee Developments, Ltd., Developers; John H. Hanson, Vancouver, Architect. P&L products used: Primafil, Vapex Wall Primer, Vapex Flat Wall Finish, Effecto Enamel, Vapex Masonry Paint, Verdura, Exterior Rustic Stain.

# Pratt & Lambert Paint and Varnish... The Predominant Choice of Leading Architects

The extraordinary qualities of Pratt & Lambert products make them favorites with architects. Accurate, scientifically controlled and tested formulations yield paint and varnish which apply well, look attractive and last long on job after job.

Exclusive P&L Calibrated Colors® offer the architect ample choice. They are scientifically selected for their decorative correctness, both traditional and contemporary.

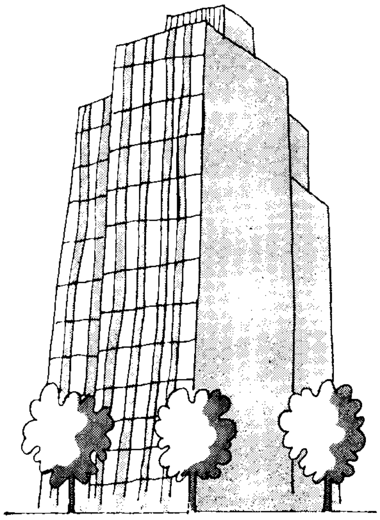
Pratt & Lambert Architectural Service Departments are eager and able to assist architects. They will offer recommendations for painting or finishing any interior or exterior surface, or develop a complete color plan for a building. Call or write your P&L representative or the Architectural Service Department nearest you. No obligation, of course.

**P&L ARCHITECTURAL SERVICE DEPARTMENTS**
**LONG ISLAND CITY, N. Y. 11101, 3301 38th Avenue**
**BUFFALO, N. Y. 14207, 75 Tonawanda Street**
**CHICAGO, ILL. 60632, 4900 South Kilbourn Avenue**
**ORANGE, CAL. 92669, 1405 North Batavia Street**
**FORT ERIE, ONTARIO, CANADA**


*Craftsmanship in the Package*

## Pratt & Lambert-Inc.

*Made and Sold Throughout All of North America*



# Is this in store for your new building– 15 years from now?


Statistically speaking, the average building needs to be remodeled at the tender age of 15. Tenant space requirements change constantly. Utilities demand renovation as they become more sophisticated. Office machines place new demands on the building. If your building isn't designed to accommodate basic structural and service changes, it can become obsolete almost overnight.

Anticipate change in the initial design by insisting on steel. Steel floors and columns can be beefed up to carry heavier loads. A steel frame can be modified to accept additional floors. New wiring and ductwork can be installed in steel floors and walls. Steel partitions can be moved to suit changing space requirements.

By contrast, it may be so expensive to alter some other types of construction that it frequently isn't worth the cost. Or a completely new building at much greater cost is the only way out.

A USS construction representative will be glad to detail how you can plan for change with steel. Contact him through our nearest sales office or write United States Steel, 525 William Penn Place, Pittsburgh, Pa. 15230.

**USS United States Steel: where the big idea is innovation**

TRADEMARK



On Readers' Service Card, Circle No. 452 ➤

# Beauty that Endures

*Lo-Tone Fissura Ventilating Ceiling Tile, a simulated travertine marble, adds to the beauty of this distinctive interior.*

**PROJECT:** *Chateau Louise Motel*
**LOCATION:** *Dundee, Illinois*
**ARCHITECT:** *Larsen-Wulff & Associates, Inc.*
**GENERAL CONTRACTOR:** *Moyle Construction Co.*
**ACOUSTICAL APPLICATOR:** *H. L. Wolf and Associates*

## Beauty that endures

***. . . combining classic design with effective air distribution throughout this restaurant***

*Selecting a ceiling to complement the beauty of this rich old English decor—while contributing to a modern air distribution system—was the challenge in this fine restaurant. The ceiling that met the need was Lo-Tone Fissura Ventilating Acoustical Tile—a classic pattern simulating travertine marble, and engineered to integrate with the heating and air conditioning system. Lo-Tone ventilating acoustical ceilings provide a balanced distribution of cooled or heated air. Unique controllable jet slots permit plenum pressures sufficient to propel air down into the room. Distribution of air is so uniform that drafts, temperature variations, air stratification, diffusers, even dirt-soiled areas are virtually eliminated. Because of high acoustical efficiency, the ceiling provides an elegant solution to noise problems, too. Sound is absorbed and sound transmission reduced with Lo-Tone acoustical ceilings. There is, in fact, hardly a ceiling problem that can't be solved with Lo-Tone products. Lo-Tone ceilings are available in Class A, non-combustible and FR (Fire-Rated) types. When used as a component of approved structural design, FR types have a listed U.L. fire rating—protecting against flame passage and heat transmission. They often provide economy by eliminating the need for intermediate fire protection above the ceiling. Still other Lo-Tone ceilings are vinyl coated for washability—an important feature in clean-room areas, computer rooms, laboratories and kitchens. Lighting products are easily integrated with Lo-Tone ceilings. A variety of CONWED translucent panels and lighting fixtures will meet most design and installation requirements for the ceiling you select.*

FISSURA

*Ceiling solutions come easy with Lo-Tone products.* For full facts and ideas, see AIA File No. 39-B in Sweets. Product samples are available from your local Lo-Tone Acoustical Contractor. Consult the Yellow Pages or write Wood Conversion Company, St. Paul, Minnesota 55101.*

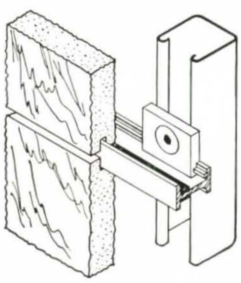
**International Testing Laboratories, a subsidiary of Wood Conversion Company, can help you with any acoustical evaluations you may require. Write for details of facilities, equipment and rates.*

**Lo-Tone® ceilings Conwed™ products**

# REMODEL WITH MARBLE AND SAVE

## with the new Zibell system for anchoring thin veneers

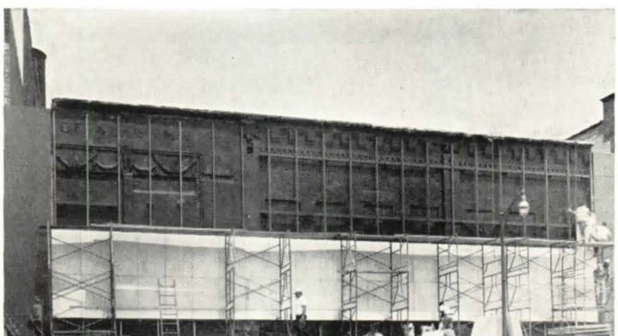
A unique arrangement of metal struts and special fastenings that provide support and anchoring for marble as thin as ⅞", creating a weather-proof wall with or without structural back-up. That's the Zibell System — for interiors and exteriors, for remodeling or new construction. It offers

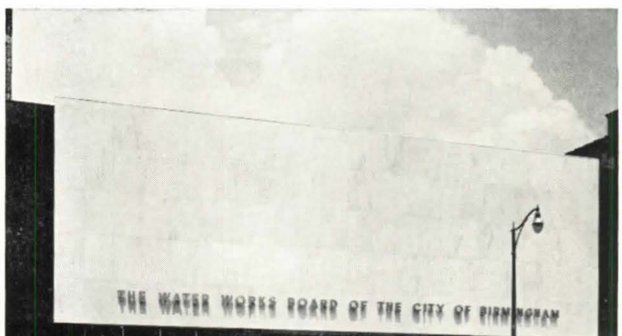


substantial economies in construction and affords the architect new design freedom in working with marble, the finest of all facing materials. May we send you the complete details?

**WRITE FOR OUR NEW BROCHURE ON THE ZIBELL ANCHORING SYSTEM**

ROBERT P. BYRAM, Architect





In remodeling work, the Zibell struts simply bridge over the projections and recesses in the old wall, obviating much costly remedial work. A Zibell installation is comparatively light which can be critically important in remodeling old structures whose footings and *walls might not support* the weight of many of the other popular facing materials.

COAST TO COAST CONSULTING SERVICE
Our staff of engineers stands ready to assist you on any project involving the use of marble or limestone. A phone call will put one of our men across the desk from you in a few hours.

The GEORGIA MARBLE® Company

11 Pryor Street, S.W., Atlanta, Georgia 30303

Designer: Pietro Belluschi in collaboration with George M. Ewing Company, Architect
Construction Management: Turner Construction Company (Rohm and Haas served as its own general contractor)

## You might have to play the waiting game for a taxi, your laundry, or a haircut.

## But not for Haughton Computer-Controlled Elevators at the Rohm and Haas Building.

There's no "hurry up and wait" for elevator service at Philadelphia's magnificent new Rohm and Haas Building. The fully-automated Haughton elevators feature Haughton solid-state electronic computer control. It puts cars where the people are. On the double.

Precision electronic systems constantly monitor building traffic from top to bottom, and dispatch cars on a regulated basis to meet traffic needs at any moment of the day or night. Even during rush hours, when demand for service peaks, calls are answered with incredible speed.

The unique Haughton electronic control system is an advanced development of our continuing program in Elevonics.* Let us show you how it can improve service, save time for tenants and visitors, and cut elevator costs.

Your Haughton representative will gladly assist you with design counsel, technical advice or any information you might need in planning new buildings or modernizing existing ones. Call him soon, or write us for complete information.

**Haughton's advanced program in systems research and engineering, with specific emphasis on the creative application of electronic devices and instrumentation for betterment of systems design and performance. Reg. U. S. Patent Office.*

**HAUGHTON ELEVATOR COMPANY**
DIVISION OF TOLEDO SCALE CORPORATION, TOLEDO, OHIO 43609

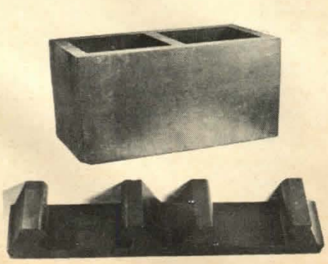
# P/A NEWS REPORT

*Progressive Architecture's Monthly Digest of Buildings, Projects, People and Products* *October 1966*

## CHAGALL MURALS STEAL SHOW AT MET

NEW YORK, N.Y. As opening-night patrons entered the new Metropolitan Opera House at Lincoln Center (see this month's P/A OBSERVER), they had two things to look at besides other patrons: to the right of what is called the grand staircase, above a restaurant area, is "Les Sources de la Musique" (above), a 30′ x 36′ mural painted by Marc Chagall; to the left, over the bar, is his "Le Triomphe de la Musique." Unfortunately, because of the narrow space, these can be seen only by craning one's neck, and then only in distortion. It matters little, for with their bright colors and movement they lend joy to a building that needs it. Writing in *The New York Times,* art critic John Canaday commented that apparently those who commissioned the murals were more interested in Chagall, who is now 80, than in what he would paint. "Chagall in return has given them an excellent summary of his virtues," wrote Canaday. "If he has repeated himself, it makes little difference. Few people have anything so agreeable to repeat, and virtually none of us who have anything to repeat will still be repeating it so happily when we are octogenarians."

## EARTH BUILDING-BLOCKS COULD LEAD TO NEW CONSTRUCTION ERA



Building-blocks made from common soil with petroleum asphalt binders may eventually have far-reaching repercussions in the building industry. According to the developers, the Esso Research and Engineering Company, the blocks will cost from 2¢ to 5¢ less than comparable concrete blocks.

The bulk of their raw material is available practically anywhere, in unlimited quantities, since, according to company estimates, one-third of the earth's surface and subsurface soils are suitable as raw material. The earth is prepared by blending, grinding, and heating. Binder and additive are also heated, then mixed with the earth. Esso claims that the structural qualities, freeze-thaw properties, and moisture absorption of their blocks are comparable to those of conventional materials. Its advantages include smooth surfaces and close tolerances that permit use of a special mortar. This mortar, a polyester-base, noncementitious adhesive, is more easily applied and can do the job with smaller quantities than conventional mortar. It can be applied with an ordinary paint-roller, and results in a fine, hair-line joint with a strength at least equal to the block itself. This technique results in substantial savings (up to 25¢ per sq ft, according to a company spokesman) in both labor and mortar costs. A conventional cementitious mortar with polymeric additives may also be used.

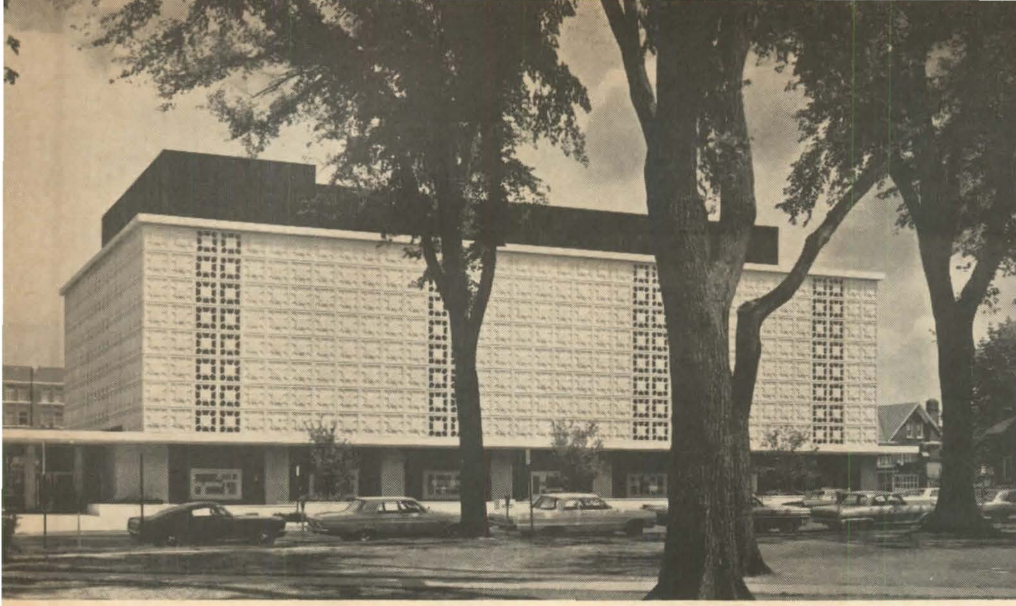
Blocks are compaction molded and heat-cured. The end product has an inherent black color, not unattractive, which, if the block is well made, will weather evenly to a slate gray. Surfaces require 50% less paint than porous concrete block, the company claims, and need only one coat of gypsum plaster.

Sayre & Fisher Company of Sayreville, N.J., is the first licensee and is producing market-development quantities of the new material. Already the Building Officials Conference of America has approved the block and mortar system.

Obviously, the impact of any new material is uncertain. This product has been tested for only five years. Taken at face value, it would seem a good substitute for masonry units. But perhaps the comparisons are not so clear-cut. In an attempt at clarification, one Esso spokesman told P/A, "Our material has limitations; so do all materials."

## PHILADELPHIA COURTHOUSE PLANS REVISED

PHILADELPHIA, PA. Arguments in the "City of Brotherly Love" grew heated over the design of the United States Courthouse and Federal Office Building (see p. 48, SEPTEMBER 1965 P/A). Jointly designed by the firms of Carroll, Grisdale & Van Alen; Stewart, Noble, Class & Partners; and Bellante & Clauss, the buildings are to be located on Independence Mall, only a block or so from Independence Hall. Detractors of the original design were both unanimous and correct in wanting the best possible building for the site. What they could not agree on was why the original design was faulty. Most of the dissent focused on two "ears" — small projections formed by courtrooms cantilevered



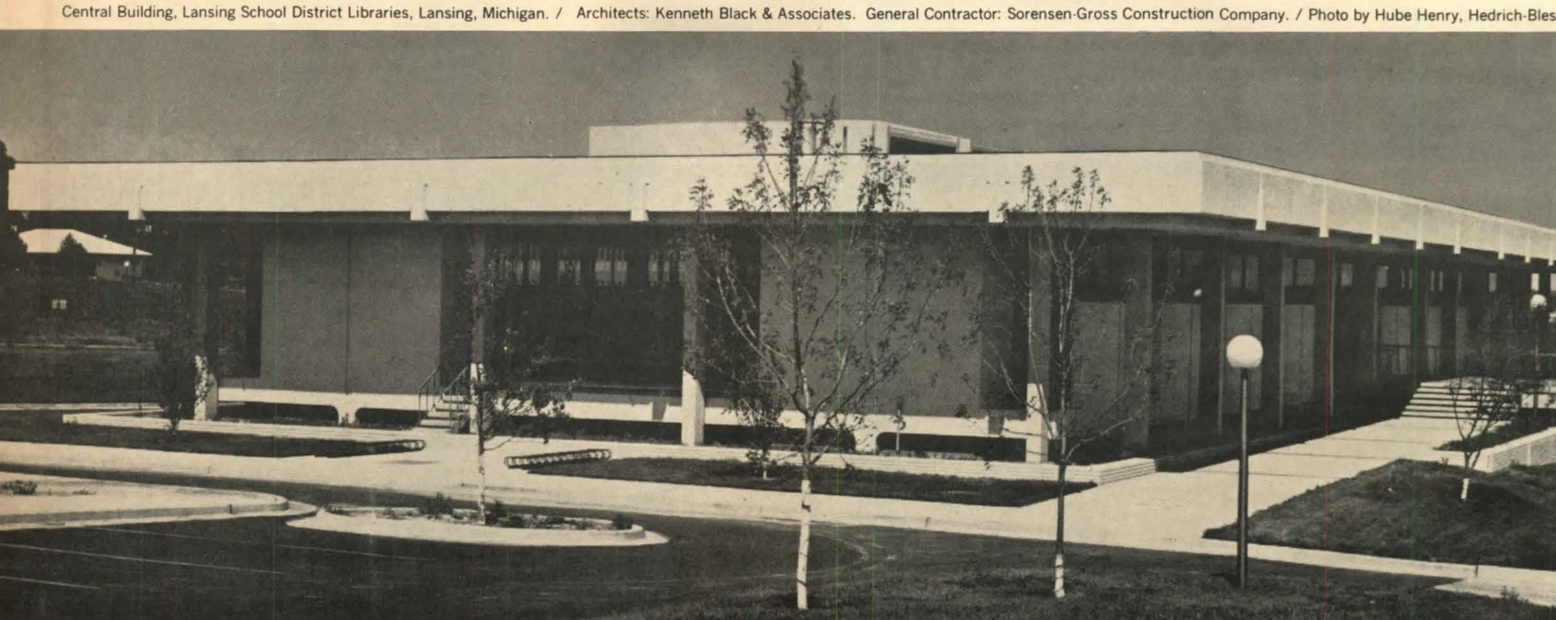
Swanson Public Library, Omaha, Nebraska. A.I.A. Merit Award winner. / Architects: Leo A. Daly Company. General Contractor: Peter Kiewit Sons Company. / Photo by Henry F. Kuehl.

## Look alikes? Hardly! But both are Mo-Sai® Libraries

The two example libraries shown here, both designed in Mo-Sai, are strikingly different . . .and evidence the design versatility of Mo-Sai. The Omaha library, winner of an A.I.A. merit award, used Mo-Sai panels with a white quartz aggregate in a warm buff matrix. On the Lansing library, colophons of eight contemporary American publishers were dimensionally reproduced in Mo-Sai. Where windows were desired, voids were cast into the Mo-Sai and plastic panels inserted directly into the units and backlighted for dramatic effect.

Every Mo-Sai unit is subjected to the most rigorous quality control inspection yet devised in this industry. By specifying **genuine Mo-Sai,** you take advantage of over 25 years of experience in producing the finest exposed aggregate concrete.

Central Building, Lansing School District Libraries, Lansing, Michigan. / Architects: Kenneth Black & Associates. General Contractor: Sorensen-Gross Construction Company. / Photo by Hube Henry, Hedrich-Bless



**Mo-Sai Institute, Inc.,** 110 Social Hall Ave., Salt Lake City, Utah 84111 Licensed Manufacturers

Mo-Sai®

PRECAST, PRESTRESSED CONCRETE
WITH EXPOSED AGGREGATE

BADGER CONCRETE CO.
Oshkosh, Wisconsin

BEER PRECAST CONCRETE, LTD.
Scarborough, Ontario, Canada

BUEHNER & CO., INC.
Mesa, Arizona

CAMBRIDGE CEMENT STONE CO.
Allston, Massachusetts

ECONOMY CAST STONE CO.
Richmond, Virginia

FORMIGLI SALES CO.
Philadelphia, Pennsylvania

GEORGE RACKLE & SONS CO.
Cleveland, Ohio

GOODSTONE MFG. CO., INC.
Rochester, New York

GRASSI AMERICAN CORP.
South San Francisco, California

HAMILTON CONCRETE PRODUCTS CO.
Chattanooga, Tennessee

HARTER CONCRETE PRODUCTS, INC.
Oklahoma City, Oklahoma

INTERNATIONAL PIPE & CERAMICS CO.
Pomona, California

JACKSON STONE COMPANY, INC.
Jackson, Mississippi

OLYMPIAN STONE CO., INC.
Seattle, Washington

OOLITE INDUSTRIES, INC.
Ojus Br., Miami, Florida

PLASTICRETE CORPORATION
Hamden, Connecticut

READY-TO-POUR CONCRETE CO.
Idaho Falls, Idaho

SEKIGAHARA STONE COMPANY, LTD.
Tokyo, Japan

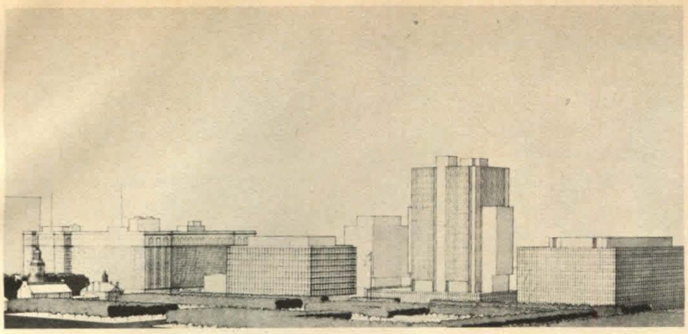
SOUTHERN CAST STONE CO., INC.
Knoxville, Tennessee

SUPERCRETE, LTD.
St. Boniface, Manitoba, Canada

TEXAS INDUSTRIES, INC.
Arlington, Texas

WILSON CONCRETE CO.
Red Oak, Iowa
South Omaha, Nebraska

On Readers' Service Card, Circle No. 401



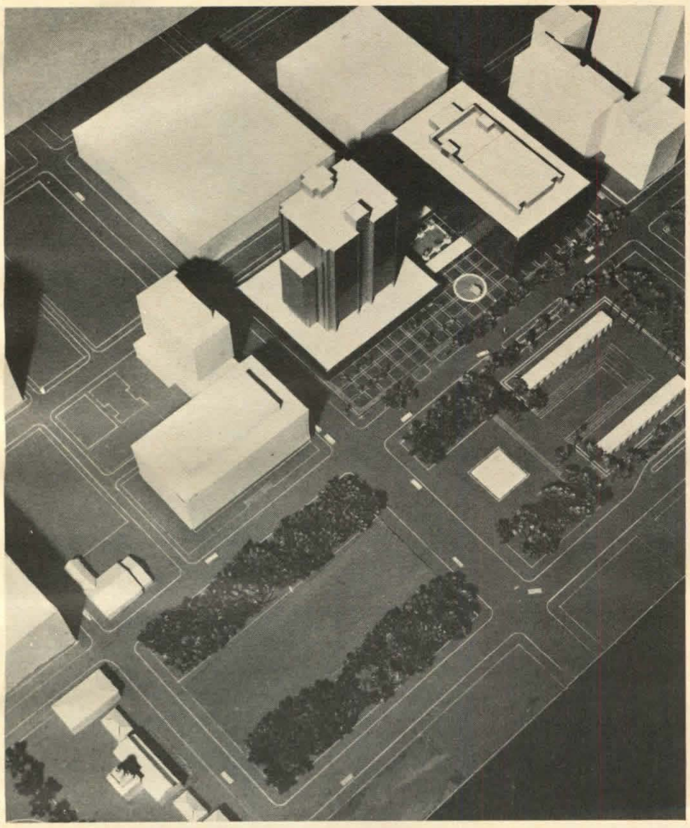


Photo: Jacob Stelman

from the building line on two sides of the courthouse.

Preserving the interior plan, which had been highly praised by the Justice Department, the architects submitted revisions both in the façade and site arrangement to the General Service Administration during the summer; the final design was accepted in August.

The building is noticeably improved by the revision. Not only is the façade cleaner and less massive, but the 10-story bulk of the Federal Office Building, linked to the 22-story courthouse tower by twin colonnaded walks, balances and offsets the 10-story Rohm & Hass building to the south along the Mall. The courthouse tower rises from a four-story base, which houses services such as the U.S. marshal's offices. It is set back 145′ from the street, and, because the site slopes gently about 4′ from Arch Street down to Market Street, a low wall surrounding the site was added, to help define the Federal Plaza. Although both buildings have curtain walls of bronzed steel and glass, the ground floors are walled in Colonial brick, and the courthouse has large, distinct vertical strips of brick. In a way, this ties it visually to the historic buildings in the area, and the tower provides a logical transition between the Rohm & Hass building and the Federal Office Building, lessening the impact of their combined masses.

The courthouse contains 20 district courtrooms, a ceremonial courtroom, three appeal courtrooms, a library, and 40 suites, which overlook the Mall, for the Federal judges. Beneath the plaza will be a parking area for 316 cars. Arriving by car, a judge can park and take an elevator, which delivers him to a private lobby and a corridor leading to his chambers.

Because of the controversy surrounding the early design, the GSA appointed a three-man panel to review the revised design. The panel, consisting of Arthur Gould Odell, Jr., James M. Hunter, and A. Grant Fordyce, was unanimous in its approval. Fordyce made this comment: "Seldom have I seen a design, which was a compromise of too many opinions, suddenly achieve an integrity all of its own. I believe that you now have a superior building. . . . This is a good demonstration of the integrity and persistence of the architects to solve the problem. . . . The relationship to the Mall is excellent."

According to the GSA, construction should begin in August 1967, with full occupancy expected in February 1970. In all, the 1,565,000-sq-ft project will cost a total of about $40 million.

## BILLBOARDS THRIVE ON CRITICISM

Almost nobody likes billboards except the people who own them and the people who advertise on them. That seems to be enough. In the face of mounting private and public criticism of billboards, the billboard industry announced a 3% increase in gross revenues so far this year. With a healthy income of $221,500,000 this year, the industry talks of preparing for lean years, as fear of increasing regulations mounts. Obviously nothing succeeds like unpopularity.

## COMMUNICATIONS / LECTURE HALL: NEW DIRECTION FOR MASS EDUCATION

STONY BROOK, N.Y. Underway on the campus of the State University at Stony Brook is this lecture hall building, the first of a two-building complex that will also include a communications center. The two structures, both designed by Meathe Kessler & Associates of Grosse Point, Mich., will form a focal point for one section of the campus. They are part of a continuing State University expansion program that will spend a projected total of $1,300,000,000 on 31 sites throughout New York State.

The lecture hall building, and 12 somewhat similar accommodations on other campuses (the first is being used this fall at the University at Buffalo), are the outgrowth of a study on classrooms done by Allen Green and Morton Gassman under a grant from the Ford Foundation's Educational Facilities Laboratory. It will contain 12 lecture halls and two classrooms, grouped, in this case, around a central lounge area, and will be used by all the academic disciplines located in this general area of the campus. Most of these rooms will contain windows for rear-projection movies or TV showings. When completed in 1968, 1300 students will be able to attend lectures at one time.

The building is a two-story, windowless, monolithic structure whose concrete base and walls were cast in place over a metal grid of repeated diamond patterns, which are nailed to wooden forms. Once the concrete had hardened, the grid was hammered out of the concrete, giving the façade a patterned texture.

The communications building, which will shortly go out for bids, will be connected to the lecture hall below grade. "Communications" as taught at Stony Brook will emphasize television. The building will house TV studios, darkrooms, and facilities for originating telecasts to be carried by closed circuit to other buildings on campus, and, eventually, to other campuses in the state system. Also included will be audio-visual studios and facilities for arranging and processing film strips and slide shows.

Within eight years' time, the State University expects a total student enrollment of between 184,000 and 260,000. Eleven thousand of these will be on the Stony Brook campus.

## MOTHER NATURE & THE AIA

Photo: "Paris Match"

WASHINGTON, D.C. Long live Mother Nature. Although touted in song and verse, the craftsmanship of Mother Nature has never been formally recognized by mankind in the only way mankind has of marking excellence and noting appreciation: the granting of a formal award.

To fill this gap, the AIA Committee on Institute Honors suggested to the Institute's Board of Directors that Mother Nature be given a Special Craftsmanship Award at the 1966 convention. It was an earnest proposal. But the AIA turned it down.

Speaking for the Committee, Seattle architect Fred Bassetti commented: "When we first thought of proposing Mother Nature, we considered it a joke, but the more we worked on it and collected examples, the more we decided it was serious and hoped the Board would rise to the occasion."

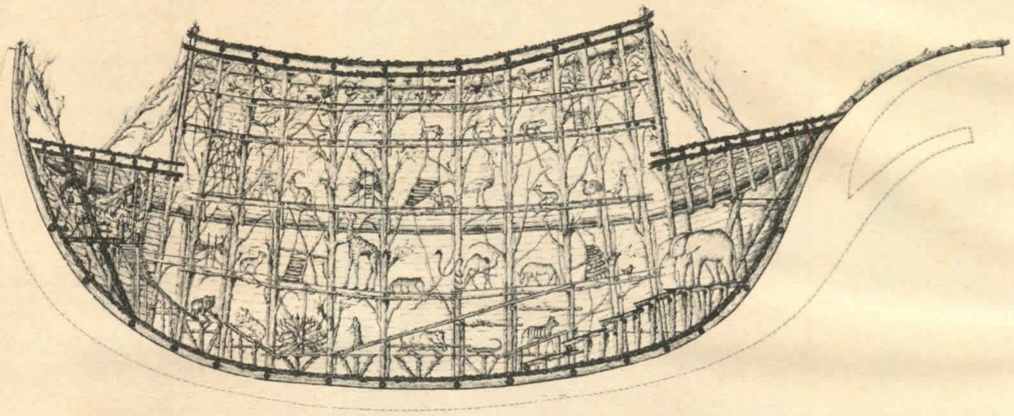
To support their case, the Committee submitted a brochure of color photographs illustrating the works of nature: birds, flowers, water, etc. And they suggested this citation:

*"For her myriad variety of works, unexcelled on earth, reflecting the various conditions of herself and life, responding to the sun and rain, infinite in detail, graceful in the toll of time, an inspiration to all those who call themselves craftsmen, indeed, to all those who call themselves alive, a craftsman unsurpassed, a giver bountiful beyond our capacity to ask;*

*"For the 1966 AIA Special Craftsman's Medal — Mother Nature. As proxy, this award will be accepted in person by Sophia Loren."*

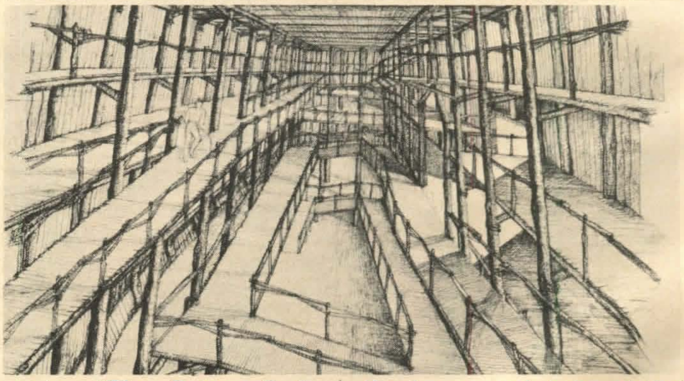
Giving awards to goddesses is, at best, a tricky thing; and while the Committee is to be commended more for its enthusiasm than for its practicality, no one can quarrel with its choice of the mortal to be the goddess's earthy representative. She would have added a heady note to the AIA convention. She is shown here climbing a ladder from the terrace of her Paris apartment.

## *ARK-ITECTURE*



HOLLYWOOD, CALIF. "And God said to Noah . . . 'Make yourself an ark of gopher wood; make rooms in the ark and cover it inside and out with pitch. This is how you are to make it: the length of the ark three hundred cubits, its breadth fifty cubits, and its height thirty cubits. Make a roof for the ark and finish it to a cubit above; and set the door of the ark in its side; make it with a lower, a second, and third decks.' "

The Lord was fairly specific in granting Noah one of the world's most prestigious commissions. But when 20th Century Fox set out to build a replica of the ark, for its film *The Bible,* which had its world premiére in New York on September 28, they were baffled; for no plans have survived the centuries. The ark they constructed adhered to the original only in spirit. Actually, five arks were built, the largest of these, measuring 200′ long, 64′ wide, and 50′ high, was put up on the back lot of the Rome studio of Dino De Laurentiis, the film's producer. These measurements made it less than half as long as the original, which measured 500′ long, 83′ wide, and 50′ high; Noah's ark was the largest ship built until the Germans launched the five-



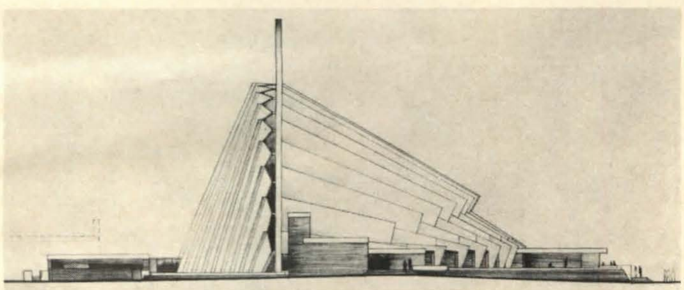
master "The Preussen" in 1902.

Art Director Mario Chiari, who has an architectural degree from the University of Florence, based his design of the ark on the pictures of the earliest boats found on friezes and tombs in the Middle East. But he conceived the ark as growing quite literally out of the leaves and trees of the forest in which it was built. And although it has gracefully curved lines, it is crudely built, because Noah had no experience as a shipbuilder.

The largest of the four smaller arks was built for interior shots. As Noah had been instructed, it was three stories high, with individual pens ("nests") for the animals. A great ramp circled the interior of the 68'-high model, so Noah and his family could tend their menagerie. Structured entirely of undressed tree trunks and limbs, its only concession to technology was a ceiling-high well with an automatic elevator, to lift director John Huston and his camera to any desired position. The whole effect is of a vast Piranesi interior come to life in wood.

In all, the ark cost almost $1 million, something Noah, whose work was for the love of God, would have little understood.

## MODERN PRAIRIE CATHEDRAL



ROCKFORD, ILL. So far, four years of design planning have gone into the proposed cathedral for the Rockford Diocese of the Roman Catholic Church. Most of the work has centered on the preparation of a plan that would fit the revised liturgy, and the architect — Brother Cajetan J. B. Baumann — and his staff have prepared a 15-page Liturgical Brief, developed from research into current and historic documents on church buildings.

Brother Cajetan's design gives the cathedral a strikingly contemporary facade, one which he thinks not only appropriate but mandatory. "A cathedral in any historic style, as was the custom until very recently, should be absolutely out of the question," he states. "No, not a Byzantine style, not a Gothic style, nor a Renaissance style, because these were the modern styles of their day — the 7th, 12th, and 15th Centuries. We are in the 20th Century and the church deserves better than a secondhand rehash of the great efforts of another century."

Located on a prominent, partly wooded site, the cathedral will open onto a broad atrium, thought of as an area of repose from which one enters. No roads will cut in front of it. Both to provide a distinct setting and to define the area clearly, the cathedral will be set on a low, pedestal-like platform. A series of steps lead into the low-ceilinged baptistry, which in turn opens onto the ambulatory and the major space of the church (some 96' at its highest point above the raised altar). Here, as Brother Cajetan points out, approximately 1400 parishioners can surround the "bishop in the midst of the church as he opens his mouth in speech and feeds his flock with teaching and with the Eucharist bread."

On the exterior, the church roof flows down from a central arch 135' high. Sixteen ribs of reinforced concrete will support the fluted roof elements, and both the concrete and the brick bearing walls will be exposed inside and out. Slanting to the ground behind the arch, the south wall will have 17 folds. A row of overhead windows surrounds the main section of the cathedral and a series of skylights are cut into each of the folds of the south wall.

Budget for the cathedral is $2 million. Raymond F. Pavia is associate architect.

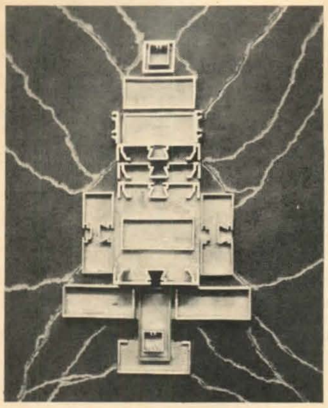
## *THE SEASON IS ART*

Photo: Still Photo Services

UNIVERSITY PARK, PA. Edward A. Adams, associate professor of art at the Pennsylvania State University, spent five years perfecting a wind structure — a tower of 81 polished aluminum rods arranged in two concentric circles, anchored at the base and open at the top. Although he has only a 12' model now, he envisions a wind tower rising 40' swaying in the breeze. "The idea of the wind structure occurred to me when I was asked by a church group to design a bell tower," Adams explains. "From the beginning, I felt that sound could inherently be a part of the tower, but it was not clear to me how it could be done." The sounds that come from Adams' tower would depend on the strength of the wind, and he is considering trying to control these sounds by varying the length of the tubes.

NEW YORK, N.Y. As a little girl, Ruth Maria Kilby was fascinated by light coming through bits of colored glass. She still is. But since about 1946, she has indulged this fascination by fashioning picture-sized paintings in fused glass. The photograph above, while showing some of the variations in texture and brightness seen in her creations, gives none of the depth and richness and, of course, none of the color. Working directly in glass, without the aid of preliminary sketches, she builds layer by layer, using a sometimes bewildering array of shapes and sizes — chunks of glass, strips of glass, sheets of glass, chips of glass, crushed glass. Although her early work was representational, mostly landscape, it is now entirely abstract. All pictures are backlighted. Her work is on display through October 22 at New York's Bodley Gallery.

NEW YORK, N.Y. Don S. Lewis is an art gallery owner in Norfolk, Va., who is also an artist. Last month, Manhattan's Galerie Internationale displayed a collection of Lewis' work. He works in structural materials — metal, plaster, concrete, wood — and gives many of his "cloutages," as he calls them, a patina of colored,



glossy plastic.

Shown here is a 19" x 26" cloutage, formed by embedding an arrangement of sliced aluminum castings in concrete. Lewis calls it "The Great Society" and says the aluminum sections form a Christmas tree. But it could just as well be a computer, or some other symbol of a mechanized society.

## ARCHITECTS' TOURS TO THE MIDDLE EAST

"Visit the cradle of our civilization," says the travel brochure. And that is what participants in the Architects Grand Air Treks will do during the fall and winter. The tours, whose itineraries will include Athens, Cairo, Beirut, Damascus, Jerusalem, Baghdad, Luxor, and Aswan, have scheduled departure dates of October 28 and December 16, 1966, and January 27, February 24, and March 31, 1967. United States Travel Agency, Inc., who are arranging the tours, points out that the trips have tax-deductible features for members of the architectural and construction fraternities, in that the tours include a visit to the Aswan High Dam and present the opportunities to meet architects in the various countries. Each touring group will be accompanied by an architectural historian. For further information write: United States Travel Agency Inc., 807 15th Street, N.W., Washington 5, D.C.

## COMMUNITY PLANNERS MUST REGISTER IN MICHIGAN

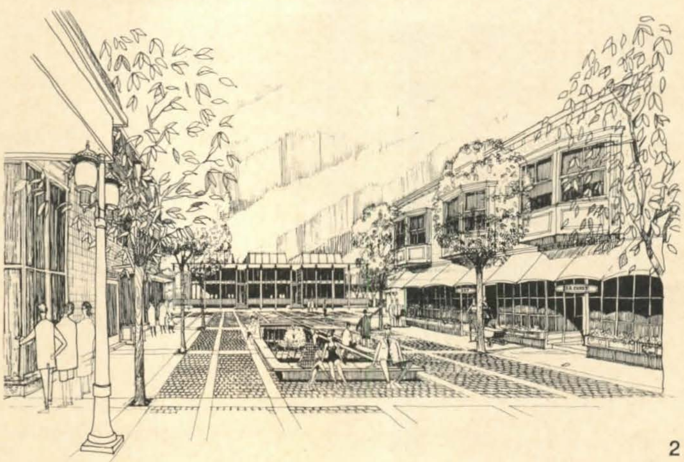
LANSING, MICH. During the summer, Michigan became the second state in the Union to require the registration of anyone who wishes to use the title of "Professional Community Planner" or "Community Planner." The Michigan law is not as tough as the one passed recently in New Jersey. For one thing, it does not prohibit anyone from doing planning work; he merely cannot use the title "Community Planner" without risking a fine of not more than $500 or up to 90 days in jail, or both. For another thing, although the law calls for a registration examination, anyone who has done planning work for six years (up to four of which may be accounted for by academic degrees) can register within the next two years without taking the exam. Furthermore, the act prohibits anyone registered as a community planner from practicing architecture, engineering, or land surveying unless registered.

## VICTORIAN RENAISSANCE

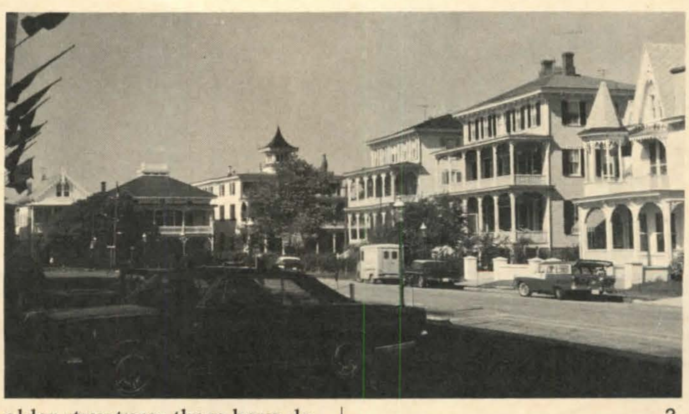
CAPE MAY, N.J. In 1960, the population of this small resort town on the Jersey coast was 4477. This was not much more than it had been 10 years earlier, and it has not changed much in the last six. But despite its lack of size, Cape May contains one of the largest assemblages of Victorian architecture in the U.S.

As early as the last part of the 19th Century it was a fashionable resort, but in the intervening years many of the older structures there have deteriorated sadly. The rundown house shown **(1)** was once a guest house for the Stockton Hotel, and in the 1890's rented for the season for $2000. When the hotel was torn down in 1910, these houses were sold to private owners, and are today in various states of repair.

1



2



3

Under a broad urban renewal program — the Victorian Village Renewal Project — initiated by concerned citizens and backed by the Federal Government, work is now underway weeding out buildings found structurally unsound and restoring buildings that have historical or architectural significance. All work follows a master plan drawn up by planning consultants Kendree & Shepherd of Philadelphia.

As a first step, the city's Urban Renewal Agency undertook several surveys. One reviewed the historical

4

significance of each structure in the area. Another investigated structural conditions, made suggestions about specific repairs, and estimated costs. Finally, families living in the area were consulted about preferences and finances, and sketches and floor plans were drawn to illustrate changes and detail costs.

When the project has been completed, one street will have been turned into a pedestrian mall, a new library will have been built **(2)**, parking will have been provided on the area's periphery, and many homes and several hotels will have been rehabilitated.

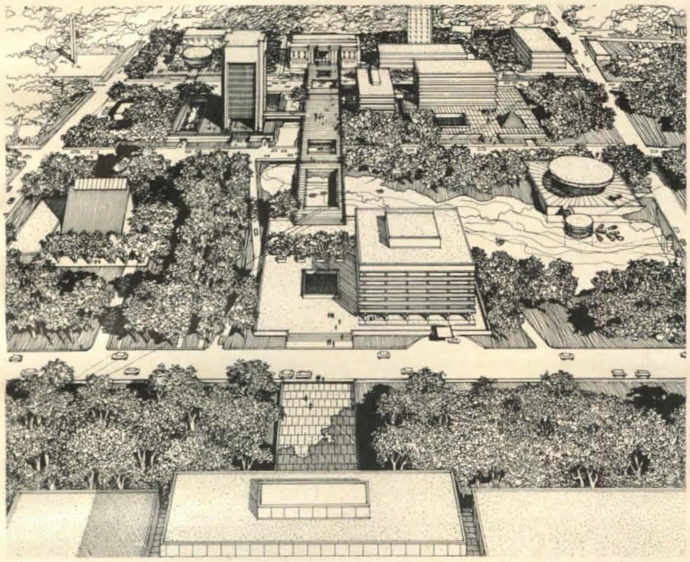
Already several homes have been restored **(3, 4)**, and a shopping center constructed on cleared land. A competition is also under way for a motel.

## OBITUARY

Carroll Louis Vanderslice Meeks, professor of architecture and art history at Yale University, died in late August in New Haven. He was 59. Meeks, who had degrees from both Yale and Harvard, spent his entire teaching career at Yale, and is credited with much of the development of the School of Art and Architecture there. He was an authority on the 17th and 19th Centuries, and the author of two books: *The Railroad Station* and *Italian Architecture, 1750–1914*. A past president and a director of the Society of Architectural Historians, Meeks was also chairman of the AIA's committee on the preservation of historic buildings.

A respected scholar, Meeks in recent years came to be thought of as the "Mr. Chipps" of the architectural department. In 1948, he studied in Europe on a Guggenheim Fellowship, and spent the academic year 1951-52 studying 19th-Century architecture in Italy.

## CHARLOTTE IS PRACTICAL ABOUT HER BEAUTY AIDES



CHARLOTTE, N.C. Like many cities its size, Charlotte, which had a population of slightly more than 200,000 in 1960, expects to double in size by 1985, and to approach a million by the turn of the century. Because of the foresight of the city-county governments and the planners who work with them, this growth will not be entirely haphazard. Back in 1958, the Charlotte-Mecklenburg Planning Commission selected a site adjacent to the existing City Hall and County Court House for a proposed Governmental Center. The site was largely run down, an area by-passed as the city expanded beyond it; today, these 60 acres have been cleared and graded, as a three-phase program for its development gets underway.

This program was prepared and is being coordinated by the Charlotte firm of J. N. Pease Associates. What will result, if the plan can be successfully guided through the vagaries of political change, will be an area that serves as a focal point for the city's expansion, an area almost as much park as a location for government buildings. In preparing their report, the planners worked with both the Redevelopment Commission of the City of Charlotte and with the Charlotte City Council and the Mecklenburg County Commissioners. These last two groups will implement the plan and provide funds for constructing the buildings. Each body will be responsible for the specific plans for buildings under their jurisdiction.

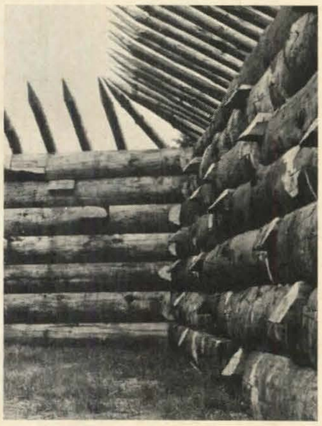
Briefly, the plan is this. During Phase I, already underway, a jail, a building for a law enforcement agency, and one for an education center will be completed. Date for their completion is 1970. Also by 1970, a raised pedestrian mall will be constructed, linking the County Court House to the north with a parking plaza to the south. According to the Pease plan, the roof of this south parking plaza would become a landscaped mall from which the Education Center would rise. However, the plan details none of the specifics of the buildings; these are left to the agencies who will own them and the architects they hire. In all, parking will be provided for 1500 cars. Streets in the area will be designated and constructed, and, perhaps most important, landscaping will be developed. It is hoped that a lake and two small ponds can be included; indeed, the plan will be drastically harmed if they are not. Feasibility studies on these have not yet been completed.

In Phase II, to be completed by 1985, a new city hall, an addition to the county office building, and a Federal-state office facility will be added. Germane to this phase is construction of a civic and cultural building, which would continue expansion of activities in the area and give it greater use at night. Finally, by the year 2000, a branch library will go up, a county office building addition will rise from the top of the east parking facility, and the landscaping, including paths and special plantings, will be completed.

As its final recommendation, J. N. Pease Associates call for the establishment of a Governmental Center Commission to establish definite guidelines and controls and see that they are followed. With this commission, which must have a vast store of architectural and civic awareness, will rest the future of the plan and perhaps of downtown Charlotte.

Working with J. N. Pease Associates on the project were Charles DuBose of Hartford, Conn., and Richard C. Bell of Raleigh, N.C.

## HERE COME THE TOURISTS!



PITTSBURGH, PA. A fort was probably the first structure you ever worked on. It was before you thought of becoming an architect or engineer. You were probably about five. Forts are beautiful in their simplicity. And they provide a sense of security.

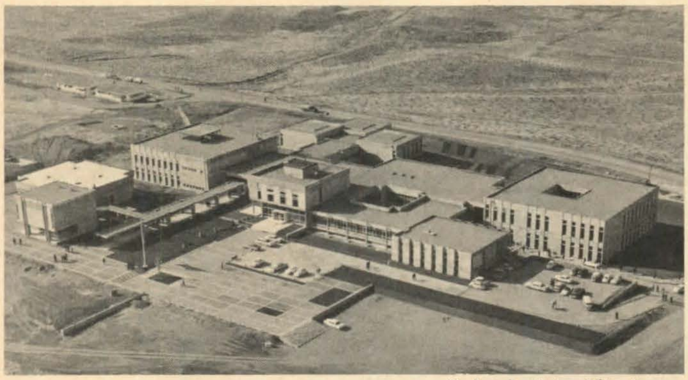
Architect Charles M. Stotz, of Stotz, Hess, & MacLachlan of Pittsburgh, is lucky enough to be working on a fort — or at least the reconstruction of one — right now. He has been since 1947.

Fort Ligonier was built in 1758, during the French and Indian War, as a depot or "post of passage" for the troops of British General John Forbes just before they attacked and took Fort Duquesne, on the present site of Pittsburgh. But by 1766, the wooden fort had suffered the ravages of weather and insects and had to be abandoned.

After archaeological and historical research, Stotz drew up plans for the fort's restoration, and a portion of the stockade was put up in 1953. Since then, Stotz has made two trips to England (in 1961 and 1965) to look for engineering drawings of the fort made in 1758. He found three sets, and work is now going on with virgin white pine timber, treated for preservation. Completion of the entire fort is scheduled for 1967.

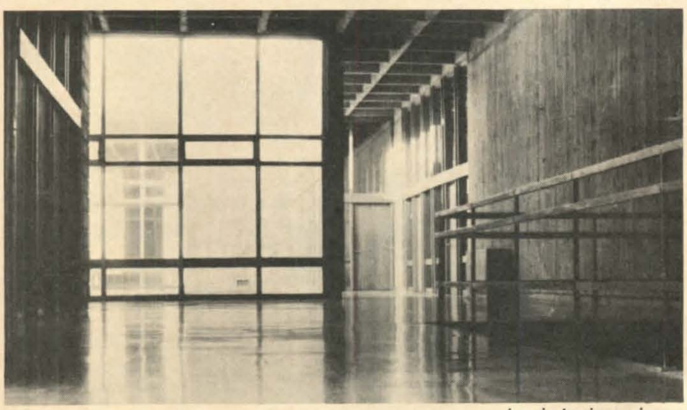
Paul Mitchell, a Latrobe, Pa., architect, is local representative for Stotz, Hess, & MacLachlan. The contractor is Moyher & Schultz.

## THE DESIGNING CINICIS



*School of Architecture.*

*The library wing.*



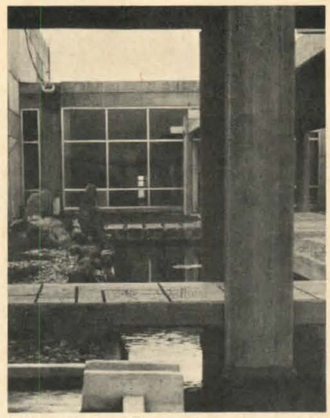
*An interior view.*

ANKARA, TURKEY. In 1923, when Kemal Ataturk, the founder of modern Turkey, made Ankara the capital of Turkey, it was a small town of about 25,000 persons, clustered around a fortress. It now has 800,000 inhabitants, who are more attuned to the theaters, concert halls, and opera in the city than to the citadel, which still stands above it.

With the construction of the Middle East Technical University on open land outside the city, Ankara gains a valuable cultural addition.

*An interior view.*

The University design stems from a 1961 competition won by a husband-and-wife architectural team, Altug and Behruz Cinici, who are supervising construction. One of several buildings now in use is the School of Architecture (shown), which provides classrooms, offices, library, and auditorium for 600 students and faculty. From any one point on the outside, it is im-



*View from the entrance courtyard.*

possible to read the building as a totality; it is a multi-faceted structure whose constituent parts and details only reveal themselves gradually as the viewer moves around it. On the interior, the floor plans consist of many cul-de-sacs sprouting from a central finger of courtyard, entrance hall, and faculty offices. Writing of the building, the German magazine *Baumeister* commented: "The construction of the School of Architecture is perhaps so interesting because here the additive principle has been carried much further than it was by Paul Rudolph in his architecture building at Yale University. There, too, the outer structure is a mountain of layers, cuts into the surface, etc., and the inner construction is equally labyrinthine, but a labyrinth made of a sequence of coherent rooms. On the contrary, in Ankara, single rooms hang on the end of this net of halls; everything works like a centrifugal system of dead ends connected to the outer world by the thin thread of the main entrance." Yet the plan in Ankara is much more logical than the one at Yale, the spaces more open, while being equally full of surprises; on the other hand, the exterior concrete work is less plastic, more repetitively rigid.

Behruz Cinici is a 34-year-old architect trained at the Technical University in Istanbul. His projects include shopping centers in Ankara and Istanbul, a business center, and two large office buildings. Although attracted by design rationalism, Cinici expresses himself in buildings that are far from static; and although his heritage is Eastern, his style is heartily Western.

## A PYLON TOO FREQUENT

Photo: Herbert Bruce Cross

GLENDALE, CALIF. Probably the most striking aspects of the recently completed Municipal Services Building here are the four massively spreading pylons that hold it 21′ above street level. At the same time, this stiltlike arrangement merely lets a passer-by see beneath the building to parking lots and streets beyond. The landscaped interior courtyard, which, with its elaborate fountain, might have alleviated this view, is sunken below grade. From a distance, the three upper levels, with their white concrete precast curtain wall panels, may be striking enough to hold one's attention. Taken by itself, it is a diverting building, and is especially appropriate in its striking design, for it will house city departments whose responsibilities include

building, engineering, planning, zoning, and public-works administration. Architects for the 55,000-sq-ft building were Merrill Baird and Albert C. Martin & Associates. Total cost was $1,800,000.

## ARCHITECT HERO OF TV SERIES

NEW YORK, N.Y. With the advent of the new television season, only one regularly scheduled series has an architect as its star. It is ABC's "Love on a Rooftop," starring Peter Deuel as the "apprentice architect" and Judy Carne as his pixie-like wife. In the opening episode, the architect meets his wife-to-be by dropping his ham sandwich from the second story of a construction job into her pocketbook ("Pardon me, you have my lunch"). Once married, they take up residence on the top floor of a San Francisco building, in an apartment with no windows. This lack of architectural perception is covered by a story line that ignores architecture and makes the "apprentice architect" into the earnest befuddled male that all TV husbands must be.

## AWARDS GO TO SEVEN MEDICAL CLINICS

Photo: Julius Schulman

SAN DIEGO, CALIF. Seven medical clinics were honored for their architecture last month in an awards program sponsored jointly by the AIA and the American Association of Medical Clinics. It was the first time such a program had been held; and because the building type — a structure designed for the group practice of at least seven physicians — is relatively new, medical clinics built in the U.S. since 1960 were eligible.

The McFarland Clinic in Ames, Iowa, won the only First Honor Award. It was designed by Crites & McConnell of Cedar Rapids for the group practice of 20 doctors. In part, the jury comment said: "The well-organized plan is particularly noteworthy for the efficient arrangement of the central core of laboratories and services with the offices and laboratories around the perimeter. Each office looks upon a private and pleasant terrace, which adds interest by light and shade to the exterior design."

Six other clinics received Awards of Merit. These are: the Kelsey-Leary Seybold Clinic in Houston, Texas, designed by Wilson, Morris, Crain & Anderson of Houston; the Samuell Clinic in Dallas, Texas, designed by Tie Davis–J. Murray Smith of Dallas; the Sunnyvale Medical Clinic of Sunnyvale, Calif., designed by William L. Carmen of Palo Alto, Calif.; the Lakeshore Medical Clinic of Kirkland, Wash., designed by Cummings & Martenson of Kirkland; Putnam Professional Park, Mahopac, N.Y., designed by Lee Harris Pomeroy of New York City; and the Community Health Foundation, Cleveland, Ohio, by Robert A. Little & George F. Dalton & Associates of Cleveland.

Jurors for the program were Charles M. Nes, Jr., AIA president; Francis D. Lethbridge, Washington, D.C. architect; and Dr. Bliss B. Clark, director of the New Britain (Conn.) General Hospital.

## SWENSON'S BODY SHOP

1

2

BATAVIA, N.Y. Part-time sculptor Joseph Swenson believes that form should be both functional and evocative. The larger-than-life-size, glass-fiber figures shown here are really pieces of furniture. Used as a chair **(1)** or a couch **(2),** Swenson figures his forms will fit a human being better than most conventional furniture does. They are, in addition, decorative, or at least eye-catching.

"What about comfort?" some old grouch might ask. Sitting on a glass-fiber form may not be as comfortable as sitting on, say, a live Rubens model. Swenson, who makes his chairs in his garage, acknowledges this comfort gap. He has plans for switching to foam rubber.

## P/A DESIGN AWARDS JURY MEETS

NEW YORK, N.Y. For two days, September 19 and 20, five jurors pored over 650 entries in P/A's Fourteenth Annual Design Awards Program. This year's jurors were: David Crane, Edward Dart, Sepp Firnkas, Charles Moore, and Joseph Passoneau. Award winners were notified immediately by wire. Results will be published in the JANUARY 1967 P/A.

## PERSONALITIES

The last two Presidential appointees to the top-level staff of HUD are **Don Hummel** and **H. Ralph Taylor,** Assistant Secretaries for Renewal and Housing Assistance, and Demonstrations and Intergovernmental Relations, respectively. Hummel's post covers loans for rehabilitation, housing for the aged and handicapped and college housing. He will also be responsible for urban and community improvement programs, relocation standards, and coordination of social service activity programs. Taylor will administer the Demonstration Cities program and coordinate comprehensive planning techniques, codes and zoning, training programs, and intergovernmental relations . . . **Charles Luckman** has been elected to the National Board of Governors of the Library of Presidential Papers in New York. The library, founded only last year, is intended to encourage young people to enter politics by making available to students all obtainable papers, books, films, and other types of material pertaining to U.S. Presidents, past and present. The privately supported

# Don't specify Gargoyles to do a RIGID-TEX® job

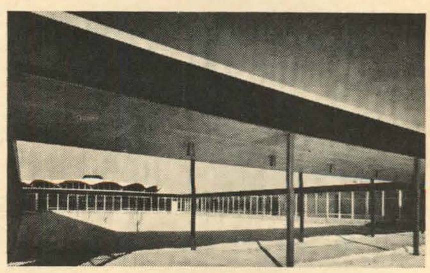
**For fascia, flashing, column and mullion covers** Reflection-flattening Rigid-tex stainless gives you protection against the elements that you can depend on . . . and its textured patterns provide decorative advantages as well.

Many otherwise beautiful buildings are being capped with materials that are as effective against wear and corrosion as a stone bird, and just about as handsome.

Rigid-tex stainless is resistant to corrosion and far less susceptible to vandalism than unrigidized stainless. We'll send you a 50-50 comparison sample. Take a nail and scratch its surface. Hold it in the sunlight. You'll see how much more mar-resistance and how much less glare Rigid-tex provides.

Lighter gauges are possible because Rigidizing strengthens the metal. Rigid-tex is easier to work with, therefore—fewer rejects in fabrication and installation. It can be color-coated, highlighted, and polished.

Consider Rigid-tex when specifying flashing and fascia . . . we'll be glad to do all your gargoyle work.



*For catalogs, and 50-50 sample, write:*

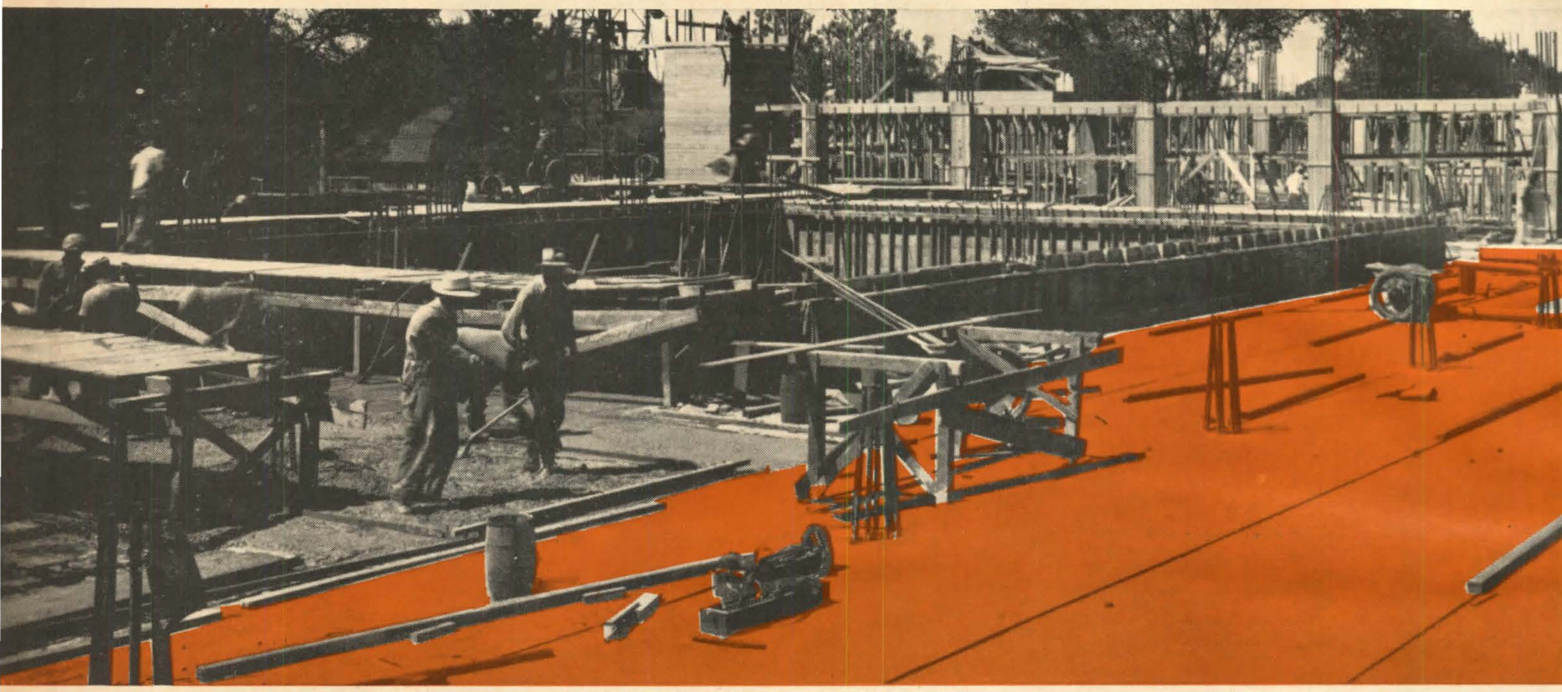
**RIGIDIZED METALS**

**688 Ohio Street • Buffalo, New York 14203**

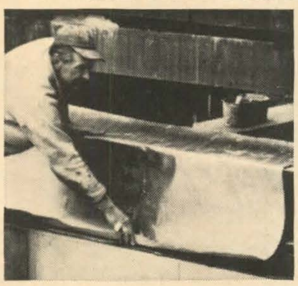
**Telephone 716-856-9060**

On Readers' Service Card, Circle No. 480

# Specify SISALKRAFT® CURING PAPER for new concrete because . . .



**SPECIFY THESE OTHER CONSTRUCTION PAPERS AND VAPOR BARRIERS FOR MAXIMUM PROTECTION IN CRITICAL BUILDING AREAS**



## Copper Armored Sisalkraft®

For concealed flashing with pure copper at 1/5th the cost of heavy copper:
COPPER ARMORED SISALKRAFT. A combination of electro-deposit copper and reinforced Sisalkraft that provides lifelong protection against moisture penetration at vulnerable points in the structure.

## Moistop®

To prevent moisture migration through concrete slabs:
MOISTOP. A six-ply barrier of reinforced Sisalkraft extrusion-coated with black polyethylene film. Moistop will not rip and tear like plain polyethylene film. Applied under concrete, Moistop helps keep floors dry.

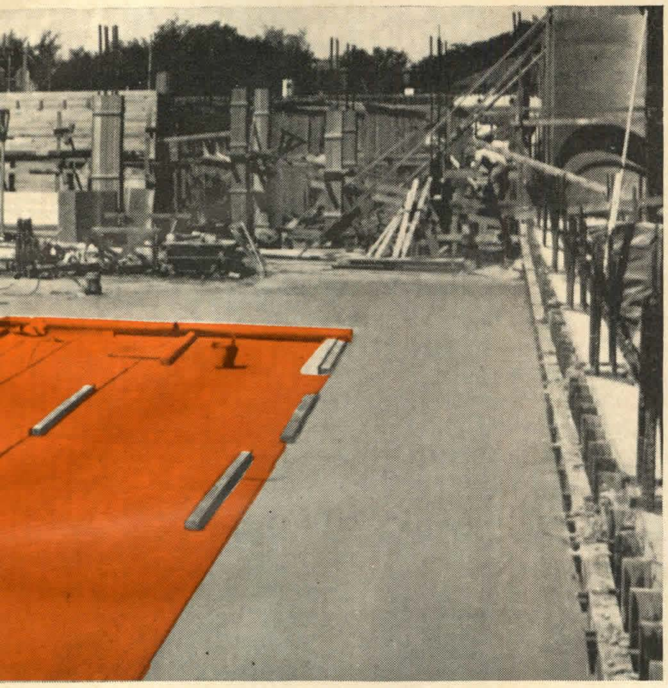
## Pyro-Kure®

Permanent, noncombustible vapor barriers for pipe jacketing, air conditioning duct insulation and industrial insulation facing: PYRO-KURE®. A line of flame-resistant, reinforced laminations with a U/L flame spread rating of "25 or less." Complies with National Building Code standard

## Roof Deck Vapor Barriers®

**For Class 1 Construction: PYRO-KURE 600.** More than twice the vapor resistance of vinyl. Approved by Factory Mutual.
**For Other Decks: VaporStop 710.** Single ply, pre-built barrier (0.28 perm) **at 20% less applied cost** and 80% less weight than 15 lb. felt.

# IT PRODUCES A BETTER CURE, PROTECTS SLAB AGAINST STAIN AND DAMAGE



Sisalkraft Reinforced Paper is 5-plies strong, so it protects the surface against abrasion and soiling from traffic and debris, and reduces clean-up costs. Sisalkraft is also waterproof, prolonging the hydration process to produce a denser, more uniformly cured slab.

This assures you, and your client, that the concrete will be clean and smooth with maximum strength and durability. Curing is "automatic" because a glance at the curing paper in place quickly tells you that the curing process is going on. And, for curing in cold weather, reinforced curing paper is especially important because it helps protect against frost damage.

**Make sure of Sisalkraft Curing** by using this specification: "As soon as the concrete has set sufficiently hard to permit application without marring the surface, a Sisalkraft curing paper, as manufactured by the Sisalkraft Division of St. Regis Paper Company, shall be unrolled over the slab. Laps of no less than 4" shall be sealed with mastic or pressure-sensitive tape. The curing paper shall be maintained in place for the duration of the curing period or until removal is directed by the architect."

**Send for Samples and Information:** Bulletin on "Curing and Protection for Better Concrete," plus samples of various grades will help you specify for maximum curing efficiency. Write today: Sisalkraft, 56 Starkey Avenue, Attleboro, Massachusetts.

**SISALKRAFT DIVISION** ST REGIS

On Readers' Service Card, Circle No. 427

foundation will be housed in the former Warburg mansion, which will contain quarters set aside for the use of the President, Vice-President, and their assistants, or any living former presidents . . . **John Vance** and **Robert Einsweiler** are replacing C. David Loeks, who held the position of Director of the Metropolitan Planning Commission in Minneapolis–St. Paul from its inception until his resignation in June this year . . . Planning to open an architectural office in Frankfurt after his release from West Berlin's Spandau Prison next month is **Albert Speer,** 61, former Nazi armaments chief. He is one of the last prisoners to be held under conviction of Nazi war crimes there . . . **Gene R. Schaefer,** Director of the Westinghouse Air Brake Company Mass Transit operations, has received an appointment from Robert Weaver to HUD's Transportation Advisory Committee. The committee has been newly formed to work in conjunction with Assistant Secretary **Charles M. Haar** of the new cabinet Department of Transportation . . . **Ted A. Niederman,** a young member of the Baltimore architectural firm of Rogers, Taliaferro, Kostritsky, Lamb will spend four months working and studying with the Tokyo firm of Kenzo Tange. Rogers, Taliaferro, Kostritsky, Lamb has commissioned Niederman to report on current trends in Japanese architecture.

At a Founder's Day convocation, **Paul Rudolph,** architect of the Charles A. Dana Creative Arts Center at Colgate, received an honorary Doctor of Fine Arts degree from the University. In part, the citation read: "When, in 1962, a Center for the Creative Arts became practically possible at Colgate, all concerned hoped it would not only provide desperately needed facilities for study and teaching in the arts, but become in its own right a fitting example of creative art as well. The choice of Paul Rudolph as architect insured the fulfillment of these hopes. The building he designed . . . adds artistic luster to our campus. Far from merely 'drawing' plans to accommodate teaching programs, Mr. Rudolph, by the bold and imaginative use of materials and spaces, combined form and function into an artistic whole —'full of surprises but always logical.' "

## HEADQUARTERS FOR GEORGIA PACIFIC SPROUTS IN PORTLAND

PORTLAND, ORE. When completed in September 1969, the Georgia Pacific building will be, at 27 stories, the tallest commercial structure in Oregon. Designed by the Portland office of Skidmore, Owings & Merrill, the tower will rise from a full-block landscaped plaza above a concourse of shops. Despite its height, the 365′ Georgia Pacific building will not seem out of place along Portland's skyline, for it will be in a line with the Hilton Hotel, (another SOM design), which is 309′ high, and the Public Service Building, 286′.

Georgia Pacific plans to occupy only 5 to 10 floors, leasing the remaining space to other firms. Construction of the 97′ x 158′ tower, which will cost more than $10 million, will get underway in 1967.

## AWARDS

**Lavette Cox Teague, Jr.,** a graduate research assistant at MIT, has received the $6000 Brunner Research Award for computer study. The award was made by the AIA, New York Chapter, and is the largest sum ever to be awarded in connection with the Brunner prize . . . Also awarded by the New York Chapter, AIA, was a $2000 grant-in-aid to architect **Simon Breines** of Scarsdale, N.Y., for the preparation for publication of a previous Brunner award study on "Pedestrian Islanding" . . . The city of Camden, N.J., has received an award from the American Institute of Planners in recognition of its "vast and dynamic design" for rebuilding and renewing major portions of the city. Credit went to **Willard Cooper,** Coordinator of Planning and Renewal. The only other area to receive an award in the competition, which usually makes awards in several population categories, was the Capital Region of Connecticut. This was the first award made to a metropolitan area. The region is composed of 29 towns, all but one of which have their own planning boards and city plans. Winner of the annual President's Plaque of the American Public Works Association was the Washington State Chapter this year. President Robert S. Hopson presented the plaque to **Robert G. Anderson,** Tacoma engineer and head of the Chapter. Important in the choice of the Washington Chapter as recipient of the award was its revision of its "Standard Specifications for Municipal Public Works Construction."

Among those lauded at the AIA convention and previously unlisted in this column are **Edward J. Logue,** development administrator of the Boston Redevelopment Authority, and **Albert Bush-Brown,** president of the Rhode Island School of Design. Both received honorary memberships for "distinguished service to the profession by a layman." AIA Honor Awards went to **Keyes, Lethbridge & Condon** of Washington, D. C., for Tiber Island, and to **Eero Saarinen & Associates** of Hamden, Conn., for Dulles International Airport and the CBS headquarters building in New York City . . . The Office of the Year Award, presented annually by *Administrative Management Magazine,* went to the **Rohm & Haas Company** building in Philadelphia. The George M. Ewing Co. was architect and engineer of the building . . . The $4000 J. Clawson Mills Fellowship in landscape architecture, awarded by The Architectural League of New York, went to **Robert G. Reimann,** an instructor in landscape architecture at Syracuse University . . . The James F. Lincoln Arc-Welding Foundation of Cleveland, Ohio, has announced the winners of its annual student design competition. First award winners were **Virgil Rasmussen** and **Donald C. Nelson** of South Dakota State University for their paper on the design of a building using long spans without intermediate supports, and **Charles C. Lozar** of MIT for his design of a sheet metal space frame . . . The National Institute of Arts and Letters recently presented **Romaldo Giurgola** this year's Arnold W. Brunner award. The award is given annually to an architect who shows promise of contributing to architecture as an art . . . Winners of the National Association of Architectural Metal Manufacturers' Student Design Competition are **James Robert Brock, J. C. Wang,** and **D. Sweet,** all from the University of Illinois . . . **John Storrs,** principal in the Portland (Oregon) architectural firm of John Storrs & Associates, was recently awarded the Wood Structure Design Award of the National Forest Products Association. Storrs received the award for his work on the Salishan resort and convention center on Oregon's Pacific Coast . . . The American Society for Church Architecture awarded its Fellowship Award to **Charles Edward Stade** of Stade, Dolan & Associates of Chicago . . . At the first annual presentation of the New York State Awards, **Corning Community College,** designed by **Warner, Burns, Toan & Lunde,** and **The Syracuse Savings Bank,** designed by **Harry A. King,** were among the eleven honored "for outstanding contributions to the physical and artistic enhancement of New York State" . . . Among those receiving honorary degrees at Illinois Institute of Technology's commencement in June was **Mies van der Rohe,** who headed IIT's department of architecture from 1938–1958 and was responsible for the original campus plan and many of the Institute's buildings . . . **William F. Brenan,** specifications writer of the Detroit architectural, engineering, and planning firm of Smith, Hinchman & Grylls, has received the first award in the annual competition of the Construction Specifications Institute for his work on the Crittenton Hospital in Detroit . . . **Leo Peter Dahl,** a fourth-year student at

*Main chapel entrance with stained art glass doors controlled by Norton Series 1940 overhead concealed double acting closers. These doors are very heavy and place an extremely high inertial load on the closers. In addition, a natural draft, due to the construction of the building, is always present. The doors are under control at all times.*

# Again, at the Dominican Education Center
# NORTON CLOSERS CONTROL DOORS—NOT DESIGN

## The quiet beauty of this Dominican Convent and Mother House is unobtrusively preserved with Norton® door closers.

DOMINICAN EDUCATION CENTER
DOMINICAN SISTERS OF SINSINAWA
SINSINAWA, WISCONSIN

Architect: Siberz-Purcell-Cuthbert, Architects
Madison, Wisconsin

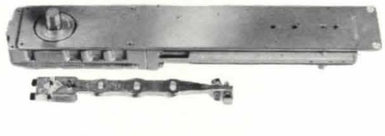
Hardware Distributor: Wolff, Kubly, Hirsig Co.
Madison, Wisconsin

*This beautiful convent was set into the hillside and blends naturally with its surroundings. Much of the stone used in the construction of the chapel was moved from the hillside to make room for this lovely building.*

Construction of a new education center was to be complete with dining areas, living quarters, schoolrooms and a new chapel. The architecture had to tie in with existing buildings and blend into the hillside. The new Dominican Education Center at Sinsinawa, Wisconsin, meets all these requirements in a quiet, beautiful setting unique only to a religious community.

To follow through with this quiet beauty, Norton Door Closers were used throughout. There was no problem in providing adequate door control and in complementing the architectural decor. Norton closers are designed and built to give the very best in positive door control. In addition, they have been styled to give the architect complete freedom in realizing the decor and interior decorating feel he desires. Norton closers truly control doors, not design.

*To meet the control need of this custom built door, Norton Series 1940 overhead concealed closers were used. These closers mount in only 1¾" x 4" of the head jamb. They are non-handed and double acting with adjustable back check.*



EATON YALE & TOWNE INC.

**NORTON®** DOOR CLOSER DIVISION

372 Meyer Road, Bensenville, Illinois, 60106

# FOR QUIET BEAUTY IN DOOR CONTROL

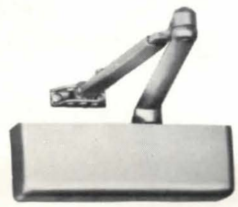
## NORTON DOOR CLOSERS

EXIT DOORS

The entire atmosphere of the Dominican Education Center at Sinsinawa, Wisconsin, demands a quiet beauty that is conducive to a contemplative life. The very architectural decor is symbolic of the traditions and cultural background of this institution.

Norton Series 7000 closers with aluminum covers were selected to add subtle beauty to the interior. In selecting these narrow projection closers with covers, it was possible to have perfect door control for all the various locations throughout this building and still accomplish the desired effect.

MAIN DINING ROOM DOORS



*Series 7000 narrow projection closers are available with cover to match or contrast any architectural or interior design. Aluminum covers are available in clear aluminum, bright brass, and dull bronze to match door hardware. Also available with wood bonded to the surface of the cover in over 67 native and exotic woods to match room or door paneling. Covers with a prime coat of paint are also available for repainting on the job to match or contrast the interior decor.*

ENTRANCE DOORS

LIBRARY DOORS

EATON YALE & TOWNE INC

**NORTON**® DOOR CLOSER DIVISION

372 Meyer Road, Bensenville, Illinois, 60106

Gentlemen:

Please send me the following literature on Norton Door Closers:

☐ Series 1940 ☐ Series 7000 ☐ Complete Norton Line

Name ____________________

Title ____________________

Association ____________________

Address ____________________

City, State & Zip ____________________

**Exit doors** *to the courtyard from the enclosed corridors are controlled by Norton Series 7000 narrow projection closers with covers of anodized aluminum. The closers have been selected to match the aluminum door and triangular window frames.*

**Main dining room doors** *also feature Norton Series 7000 narrow projection closers. Here the aluminum cover matches perfectly with other hardware to give a striking contrast with the dark finish of the door.*

**Entrance doors** *to the chapel area are controlled by Series 7000 closers with covers. Again, these closers blend in naturally with the modern design of the doors.*

**Library doors** *immediately under the chapel have Norton Series 7000 closers with aluminum covers to match door hardware.*

Auburn (Ala.) University's School of Architecture, has won a $1500 travel grant from the Alabama Gas Corporation . . . **Michael R. Foil,** also at Auburn, won the Alabama Concrete Industries Association design competition . . . **Robert E. Simon, Jr.,** developer of the new town of Reston, Va., has received the first medal of Urban Pioneer from the Department of Housing and Urban Development . . . **Walter A. Netsch** of Skidmore, Owings & Merrill was recently presented with the Total Design Award of the National Society of Interior Designers.

## *EIGHT HOUSES TO A FLAT*

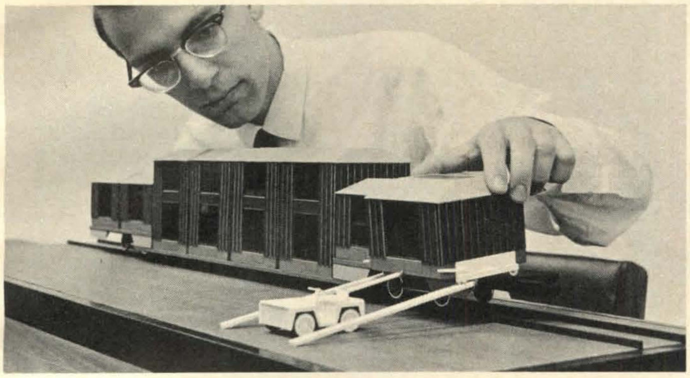


Photo: Authenticated News International

STANFORD, CALIF. Last June, Robert L. Wendt received a master's degree in art from Stanford University. His undergraduate degree is in architecture, and his aspirations seem to lie in an interdisciplinary area that is often given lip service but seldom concrete thought.

As part of one of his graduate courses, Wendt designed a vacation home that can be wheeled onto a railroad flatcar, shipped to its destination, then trundled off and rolled to a vacation site. Nor do these homes have to be just for vacationers. With modifications, Wendt feels, they could be used by migrant farm workers, by lumberjacks, by miners, by construction personnel, or by the military. His design shows eight cabins carried by each flatcar. Half of these are one-story cabins that can hold three persons. Half are two-story units with accommodations for seven. Each cabin would, of course, be self-sustaining. Refrigerator, stove, water heater, air conditioning, toilet facilities, and lamps would all operate on bottled gas. There would be enough water and fuel to last about a week.

Wendt envisions his cabins, which have sliding glass doors on both sides, as suited to glass-fiber and steel construction. Initial talks with railroad officials made Wendt optimistic about the future of his project.

versity of Illinois Board of Trustees is Ralph C. Hahn, owner of the firm of Ralph Hahn & Associates, Consulting Engineers, Springfield, Ill. He is the only member of the engineering or architectural professions running for a statewide office in Illinois . . . A 10-week course entitled "Economic Aspects of Building and Construction" has been instituted at New York University's School of Continuing Education through its Management Institute. Lecturers will be leading real estate men, who will base their lectures on actual cases. David Tishman, William Zeckendorf, Jr., Max Wechsler, and Sol Horowitz are among speakers scheduled to discuss such topics as "Building Costs," "Conflict Between the Builder and Architect," and "Appraising the New Building." More information may be obtained from The Management Institute, New York University, 10 E. 8th St., New York, N.Y. 10003.

## METROPOLITAN STADIUM FOR DETROIT

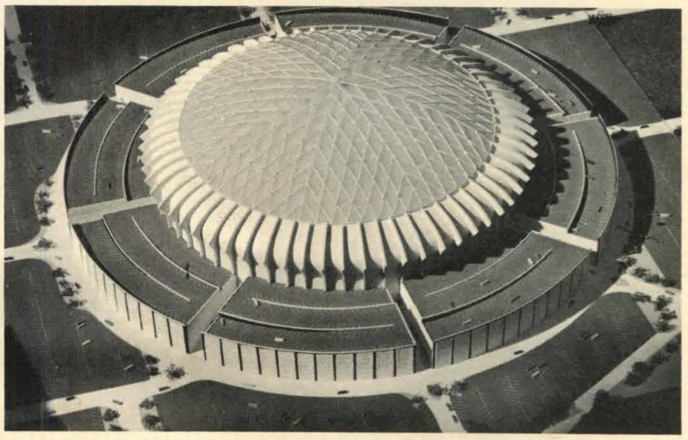


Photo: Lens-Art Photo

DETROIT, MICH. If the citizens of Detroit agree to back an astounding $60 million bond issue, the city will have a new metropolitan stadium, located on the Michigan State Fairgrounds. As designed by the firm of Louis G. Redstone, the stadium, which is now in working-drawings stage, will provide 63,000 seats for baseball and 67,000 for football. It will also have facilities for track and field. (For years, Detroit has been trying unsuccessfully to attract the Olympic Games.) Movable seats on runners will slide out over the track when it is not in use. Also included in the design is a translucent roof system, supported by an exterior steel grid, in an attempt to avoid the difficulties with vision that the individual skylights in the Houston stadium gave spectators there. The span of the dome will be about 620′, and its height above the playing field 270′.

## SCHOOLS

Retiring from the Harvard Graduate School of Design are Walter F. Bogner, Norman T. Newton, and Charles William Eliot, 2nd. Professor Bogner was a member of the team of Harvard professors who won the "Boston Prize" in 1944 for a master plan for the development of greater Boston. He was also instrumental in the planning of the Back Bay Center project, a proposal for a business center over the Boston and Albany railroad yards, and conducts a private practice as an architectural consultant. Professor Newton, who becomes Professor of Landscape Architecture, Emeritus, long practiced landscape architecture before joining the Harvard faculty in 1939, and has written books on design and other subjects. Known for his involvement with Federal planning and resource agencies, Professor Eliot is also a planning consultant for towns, cities, and larger areas. He has been Professor of City and Regional Planning since 1959 . . . A candidate for the Uni-

## *COMPETITIONS*

The American Iron and Steel Institute has announced its Design in Steel Awards Program, sponsored by the steel industry. Eligible are all practicing individuals or teams of professionals in the fields of architecture, design, and engineering in the Americas. The jury will be composed of nine professionals — three designers, three architects, and three engineers, and will consider entries in the categories of consumer products, industrial products, commercial equipment, automotive products, residential construction, low- and high-rise commercial, industrial, or institutional construction, and public works construction. The program is coordinated by the National Design Center, 415 E. 53rd St., New York, N.Y. Deadline for entries is midnight, January 27, and judging will take place February 2 and 3 at the National Design Center. Details, including the definition of categories and criteria, will be published soon in a brochure to be distributed by the AISI.

another
**NEW LOOK**
**IN LIGHT**
product

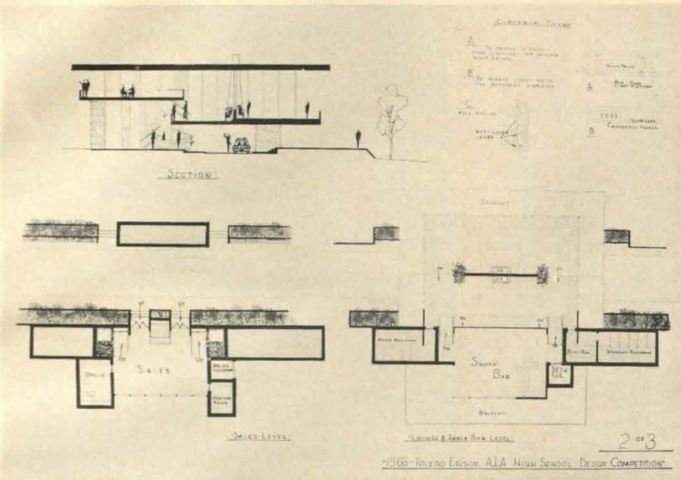
# 768 REASONS TO SPECIFY THE NEW VENTED PHOTOMETRIC

The first *vented* wrap around plastic refractor gives you 768 sound reasons to specify Wakefield's new Vented Photometric luminaire. 768 small, square louvers the length of the lens allow air to circulate freely throughout the unit, decreasing operating temperature, lengthening ballast and lamp life, and *increasing efficiency almost 10 percent.* Available in either styrene or acrylic, this slim, handsome, injection molded refractor offers the same brightness level and strength as the popular solid Photometric refractor, while actually *increasing light output.* Available in standard 2-lamp 4-ft. and 2-lamp 8-ft. tandem fixtures, this super-efficient vented refractor is interchangeable with solid refractors on present Wakefield Photometric luminaires. It features the same easy lift-slide-remove features with no latches or catches. Ask your Wakefield Representative or write for information on the new Vented Photometric . . . the only unit better than the Photometric. Wakefield Lighting Division, P.O. Box 195, Vermilion, Ohio. ITT Wakefield Corporation, a subsidiary of International Telephone and Telegraph Corporation.

**Wakefield Lighting** **ITT**

On Readers' Service Card, Circle No. 447

## *TEEN-AGE ARCHITECTS*

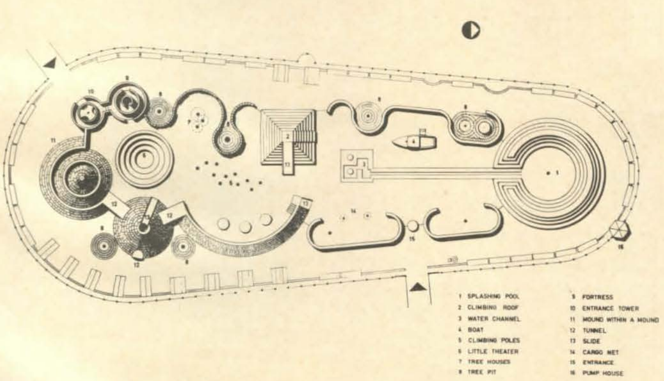



TOLEDO, OHIO. One of the most worthwhile things the AIA does for the profession is to stimulate young students to study architecture. Often, this activity is undertaken by the local AIA chapters, but the problem is a big one and the funds and resources of the local chapters are limited. For 16 years, the Toledo chapter has sponsored a design competition for high school students. It was a modest program until, in recent years, the local Edison Company became a joint sponsor. Now, with more substantial resources behind it, the competition can attract more talent and more attention.

The Edison Company puts up a $500 scholarship for the senior winner, a $75 merchandise award for the best electrical design, and foots the bill for the awards banquet. The Toledo chapter puts up the $150 second prize, and offers the services of 15 or 20 architects who visit local schools to set up the competition. Each February, students are given an architectural design problem — one limited in scope and one not readily solved by a trip to the library.

This year's winner was James Wright, a recent graduate of Macomber Vocational High School, whose plans for a ski lodge are shown.

## ADVENTURE IN THE PARK



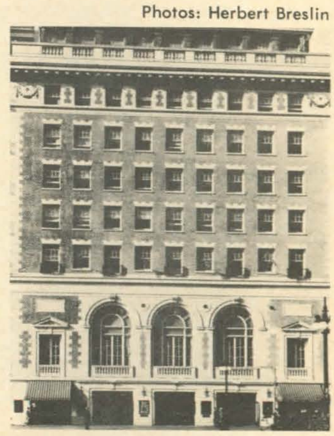

NEW YORK, N. Y. By December of this year, Central Park will have another playground. The concrete and asphalt of the 67th St. playground will be replaced with sand, and the single open space there will be carved up into a series of smaller related play areas. It looks like fun. Sponsored jointly by the Estée and Joseph Lauder Foundation (which put up the $70,000 for construction and play equipment), the Mothers' Committee to Improve the West 67th St. Playground (which will provide a full-time supervisor for six to eight months a year), and the New York City Parks Department (which will provide and maintain both the playground facilities and a continuing supply of mobile equipment), the play area will be this city's first "adventure" playground. The "adventure" idea (let the kids build things and tear them down) is nothing new (grown-ups do it all the time). But as an organized approach to playground philosophy, it is an inviting respite from the dull nothings usually offered city children.

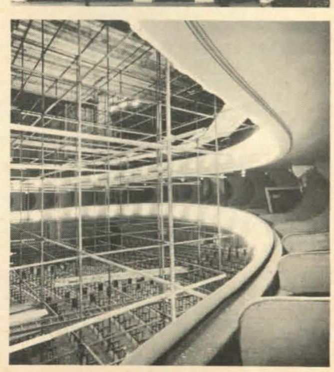
Adventure playgrounds first originated in the British and Scandinavian countries, where the bombed-out wastes of war provided field days for curious, imaginative children. Now, Richard Dattner of Davis, Brody & Associates in New York has designed an adventure model for the New York child who has neither the wastes of Europe nor the alleys of Harlem to intrigue him. The playground will have a splashing pool with a water channel for sailing boats, a series of climbing poles and mounds, a bumpy slide, a cargo net, a real boat to sail the Seven Seas and not go out of the park on, a little theater for puppets and child actors, tree houses and pits, and a jumble of wooden poles and boards to practice architecture with.

At a rate of one a year for the next 10 years, the Lauder Foundation plans to donate other experimental adventure playgrounds to the city. And if this first one is any indication, they can't build them fast enough.

## HOW TO KEEP YOUR LANDMARKS AND HAVE THEM TOO

Photos: Herbert Breslin





CHICAGO, ILL. On September 29, the Chicago Symphony Orchestra began its sixty-second season in Chicago's Orchestra Hall. Designed by Daniel Burnham, it was the first permanent home for a symphony orchestra in the U.S. The auditorium, with seats for 2581 in its nine-story building overlooking Michigan Boulevard, cost $750,000 in 1904. Last summer, it underwent a $2 million face-lifting, underwritten by a contribution from Silvain Wyler. Probably the single most elaborate item was the installation of a central air-conditioning system. As a result, certain areas of the ceiling, unchanged except for color, are perforated for air outlets and for placement of sound diffusors to improve the acoustics for the orchestra.

The auditorium was also completely redecorated, the seats reupholstered, and a new carpet laid. The main lobby has been enlarged, as has the gallery lobby on the sixth floor. (The gallery can now be reached by the main staircase.) Backstage, a conductor's suite was installed, dressing rooms were provided for soloists, and lounge and locker space provided for orchestra members. Under the stage are a soundproof warm-up area, and beneath the lobby a recording room, a music library, and a chorus rehearsal room.

Architect for the renovation was Harry M. Weese & Associates, who were also architects for the renovation of Louis Sullivan's Chicago Auditorium Theater.

## THE STUDENT CENTER WITH AN ANGLE

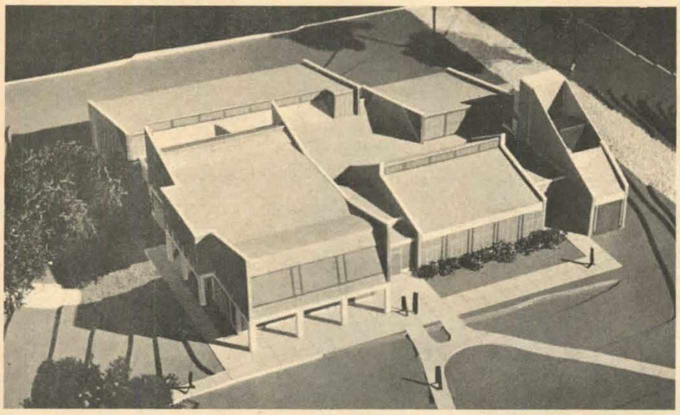


Photo: Orlando R. Cabanban

JACKSONVILLE, ILL. This fall, construction will begin on Illinois College's Student Center, a multipurpose complex that uses every trick in the book. Vaulted laminated wood beams and deck, clerestory, floor-to-ceiling and vertical slot windows, varying roof heights, sloped parapets, and arcades will provide 14,640 sq ft of space for a two-story bookstore, a faculty lounge, and student activities offices (remember when it was student lounge and faculty offices?), snack bar and lounge and game room. Mittelbusher & Tourtelot of Chicago are the architects.

## RAISING RESEARCH

BALTIMORE, MD. Ninety-nine years ago Johns (he thought in plurals) Hopkins gave the city of Baltimore a token of his appreciation and the beginnings of one of the finest medical centers in this country. Four years ago, Johns Hopkins University started a $86 million fund-raising campaign, $41 million of which is set aside for construction. In September, 1965, work was begun on the $3,500,000 research building (right in photo).

Designed by Baltimore architects Fisher, Ness, Campbell & Partners, the nine-story 110,000 sq ft Research Building will, by January of next year, house the departments of medicine, psychiatry, biomedical engineering, otolaryngology, obstetrics, and gynecology within its poured concrete, sand-blasted walls. Capped by a penthouse housing mechanical facilities, all utilities will run in the exposed vertical and horizontal bands around the building, much like the human circulatory system. This mechanical solution allows for the maximum interior flexibility. With outlets spaced every 10′ throughout the research floors, it is possible to turn offices into labs and labs into offices by plugging into the system. To the left of the Research Building will be a 65,000 sq ft, $2 million, 750-seat auditorium with below-grade meeting and seminar rooms. Architects hope to have this building out for bids in August. Both structures will sit on a raised landscaped plaza and will have a tunnel accessway to the university.

## WOULD YOU LIVE IN A ZOO?

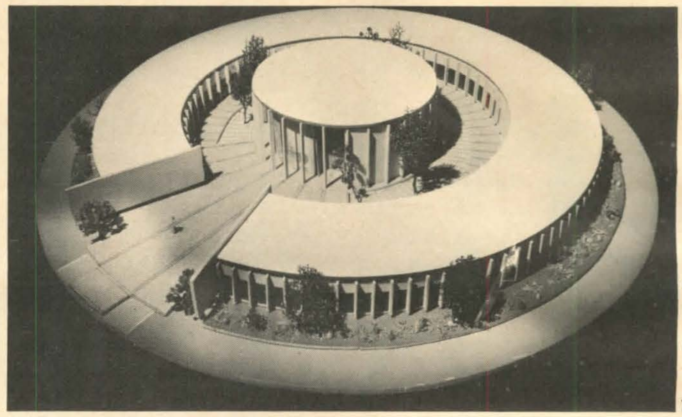


Photo: George Lyons

SAN DIEGO, CALIF. "The Camel's hump is an ugly lump,/Which well you may see at the Zoo;/But uglier yet is the Hump we get/From having too little to do." The Elmer C. Otto Center of the San Diego Zoo, will, by the time it is completed in October, deny Kipling's versification and give young and old a solid round of zooing. The 20,000-sq-ft, $750,000, one-building zoo will house a 200-seat auditorium and space for administration and education facilities, as well as an orangutan or two. Designed by San Diego architects Tucker, Sadler & Bennett, the zoo has only one missing link — and a sad one at that. This zoo has been designed for people, not for the animals.

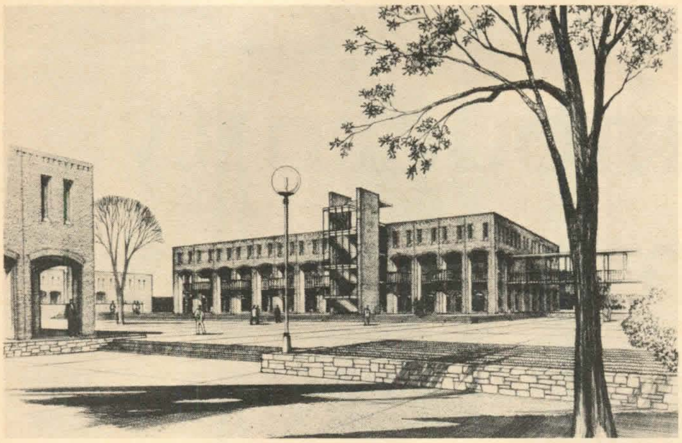
## *BOSTON SOB*

BOSTON, MASS. The first building in the $175-million, 52-acre Government Center here was completed and occupied last June. The Emery-Roth designed, 22-story, $18-million State Office Building (shown) will house nine government agencies and 3000 employees. The precast concrete building, with its thermos-bottle cap on tight, will have a neighbor in the soon-to-be-dedicated, 26-story Federal Office building, designed by The Architects Collaborative and Samuel Glaser Associates. Also coming along is Kahlmann, McKinnell & Knowles City Hall (half finished), a Welton Becket Associates crescent-shaped of-

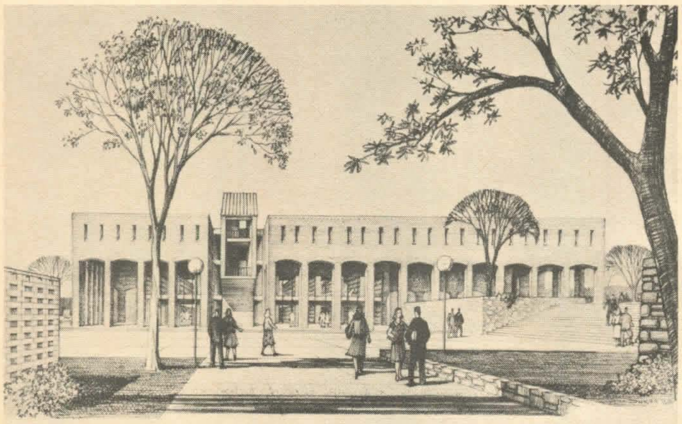
Photo: Cunningham-Werdnigg

fice tower (in second construction phase), and an Emery Roth & Sons and Edward Larrabee Barnes office building (foundation under way). Weighted down by these projects, Scollay Square shall not rise again.

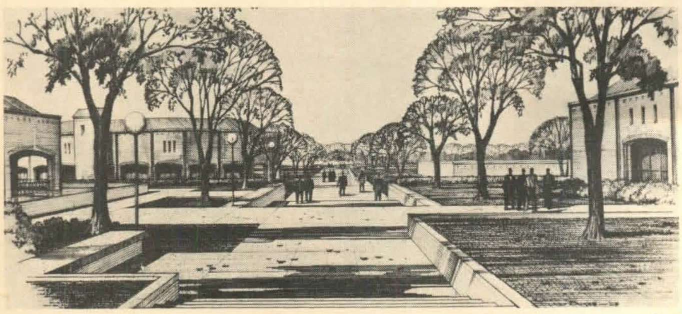
## TEXAS COLONIAL



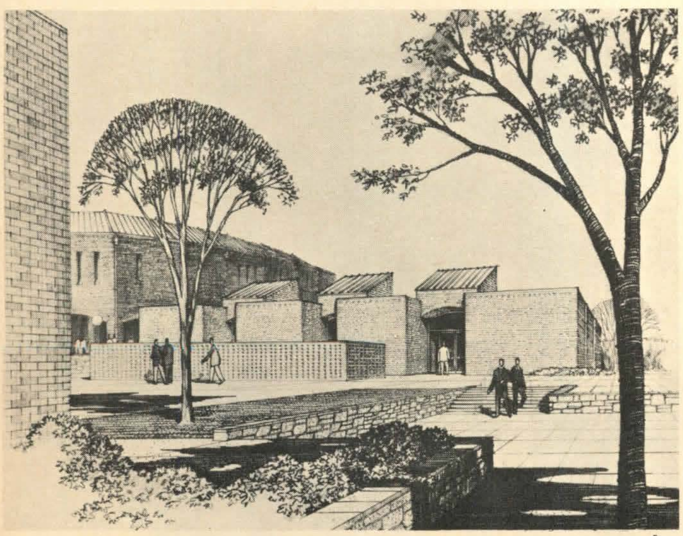
1



2



3



4

SAN ANTONIO, TEX. By spending millions, educational institutions in North America's oldest city are following the example of those in many of her younger sister-cities. St. Mary's University (founded 1852) is spending $25 million for a 10-year program of building and curriculum improvement. Construction of 10 new buildings, $11 million worth, will be begun this year to make ready for St. Mary's expected doubled enrollment (to 6600) by 1975.

Shown here is the science addition **(1)**, library **(2)**, view toward the law center **(3)**, and law faculty offices **(4)**. All buildings will be of sand-finished local brick and will be what San Antonio architect Brooks Martin calls "Texas Colonial." The Texan forms are evident in the buildings at first sight: post-and-lintel Texas mission arches, adobe construction with small, narrow windows to conserve heat, or exclude it, and colonnades for weather protection. But the "Colonial" part of Martin's label is strictly his own. Feeling that "basically all architecture is Colonial," that everyone borrows from the past, Martin, to judge from the renderings, has successfully combined his borrowings of regional motifs with a contemporary feeling.

## BACK TO THE ROMANS

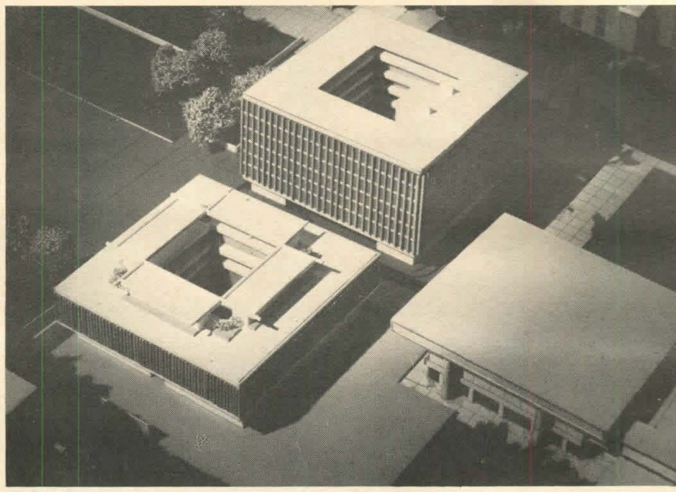


Photo: George Lyons

SAN DIEGO, CALIF. Architecturally, the trend is Roman. Commercial, residential, and institutional plans are increasingly focusing on the inner courtyard. Now a two-dormitory unit, the Revelle College Residence Hall Unit II at the University of California at San Diego, will soon be "atriumized." The dormitories, to be completed in the fall of 1967 at a cost of $2,200,000, will complete the final phase of the university's first college. San Diego architects Tucker, Sadler & Bennett have designed a four-story and a six-story building connected by a mall that will have landscaped central courts and balconied atriums for 640 students. The finned vertical elements of the buildings will provide sun protection and privacy.

## CALENDAR

At the 19th annual **Fall Convention of the American Concrete Institute,** to be held October 24–28 at the Jung Hotel in Detroit, Mich., committees will report on two new standards, "Recommended Practice for Concrete Floor and Slab Construction" and "Recommended Practice for Manufactured Reinforced Concrete Floor and Roof Units" . . . **"Toward a More Livable City"** is the theme of the Pennsylvania Chapter of the ASLA's regional symposium, scheduled for October 27–28 at the Hotel Hershey, Hershey, Pa. Information may be obtained from Charles A. DeDeuwaerder, Program Chairman, 1101 Greenfield Avenue, Pittsburgh, Pa. 15217 . . . On November 9 and 10 at New York's Statler-Hilton Hotel, **The Committee for Construction Industry Product Literature** plans to evaluate building products literature aimed at architects, consulting engineers, builders, and building material dealers. Registration for the conference is being handled by the

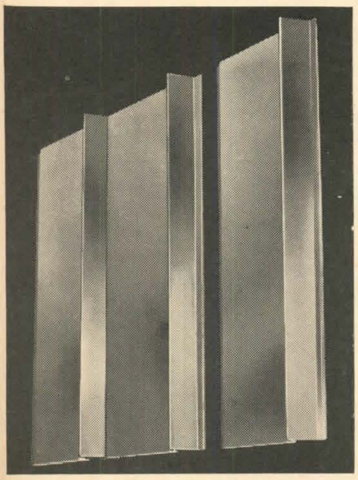
# NAARCO NEWS

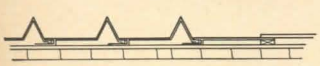
T.M.

## 1

### Naarco Fascia now in three new colors, many custom shapes

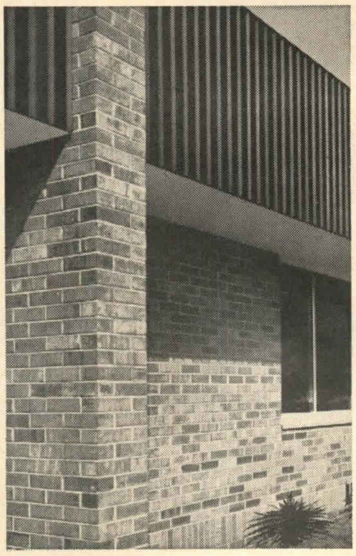
NAARCO Fascia, a multi-purpose aluminum facing-siding material, is now available in three durable NAARCOLOR hard coat finishes, black, dark bronze, and deep bronze.





Extruded in 5″ width and lengths up to 28 feet, NAARCO Fascia is stocked in several popular standard shapes. Plus, to help architects achieve unique effects, NAARCO also supplies custom shapes that fall within the above dimensions.

Other outstanding advantages of NAARCO Fascia include easy interlocking, snap-on assembly without screws or nails, no plywood backing required. For additional information including a custom design blueprint, circle Number 1 on our coupon and mail with your letterhead.



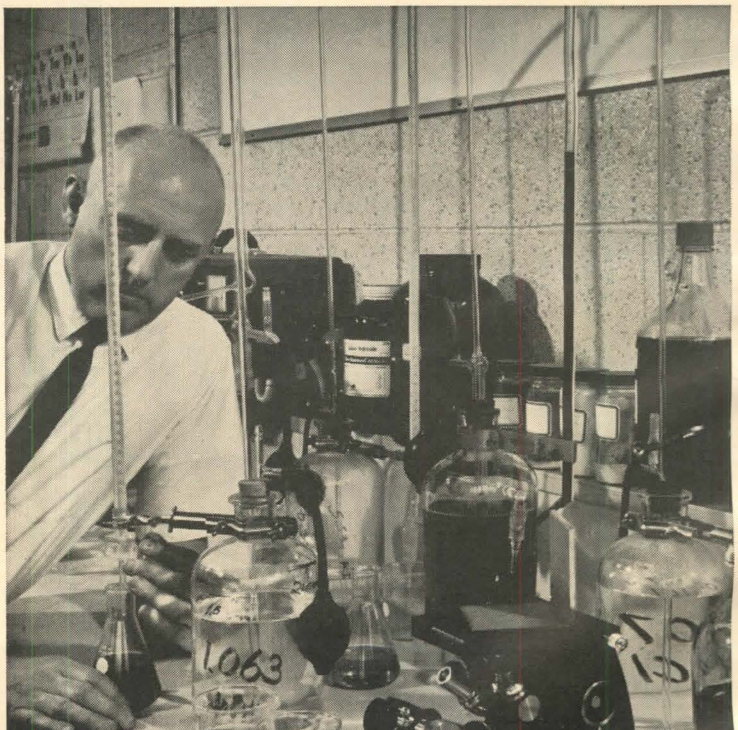
## 2

### Naarco's chemistry lab... the search for quality

A complete chemistry laboratory for research and testing is one way NAARCO puts teeth into the old cliche "single source responsibility."

Purpose of the lab? NAARCO curtainwall, mullions, windows, and other aluminum products are dependent on many allied products such as caulking compounds, laminated panels, finishes, etc. As a "single source of responsibility" NAARCO wants to be sure all supporting products are of the highest possible quality so the installation is totally satisfactory. And so they test. And test. Result? Only caulking compounds with long life expectancy and good adhesive characteristics are selected thus insuring weather-tight installation. Only laminated panels whose adhesives can endure time or exposure to fluctuating conditions will be used with NAARCO curtainwall sections.

In addition to testing caulking compounds and panels, NAARCO's lab also has continuing analysis on weather strippings, finishes and many other materials that affect the outcome of a job thus fulfilling "single source responsibility."



3

## Naarco overnight delivery keeps building on schedule

A shining NAARCO "semi" is a welcome early morning sight to architects and contractors on major construction jobs across mid-America and along the East Coast.

NAARCO's company-operated fleet, of course, means no-delay shipment of materials to the job site. But it has many other advantages too.

NAARCO President, Bob Barnard, says, "We're not in the trucking business by accident. Not only do we save valuable time with overnight delivery but we have greatly reduced partial shipments, lost goods, damaged goods and many other problems that cost everyone time and money."

As another aspect of their "single source responsibility" policy, NAARCO's own fleet cuts red tape and helps architects and contractors meet their completion dates.

4

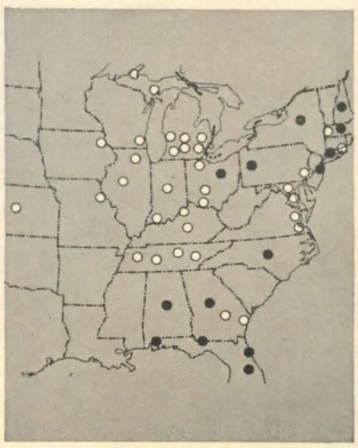
## Naarco adds 14 agents for fast, total service

"Faster info to architects when they want it." Better availability of NAARCO products. Total on-the-job assistance when it's required.

These are the reasons NAARCO recently added 14 new agent-organizations to their marketing team, according to Ross T. Griffith, NAARCO Marketing Vice President. The addition gives NAARCO 45 agents across the U.S.

"Timing is the most critical factor in the agent-architect relationship," Griffith added. "If we're there when the architect wants us, fine. If we're unavailable, forget it. We've put men where it will help architects and contractors get what they want."

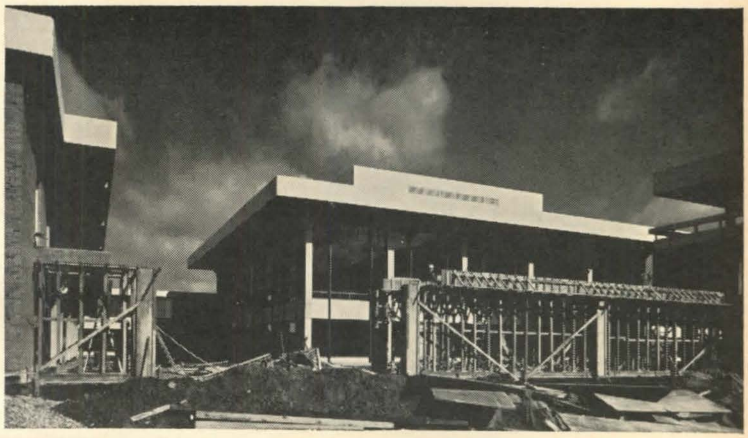
Black dots on the map indicate new agencies. Circles pinpoint where NAARCO agents already serve.



5

## Naarco windows grace new office complex

Standard size NAARCO windows have been creatively, and beautifully used in this new, five-office complex designed for the Scott-Forsman & Co. of Chicago. Architect: Perkins & Will, Chicago.



NAARCO

NORTH AMERICAN ALUMINUM CORPORATION
Kalamazoo, Michigan 49004 · Phone (616) 349-6626

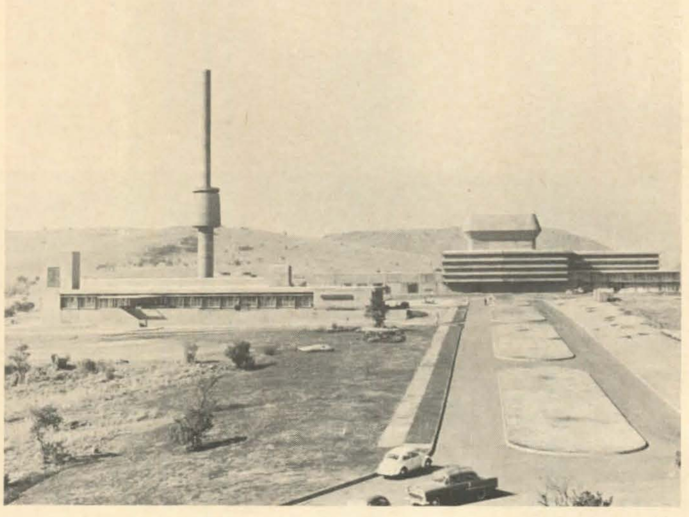
Gentlemen:
Please send me more information on the following articles:
(please check)
1. □ 2. □ 3. □ 4. □ 5. □

Name________ Title________
Firm________
Street________
City________ State________ Zip________

On Readers' Service Card, Circle No. 403

Producers Council at 1717 Massachusetts Avenue, N.W., Washington, D.C. 20036. **The Connecticut Building Congress, Inc.,** will hold its Fifth Annual Symposium and Exposition on October 25 and 26. Members of the Congress will meet at the Park Plaza Hotel, Chapel Square, New Haven, Conn., to participate in a symposium entitled, appropriately enough, "Threshold to the 70's."

## *NUCLEAR POWER CENTER FOR SOUTH AFRICA*



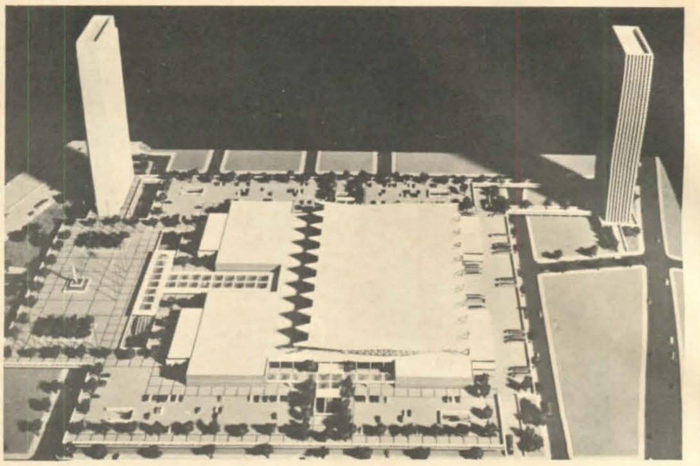
PELINDABA, SOUTH AFRICA. Comedian Tom Lehrer sings a song he composed called "Who's Next?" It starts out, "America has the bomb but that is good because we're for peace and motherhood. Russia has the bomb and that's okay, for the balance of power is maintained that way." Several other countries also have the bomb, of course, and all the rest wish they did. With the official opening of the National Nuclear Research Center here last summer, South Africa has the means to develop one if she wants to. Ostensible purpose of the center is to help the country convert to nuclear generation of electric power, and, by 1970 at least, some areas are expected to do so. Designed by Pretoria architect Bryan Sandrock, the complex, known as Safari One (for South African Fundamental Atomic Reactor

Installation), is in keeping with both its purpose and with the barren transvaal veldt on which it sits. Imbedded in the concrete facade of the reactor building is a mural symbolizing the "nuclear imprint of our age."

South Africa has one of the world's most readily available supplies of fissionable material, found in the piles of earth cast off by its gold mines. If the 1970 nuclear power goal is fulfilled, South Africa will be well ahead of both the U. S. and Russia in clean power production — even without the bomb.

## *BIG, BUT*

LOS ANGELES, CALIF. The Los Angeles Auditorium-Exhibition Center is big: There will be 31 acres outside and 458,000 sq ft inside. Mark Twain, who thought an interior space was grand if it had enough room "to swing a dead cat," would have been impressed. The main exhibit area will have a minimum height of 40′ throughout its 300′ span—believed to be the largest "high bay" area in the U.S. With the aid of a 40′ folding, soundproof partition, this space can be divided to serve three separate, simul-



taneous functions. Designed by Charles Luckman & Assoc., the structure is a cable-suspension building that uses the engineering principle of prestressed high-tension cables to take the place of rigid steel trusses. "It also provides the 'architecture' of the building," says Luckman, "by giving the roof a dramatic shape, with constantly changing shadow patterns during the course of the day." Terraced landscaped parking will be provided, Los Angeles style—for 3000 cars. When completed, the Center stands to gain $16 million yearly from conventioneers. The Los Angeles City Council approved the project last month.

## EAVESDROPPINGS

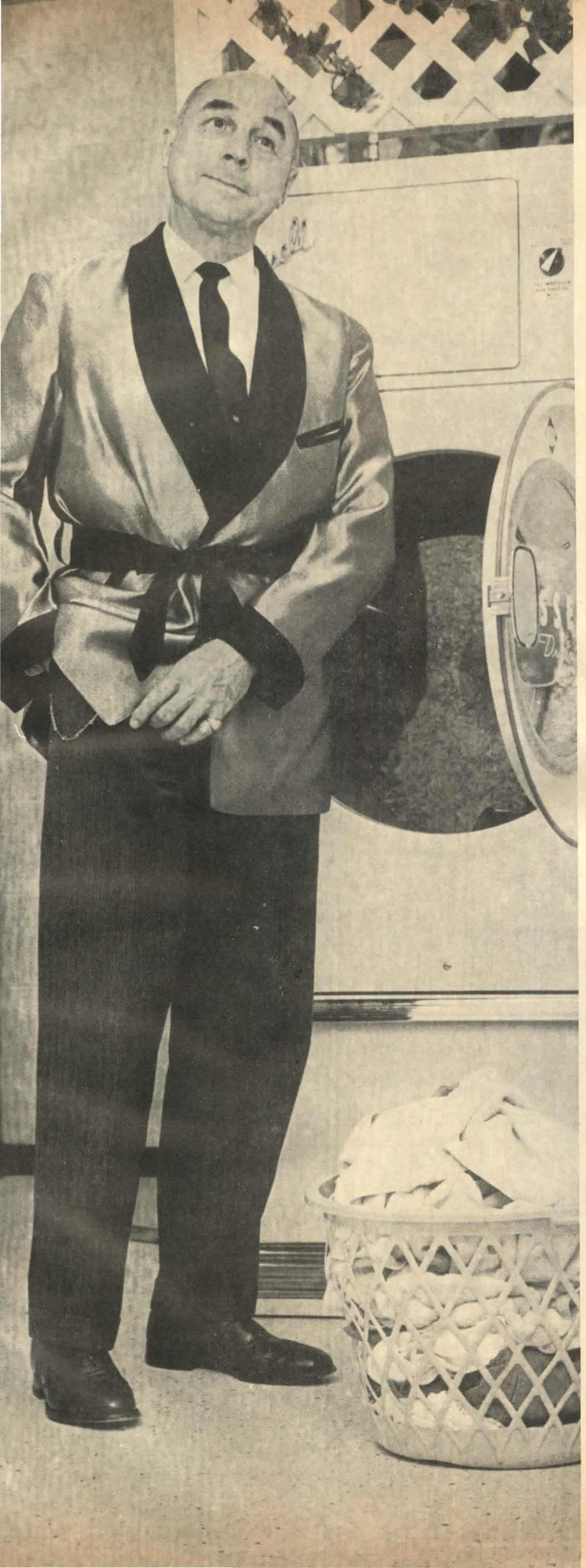
"In 1906, when the $25 million hole was dug in the old Tenderloin district for the $112 million terminal and landmark (Pennsylvania Station), the city's and the railroad's sights were high. Now dreams of glory and broken Doric columns lie shattered in the Secaucus meadows." *Ada Louise Huxtable, writing in* The New York Times.

"Most, if not all, architects still consider architecture as an esoteric art, and as such take the position that as artists nobody is going to tell them what to do. I have often thought that the synonym to the word profession is arrogance, and particularly so with the architectural profession." *Architect Kyo Isumi in a letter to* P/A.

"After careful observation and investigation into the lack of progress in meeting the problem of building and development, it became clear that progress was essentially blocked by the interaction of proliferating, restrictive, inflexible planning and zoning regulations; archaic, nonuniform codes and inspection practices; union work rules and limitations; the highly fragmented character of the construction industry (thousands of small firms, with limited financial capacity and unequal bargaining power); the unwillingness of mortgage lenders to support builders who might want to innovate and experiment." *George T. Bogard of the General Electric Company in a speech titled, "Role of Large-Scale Enterprise in the Creation of Better Environment," given at the American Institute of Planners conference.*

"Since Stonehenge, man has always wanted to organize his environment, to create the ideal in every way, including the city, the ultimate and most enduring expression of any age. He still aspires, but there is growing confusion. . . . Certainly the urban designer-architect is impotent unless he recognizes the forces in society and translates these forces, or desires, into three-dimensional reality. What are the 20th-Century forces which must be tamed, understood, deflected? They are, number one, materialism; number two, shear increase in size necessitated by the population explosion; and number three, the scientific impact on our society." *Paul Rudolph, speaking at Colgate University.*

"In an opera house, everything has to be designed in terms of sound. Because sound



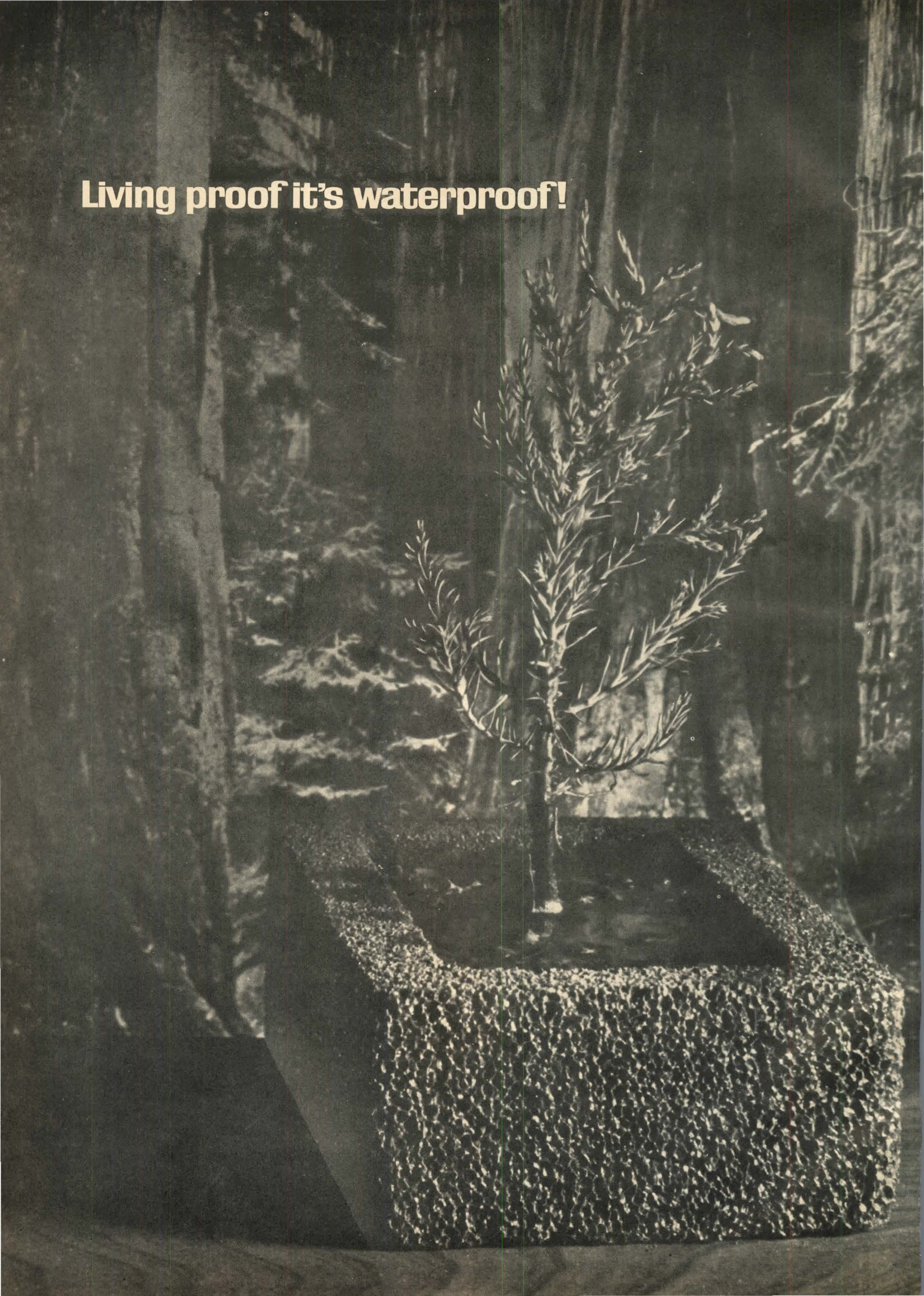
# Cissell dryers are economy minded, too!

They know how to save money — especially for high rise apartment owners. The Cissell Petite is low in first cost and it's engineered to operate as economically as possible on either gas or electricity (whichever earns the lowest rate for you). In addition the Cissell Petite is as maintenance and repair free as it's possible for a dryer to be. It's also very easy and economical to install the 48″ high, 28¾″ wide, 30″ deep Petite. It fits in compact space, does not require special high ceilings or reinforced floors and it's light enough to be easy to handle. Simple to vent, too. And in addition to all that, the Cissell Petite has features such as 16 pound dry weight, that apartment tenants want. The 28¾″ wide, 45⅛″ deep, 68½″ high Compact, with 25-pound dry weight capacity, is also efficient and economical where you need a larger dryer. W. M. Cissell Manufacturing Co., Inc., Louisville, Kentucky.


*Petite* *Compact*

**CISSELL®**

On Readers' Service Card, Circle No. 341


Living proof it's waterproof!

# FOAMGLAS®
# Roof Insulation will still be waterproof when this sequoia is 200 feet tall.

Talk about long lasting! The Sequoia in this FOAMGLAS planter belongs to the oldest living species around. Some of the giants in California are over 2,000 years old.

We're not claiming FOAMGLAS, the cellular glass roof insulation, will last that long (although the material's inorganic composition makes it possible). But we do know that the FOAMGLAS this planter is made of will still be waterproof—still have all its original insulating efficiency—years after the Sequoia has outgrown it.

FOAMGLAS is the only completely waterproof and vaporproof insulation. We won't give you a 2,000-year guarantee. But FOAMGLAS is guaranteed for 20 years. Once it's down on your client's roof, he's protected.

Get full details on new bevel-edged FOAMGLAS®-BOARD —ideal way to get the full value of FOAMGLAS in a 2′ x 4′ x 1½″ thick unit. Write Pittsburgh Corning Corporation, Department PP-106, One Gateway Center, Pittsburgh, Pa. 15222.

PITTSBURGH
CORNING ®

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

BULLETIN: FOAMGLAS IS NOW AVAILABLE FOR IMMEDIATE DELIVERY. JUST GIVE US A CALL.

On Readers' Service Card, Circle No. 414

is the main reason to go to the opera. But after the Philharmonic experience, the whole science of acoustics was washed away. Until then, everyone thought that sound travels as light does, that it bounces off a wall at the same angle as it goes into the wall. High frequencies do that. But now we know, for example, that the lower frequencies don't. They act more like mass, like a billiard ball with English; they sort of have a spin that makes them rebound at different angles and can cause echoes.

"The house also had to be bigger than it should be. We finally figured we had to make room for 3800 seats — the opera isn't subsidized in this country — when 3000 seats is ideal for an opera house.

"I could have experimented, I suppose. There have been modern opera houses built since the war. But the bigger the involvement, the less real room there is to experiment. I just couldn't go off into the realm of theory with a building like this. You just can't experiment with $45 million." *Wallace K. Harrison, in* The New York Times Magazine.

"He wore billowing silk shirts of lavender and apple green to the office. He paid dentist bills for dozens of chorus girls because he could not bear ugly teeth." Aline Saarinen, writing of Stanford White in *Life*.

# WASHINGTON/FINANCIAL NEWS

BY E. E. HALMOS

Architects and urban planners will soon be dealing with a new, and to some extent undefined, set of conditions in planning projects to be built in or near the flood plain of a stream.

The change will be the result of a little-noted Presidential order (No. 11296), which directs all Federal agencies, including the Housing and Urban Development Department, Small Business Administration, Water Pollution Control Administration, as well as more traditional construction agencies, to disapprove any construction in a flood plain that is "uneconomic, unnecessary, or hazardous." The all-inclusive order notes that the consideration of flood hazard will affect any work in which Federal funds are involved in any way—by direct grant or loan, mortgage insurance, or anything else.

Background on the move dates back more than six years, when the Army's Corps of Engineers sought (and was denied) Congressional authority to block construction in flood-plain areas; it also stems from Administration efforts to take a posture of economy. Since 1936, the Corps and the Soil Conservation Service has spent more than $7 billion on flood control and flood-prevention work; it now spends an average of $500 million a year for this purpose. Complaint is that developers and city planners insist on building in flood-prone areas, then demand, and get, Federal work to protect these areas. Every time the Federal Government builds a levee or flood wall, more building goes up behind it, with the result that a record flood brings more damage and more demands for protective works. Besides, says the Corps, building in the flood plains increases danger of disastrous floods, since it restricts natural water-courses.

Under the order, requests for funds for projects in such areas must be accompanied by written "findings" by agency heads that no danger exists — or funds will be denied.

The order, unfortunately, fails to clarify a couple of important points: (1) there are no national criteria of flood danger, not nearly enough information on many streams to set such criteria; (2) the order doesn't say who in the various agencies will pass on the extent of danger.

**NASA to Study Architectural Fees** — Tucked away in a rider on the appropriations bill for the National Aeronautics and Space Agency is a matter of major concern to architects: call for a year-long study as to whether the present 6% limitation on architectural and engineering fees is too low.

NASA had requested a one-year waiver of the 6% limitation on certain advanced and complex projects. Congress didn't permit that, but it did direct the Comptroller General to make a Government-wide review of the subject and report back within a year.

Professionals have long complained that the fee limitation, coupled with too-low Federal construction cost estimates, has made it necessary to reject assignments; they have argued, on the other hand, that adequate (or above-average) fees can result in savings by permitting comprehensive solutions with simplified construction.

An immediate participant was the Consulting Engineers Council, which sent out a call to its members for data to illustrate specific instances where hardships have been created because of the 6% limitation.

**Running Amok in the Capital** — To nobody's surprise, Congress charged right back down Capitol Hill in mid-August, and approved a compromise appropriations bill that will permit the Architect of the Capitol to continue preliminary design planning for extension of the Capitol's West Front.

Thus, predictably, another annual skirmish over the construction and appearance of the building ended just where the powerful "Commission on Extension of the U.S. Capitol" wanted it to: with a start on the work of extending the old building's crumbling West Front some 80′ outward, to create new office, committee room, and restaurant space at a cost of at least $34 million.

The House-Senate conference committee that worked on the annual "Legislative Branch Appropriations" bill, in which are contained funds for the Architect's office, was careful to disclaim responsibility. Said Oklahoma's Senator "Mike" Monroney, representing the Senate in the conference: "I believe this is a reasonable compromise [permitting continuation of design planning] that will enable both advocates and opponents . . . to participate in whatever decision Congress eventually will make. . . . This action in no way endorses or rejects the Architect's course of action up to this point."

Monroney went on to explain that Architect Stewart had spent all but $40,000 of some $300,000 given him last year for planning, and that he would use the remaining money mostly for construction of a "mock-up" to show how the building will look when extended. Additional funds for this model, plus other administrative expenses, are provided — but no money for actual construction work.

(Stewart won another victory, somewhat less publicized, when the House Interior Committee adopted an amendment specifically exempting Stewart's 133-acre Capitol Hill domain from a bill aimed at encouraging local efforts to preserve historic sites.)

And while the Capitol furor died down a bit, Washington could look forward to a couple of other architectural points of discussion: a proposal to build a sort of "Ponte Vecchio" — a shop-lined, pedestrian bridge — to connect the city's Southwest redevelopment area waterfront with the almost inaccessible site (across an arm of the Potomac) of the planned, controversial national Aquarium on Haines Point. The 874′-long, 40′-wide bridge, hopefully would be built by private developers, with "minimal" Government participation. There was no fight over this idea; most of the city's architectural critics (some official, some self-appointed) seemed pleased.

But Virginia's Department of Highways, with the cooperation of many metropolitan area planning groups, dropped a bombshell into the already heated argument over how to get commuters into Washington: a plan for a mammoth, 24-lane "spaghetti bowl" interchange just across the Potomac near the Pentagon, to merge almost a dozen lanes of local and through traffic, and handle as many as 180,000 vehicles a day in shifting patterns. Included, on three paved

L-M STYLEKINGS lighting the Grant Park Rose Gardens at beautiful Buckingham Fountain, Chicago, Illinois

# CHOOSE A MELODY OF BEAUTY AND COLOR

## LINE MATERIAL MEDIUM-SOFT ILLUMINATION OUTDOOR LIGHTING

**100-400 WATTS MERCURY • 405-620 WATTS INCANDESCENT**
**4000-20,500 LUMENS • 0.6-1.2 MAINTAINED FOOTCANDLES**

### BEAUTY AND STYLING

You can have just the right accent of styling and color for your next lighting job by choosing from the complete Line Material outdoor lighting line. Ranging from distinct contemporary design through authentic traditional, all L-M luminaires are styled by the noted industrial designer Jean Reinecke to allow you to choose just the right accent for the architectural decor. And the choice of 9 decorator colors lets you pick just the right tone to accent or contrast the surroundings.

### EFFICIENCY AND ECONOMY

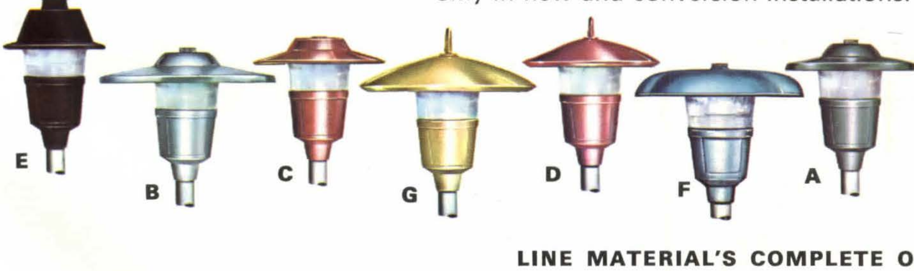
You enjoy efficient illumination with L-M engineered luminaires. You realize low cost installation and maintenance with L-M's standard base fittings and easy, accessible wiring.

### GET COMPLETE SYSTEM

Avoid the problems of multi-suppliers by selecting from L-M's complete line. In addition to luminaires—poles, ballasts, brackets, wiring and power supplies are available from L-M. Your L-M Authorized Distributor, backed by an L-M Lighting Engineer and an L-M Field Engineer, is happy to give you technical assistance.

## STYLEKING (Scale: 1″=3′)

Wide selection of styles plus choice of 9 smart colors to match any architectural decor. Amazing versatility, too, with 7 distinctive cover designs for each base. Luminaires attach directly to pole tops for installation economy in new and conversion installations.




**SPECIFICATION**
Utilizes lamps rated through 250 watts mercury or 620 watts (10,000 lumens) incandescent; constant-wattage, high-reactance, or constant-current ballasts; IES Types I, I-1 way, II, II-4 way, III, IV and V distributions; 3-inch and 7-inch mounting fitters; photocontrol accommodation for Styles A, B, C, and F units.

**LINE MATERIAL'S COMPLETE OUTDOOR LIGHTING LINE ALSO INCLUDES HIGH, MEDIUM AND SOFT ILLUMINATION.**

TURN PAGE

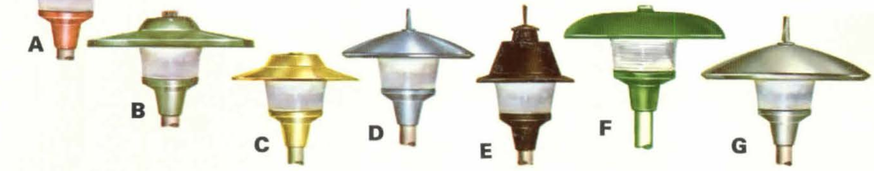
# ADD STYLING AND COLOR TO YOUR JOB FROM L-M'S MEDIUM-SOFT ILLUMINATION LINE . . .

*FOR DRIVEWAYS • MALLS • PARKS • WALKWAYS • POOLS AND RECREATIONAL AREAS • MOTELS SCHOOLS • CHURCHES • STATION PLATFORMS • BUILDING ENTRANCES • RESIDENTIAL AND BUSINESS STREETS*

**100-400 watts mercury • 405-620 watts incandescent • 4000-20,500 lumens • 0.6-1.2 maintained footcandles**

## STYLETTE (Scale: 1″=3′)

Modern styling plus application versatility with 7 designs and choice of 9 decorator colors. All the distinctive covers are interchangeable with the uniform base style for varied decors. Pole top mounting for 3-inch diameter poles adds installation economy.




**SPECIFICATION**
Designed to operate incandescent lamps rated 405 watts with glass refractors; IES Types I, I-1 way, II, II-4 way, III, IV, and V distributions; 3-inch mounting fitter; built-in photocontrol.

## STYLESHIELD

(Scale: 1″=2′)

Distinct, modern design combined with superior lighting performance. Available for mounting on 2-inch supports or davit poles with a 2-inch tenon. Furnished with a choice of 9 decorative colors.

**SPECIFICATION**
Available for use with 400-watt mercury lamps; IES Types, II, II-4 way, III, and IV distributions; photocontrol accommodation.

## STYLED SUBURBANAIRE

(Scale: 1″=2′)

Fresh, modern appearance plus economical, quality lighting. Features open refractor that reduces dirt and moisture accumulation. Mounts on 1½-inch pipe support. Available in a choice of 9 decorative colors.

**SPECIFICATION**
Utilizes 405-watt to 620-watt incandescent lamps and 100-, 175-, or 250-watt mercury lamps; high-reactance or reactor ballasts; IES Types I, I-1 way, II, II-4 way, III, IV, and V distributions; built-in photocontrol receptacle.

FOR COMPLETE INFORMATION on Line Material's line of outdoor lighting contact your L-M Distributor or write Line Material Industries, Milwaukee, Wisc. 53201.


## TRADITIONAL LAWN-GLO®

(Scale: 1″=2′)

Combines charm and styling of Early American whale oil lantern with efficient, controlled illumination. Constructed of cast aluminum, with shatterproof acrylic plastic refractor, for long lasting beauty and minimum maintenance. Available in black or white with gold finial, roof, and refractor clips.

Wall Mounted

**SPECIFICATION**
Accommodates 100-watt mercury lamp and high-reactance ballast, incandescent lamps through 150-watts; mounts on standard 3-inch OD yard light post; available with or without photocontrol.

## UNISTYLE

(Scale: 1″=2′)

Superior lighting performance combined with efficient, modern appearance. Designed for 1¼-inch or 2-inch supports. Furnished with aluminum finish. Provides installation economy with one-piece lower housing, internal ballast and leveling assembly.

**SPECIFICATION**
Available for use with 100-, 175-, 250-, or 400-watt mercury lamps; internally mounted constant-wattage, high-reactance, reactor or constant-current ballasts; IES Types II, II-4 way, and III distributions; built-in photocontrol receptacle.

## LAWNAIRE

(Scale: 1″=2′)

Contemporary styling combined with application flexibility. Available in a choice of 9 decorative colors. For mounting on 3″ OD pipe.

**SPECIFICATION**
Available for use with 75-, 100- and 175-watt mercury lamps; internally mounted high-reactance ballast; IES Types II, IV and V distributions; built-in photocontrol.



**LINE MATERIAL® INDUSTRIES**
McGRAW EDISON
McGRAW-EDISON COMPANY

levels, would be some 27 bridges of varying lengths, miles of steel and concrete — and a price tag of $30 million.

Immediate concern of architects was the impact of such a vast area of roadway, on many levels, on the attempts to beautify and dignify approaches to the capital.

• **Financial** — Congressional attempts to pump new money into the housing field through a nearly $4 billion infusion of funds to "Fannie Mae," the Federal National Mortgage Association, were being watched carefully by a housing industry that expected to see no more than a million or so "new starts" this year. Problem of tight money wasn't affecting builders so much in their own financing as it was in that prospective buyers have balked at skyrocketing interest rates on their borrowing.

• Nevertheless, the general public doesn't seem to be too frightened of the future: Census bureau estimates of "buying intentions" of U.S. citizens (as of mid-July) showed little change in plans, over the past three months, in purchasing such varying commodities as automobiles and household goods.

• Certainly, taxpayers were continuing their strong support of public works spending. The Investment Bankers Association said that, in July, voters approved 83.6% ($50,400,000) worth of construction bonds, turned down only 11 proposed bond issues. Bulk of the new money voted ($21 million) will go into educational work.

• Census further pointed out that, also in July, the value of total new construction put in place was $7,200,000,000 — up about 6% from the previous year. Significantly, private construction was clocked at $4,750,000,000 — up about 5% from a year ago; but public construction, at $2,400,000,000, was up 11% over the previous year.

• Drop in housing was dramatically illustrated: In July, new starts were at a seasonal rate of only 1,064,000, compared to 1,473,000 a year ago.

# PRODUCTS

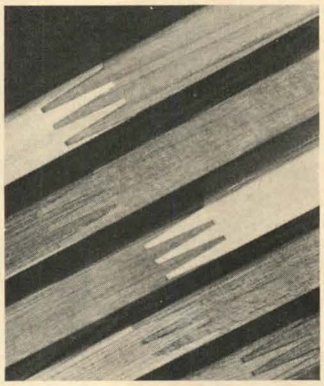
## AIR/TEMPERATURE

**Radiant-heat drywall ceiling system** consists of a single layer, $\frac{5}{8}''$ gypsum wallboard with electric heating cables embedded in fireproof gypsum cores. "Gold Bond Rayboard" systems are installed with conventional wallboard hanging techniques. Each heating panel is a self-contained unit, available in seven models and three sizes. National Gypsum Co., Dept. RM-1, Gold Bond Building, Buffalo, N.Y.
*Circle 100, Readers' Service Card*

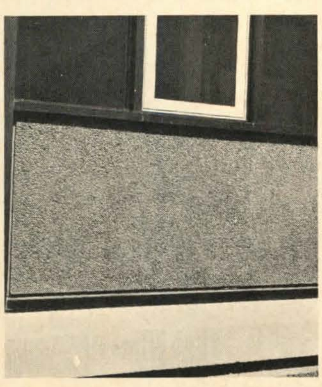
## CONSTRUCTION

**Prefab roofing system** of interlocking metal sheets conceals fastenings and drain channels. Aluminum, copper, Monel metal, or stainless steel may be used for the system, suitable for new construction or re-roofing. Vertical seams are flush with sheet surfaces and form a combination drain channel and hairline expansion joint. Horizontal seams have a standard height of ¾". Suitable for roofing over decks of concrete, wood, or steel with insulation. Overly Mfg. Co., Architectural Metal Products Div., 574 W. Otterman St., Greensburg, Pa. 15602.
*Circle 101, Readers' Service Card*

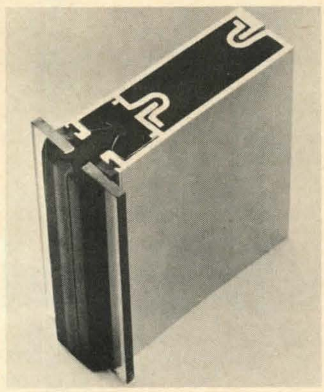
**"Duroflash,"** a dead soft stainless steel (no springback), can be easily bent, cut, nailed, and soldered. The Type 304 soft stainless has been developed for flashing and is said to be less expensive than "scarcer flashing metal." Widths up to 36" available in coils and in cut lengths; in 26, 28, and 30 gage — or in special-order sizes. It needs no coating and is available in two finishes. Samples available. Republic Steel Corp., 224 E. 131 St., Cleveland, Ohio 44108.
*Circle 102, Readers' Service Card*



**"Noyo Finger-Joint"** redwood lumber eliminates the waste of trimming random lengths at the site — exact lengths (up to 24'), widths and thicknesses can be factory-cut. This is said to be more economical for jobs where long fascias or sidings are needed. End-glued joints are smooth and accept paint as well as surrounding redwood, manufacturer states. Available unfinished or factory paint primed. Union Lumber Co., 620 Market St., San Francisco, Calif. 94104.
*Circle 103, Readers' Service Card*

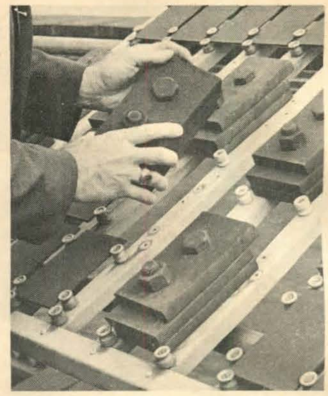


**Exposed aggregate** concrete, bonded to foamed insulation backed with metal, forms lightweight curtain-wall panels. Maximum size of standard concrete unit is 3'-9" x 9'-9" x 1¾" thick, and weighs approximately 15 psf; weight and thickness may vary with the aggregate. Cast in a seamless steel pan with 1" of rigid Styrofoam insulation, the panel has a "U" factor of .20. Edges of pan embedded in the concrete are unexposed on the exterior; metal surface may be painted for interior finish. Schokbeton Products Corp., 1270 Ave. of the Americas, New York, N.Y. 10020.
*Circle 104, Readers' Service Card*



**"T-Wall" framing system** insulates glass from metal mullions in curtain walls with T-shaped gasket and filler strips. Gaskets are pressed into continuous stainless-steel spring clips that pull the glass against filler strips fitted into mullion slots. This insulation results in a "U" value of 0.6, according to manufacturer, and no condensation with temperatures of -20 F outside, 70 F inside, and 35% relative humidity. New system is suitable for both low- and high-rise buildings. Pittsburgh Plate Glass Co., 632 Fort Duquesne Blvd., Pittsburgh, Pa. 15222.
*Circle 105, Readers' Service Card*

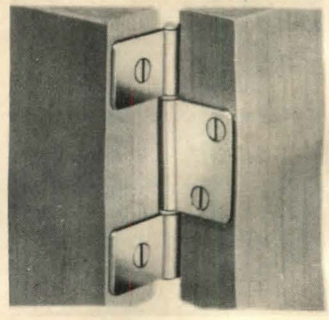
**Concrete block** with integral exposed-aggregate face is available with any one (or a combination) of 15 aggregates. Manufacturer claims good weathering qualities and states that fabricating the aggregate face as a part of the block cuts down on freeze-thaw damage caused from water seepage behind the face. Preco Chemical Corp., 55 Skyline Dr., Plainview, N.Y.
*Circle 106, Readers' Service Card*



**Bolts to match** weathering steel are now available. Maintenance-free "Weather-R" bolts with "built-in corrosion resistance" have been developed for use with manufacturer's "Mayari R" weathering steel, which forms a dark brown textured finish after long exposure. High-strength fasteners meet mechanical and dimensional requirements of ASTM specification A325. Bethlehem Steel Corp., Bethlehem, Pa.

## DOORS/WINDOWS

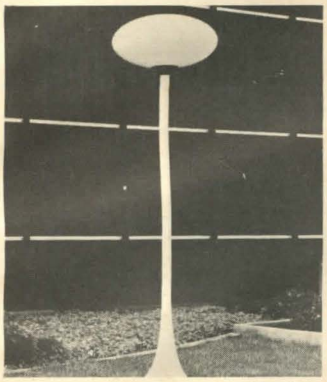
**Movable walls** are now available with coverings of Du Pont's "Tedlar" — a polyvinyl fluoride which "makes vinyls as stain resistant as ceramic tile." Tedlar, laminated to Modernfold's "Soundmaster" or "Acousti-Seal" movable wall surfaces will be optional. Matching wall-coatings will also be available from Moderncote, Inc., the manufacturer's subsidiary. New Castle Products, Inc., 1721 "I" Ave., New Castle, Ind. 47362.
*Circle 108, Readers' Service Card*



**Three-leaf door hinge** needs no mortising and shows knuckles on one side, and only leaf edges on the other. Brass-plated steel hinge, "4741,"

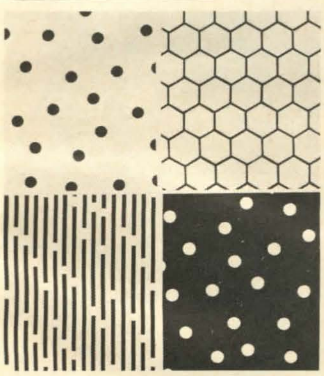
measures $3\frac{11}{32}''$ long by $2\frac{9}{32}''$ wide open. Samples available. Amerock Corp., 4000 Auburn St., Rockford, Ill. 61101.
*Circle 109, Readers' Service Card*

## ELECTRICAL EQUIPMENT

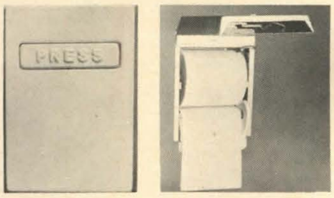


**Plastic ellipsoid** luminaire atop a cast-aluminum pole for outdoor lighting accommodates up to 400-w mercury vapor or 500-w incandescent light. Pole (8', 10', 12', or 14' high) is finished in baked acrylic — white, black, or dark bronze. Luminaire, 34" dia., has built-in reflector. Suitable for parks, campuses, parking lots, street lighting, etc. Kim Lighting, 1467 N. Lidcombe, El Monte, Calif. 91733.
*Circle 110, Readers' Service Card*

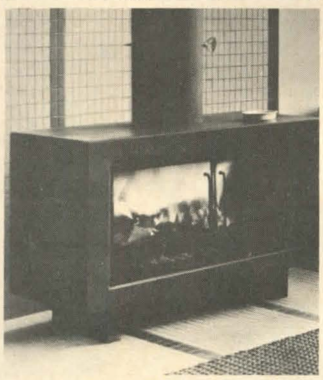
## FURNISHINGS



**Op Art designs** on "Patent Vinyl" create slippery looking upholstery and wall coverings. Designs include "Chickenwire," "Matchsticks," "Polka-Dots" (white on black ground or black dots on white ground), as shown, as well as black and white stripes and solid white or black patent vinyl coordinates. Available too are custom hand prints on any vinyl background. The material is 53/54" and fabric-backed with sateen for added strength. Manufacturers claim a brush will clean it. J. M. Lynne Co., 149 Sullivan Lane, Westbury, L.I., N.Y.
*Circle 111, Readers' Service Card*



**Would you believe** an automatic toilet paper dispenser? Molded of egg-shell white plastic, the device uses "solid state circuitry"; designed for recessed installation, it fits flush with the wall. Just press and tissue rolls out to any desired length. Would you believe the manufacturer claims, "It eliminates unsightly toilet paper"? Advance Design Service, 23280 Gonzales Dr., Woodland Hills, Calif.
*Circle 112, Readers' Service Card*



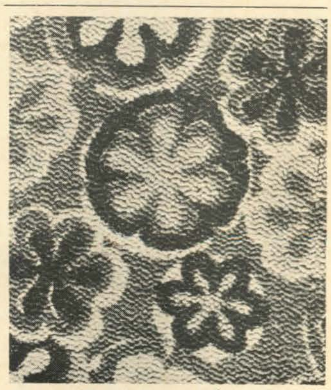
**St. Nick couldn't slip** down into the Manchester Pierce fireplace — a free-standing floor unit to which wall brackets can be added for midwall suspension. Models come with top-mounted vertical chimneys or hidden back flues. Fireplaces are also adaptable to gas log conversion with hearth opening up to 40". Finish is heat-resistant matte black. Condon-King Company, Inc., 5611 208th Avenue S.W., Lynwood, Wash.
*Circle 113, Readers' Service Card*

**Zefkrome,** an acrylic fiber manufactured by the Dow Badische Company, provides maximum color retention for carpets made with it, because its color is added during fiber-making. Manufacturer claims that its colors have richer luster and clearer tone than normally dryed acylics. Odorless when wet, unsusceptible to silverfish and mold, Zefkrome's practicality does not exclude the luxury of choice of weaves and textures. Among carpet manufacturers using Zefkrome are: Hugh Nelson-Columbia Carpet Company; Gulistan Carpets; and Downs Carpet Company. Dow Badische Company, Textile Fibers Department, 350 Fifth Ave., New York, N. Y.
*Circle 114, Readers' Service Card*

**Cool** are the Stellante hinge-door cabinets (shown) and sliding tambour door cabinets by Imperial Desk Company, when turned into refrigerated office furniture. Hinge doors swing out, allowing the refrigerator door to fold down, providing a serving counter. The door panel of the "slip-in" refrigerator can be made of oil walnut, to match the finish of the cabinet (refrigerator 15½" high, 26¾" wide, 16" deep, and with 1.5 cu ft capacity and two ice cube trays, is available at the Sub-Zero Freezer Co., Inc., Madison, Wis.). Cabinet modifications can be made at Imperial upon request. Imperial Desk Company, Inc., 1312 W. Florida Street, Evansville, Ind. 47707.
*Circle 115, Readers' Service Card*

**Roll out the vinyl runner** by Tenex. The transparency of the vinyl allows one to see but not to sully surfaces underfoot. Runners have a nonslip, cross-ribbed surface with a flat, lengthwise center strip. They come with gripper undersides for carpets, and smooth undersides for resilient surfaces (such as tile and marble). Vinyl is available in "crystal clear" and four transparent tints: light blue, gold, green, and beige. Runners come in 36" and 48" widths, and lengths up to 60'. Tenex Corporation, 1850 East Estes Avenue, Elk Grove Village, Ill. 60007.
*Circle 116, Readers' Service Card*

**Hide-'n Peek black glass oven doors** are transparent when the oven light is on, opaque when it is off. Since they are full width and lift off, oven cleaning is facilitated. Handle comes in bright chrome with a decorative walnut inlay. Most gas and electric ovens manufactured by Waste King Universal will accommodate these doors. Waste King Corp., 3300 E. 50th St., Los Angeles, Calif.
*Circle 117, Readers' Service Card*



**Caravelle** is a tight, dense, multicolor carpet designed by Trend Carpet to bear institutional wear. It is constructed of 70% acrylic and 30% nylon, and has a long staple length that is said to eliminate fuzzing or piling. Backing is of polypropylene. Manufacturers claim the carpet is

# Are the bugs out of all plastic flashings? Just one—

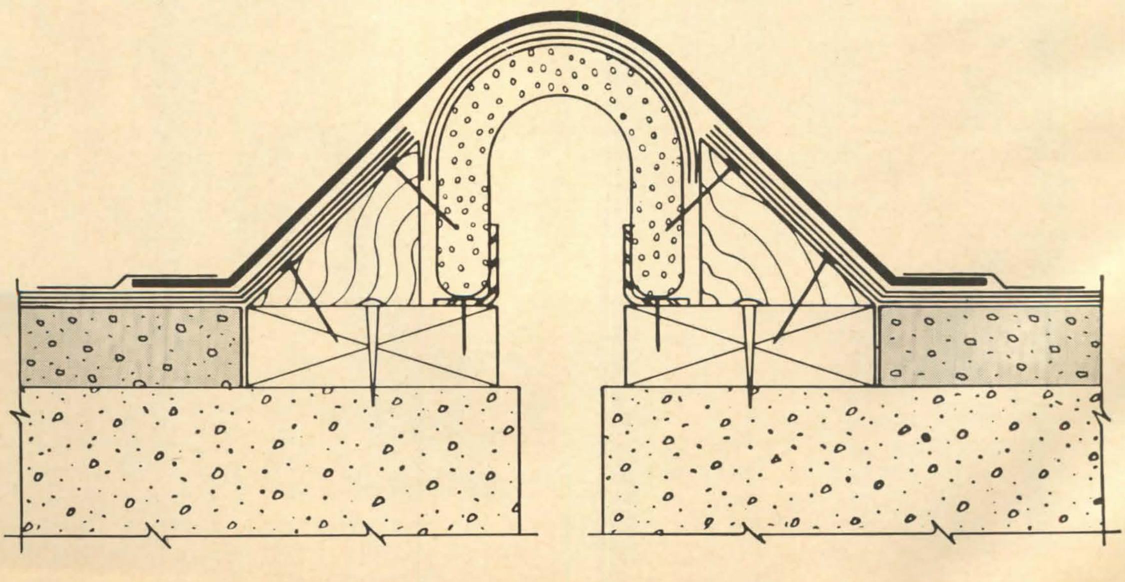
# Saraloy 640R.

There's nothing new about flexible flashing, but perfected flexible flashing —that's new, and Dow has it. For flashing applications that will move, it makes good sense to use a flexible flashing, if the flexible flashing will stand up to extreme heat without weakening and thinning out... and to cold without getting brittle. Saraloy® 640R plastic flashing can.

Another question: will it last? Saraloy 640R will—practically forever. Saraloy 640R flashing is ideal for roof expansion joints, particularly when used in conjunction with Ethafoam® expanded polyethylene foam. (See the detail below.) It makes for a thoroughly waterproof, thoroughly weather resistant expansion joint that will last, the life of the roof.

By the way, the contractors like it, too, because it's solvent weldable and so easy to handle and install. Want more information about Saraloy 640R... perfected flexible flashing? We have it for you. Write The Dow Chemical Company, Plastics Sales Department, Midland, Michigan 48640. Or consult Sweet's Architectural File 8g/Do.

DOW



On Readers' Service Card, Circle No. 351

mildew proof and nonallergic. It is available in designs (with color combinations toned gold, olive, blue-green, moss [brownish], burgundy, and heather) and in tweeds. Trend Contract, 866 United Plaza Building, New York, N.Y. 10017.
*Circle 118, Readers' Service Card*

**For indoor cooking, outdoor style,** Mark Stone has designed "Grate-n Grill," an alloy steel fireplace grate with a removable, hammered wrought-iron grill whose cooking surface is stainless steel. The grate's contour makes self-feeding fuel roll toward the center; it is available in 21", 27", 30" and 36" widths. The grill, 12" x 18", can be used on any grate between 24" and 36" wide. Either part can be purchased separately. Metalex Corporation, P.O. Box 147, Highway 176, Libertyville, Ill. 60048.
*Circle 119, Readers' Service Card*

**Vel-Strips** are Velcro tapes mounted on rigid vinyl strips. When pressed together, the two tapes seal tightly and will support as much as 5 lb shear strength pressure per sq in. The rigid strips, designed for carpet installations, door and wall panels, furniture and drapery installations, and industrial uses, as well as for aircraft interiors and upholstering, can be attached to most surfaces by means of stapling, tacking, or riveting. Kirsch Company, Dept. V000, Sturgis, Mich.
*Circle 120, Readers' Service Card*

**Library furniture** by Jens Risom has been augmented by seven tables, study carrels, and three complementary chairs. The tables are rectangular or round and range from single to six places. Shelf units, which are put on top of the same tables to produce separate study carrels or index dividers, are an answer to flexible privacy and storage requirements. Tabletops are of walnut wood, matte bayberry plastic, or Risom vinyl. Carrel shelf is faced with matte walnut plastic. The chairs are both arm and armless designs, with walnut or upholstered backs. Note recessed apron allowing armchairs to be drawn up close. Jens Risom Design Inc., 444 Madison Avenue, New York, N. Y. 10022.

**The Tower of Toujay** by designer Jerry Joseph has four compartments and four doors. Each compartment is 13" high, 19½" wide, 18" deep. Included are a pull-out tray for phono and tape recorder, adjustable shelf, and record dividers. A system of interlocking columns forms the tower's 61"-high frame that comes in teak finish with ebony trim, or walnut and brass. It may be combined with additional units to create a more extensive wall treatment. Toujay Designs, Inc., 146 East 53rd St., New York, N.Y. 10022.
*Circle 122, Readers' Service Card*

**Q-Flood is a wide-beam floodlight,** using a 250-w miniature quartz iodine lamp. It is finished in jet black, bronze (both with black yoke and mounting), and matte white. A deeply recessed reflector reduces glare and spill light. Flow-through convection venting cools the lamp. Available with a variety of mounting devices (among them c-clamp for pipes, screw-in unit for lamp socket), accessory louver, hood, and color filters. Lighting Services, Inc., 77 Park Ave., New York, N.Y. 10016.
*Circle 123, Readers' Service Card*

## OFFICE EQUIPMENT

**Combination developer and printer** for reproducing drawings has added the ammonia system to the developer section. Ammonia control container needs no venting and, after being filled, the "Diazo-Jet" may be left on all day with no further attention. Care and operation of the whiteprinter is said to be simple and clean. Rotolite Sales Corp., Stirling, N.J. 07980.
*Circle 124, Readers' Service Card*

**Private areas** for desk workers in large open spaces are possible with "Quik-Lok" partitioning system — shelving, work surface, and storage cabinets with doors. Units are said to be easily moved and rearranged; no bolting to walls or floors is required. A selection of colors is available. Aurora Steel Products, 153 Third St., Aurora, Ill. 60507.
*Circle 125, Readers' Service Card*

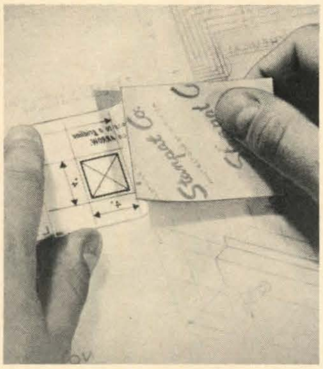
## SANITATION PLUMBING

**For grand wazirs** and other fun-loving people, the "Versa/Tub" offers another possibility for bathroom luxury. It is a 5′ apronless, enameled cast-iron tub that can be sunk flush with the floor, raised or installed as shown here. It can be faced on any or all sides with ceramic tile, wood paneling, etc. Rheem Mfg. Co., 7600 S. Kedzie Ave., Chicago, Ill. 60652.
*Circle 126, Readers' Service Card*

**Safe-shower fixture** guards bather against sudden bursts of hot or cold water. Thermostatic shower-bath control will not deliver water above 115 F even if cold water supply fails, and will maintain any desired temperature from 65 F up to 115 F. One moving part —

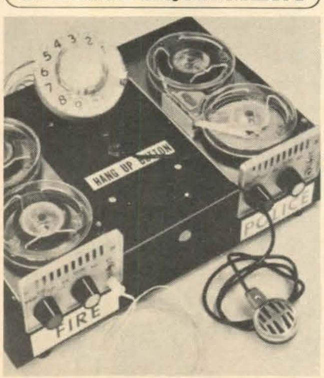
thermostatic motor and mixing valve assembly — is said to be easily accessible from the front. The Powers Regulator Co., Skokie, Ill.
*Circle 127, Readers' Service Card*

## SERVICES



**Transparent scheme** for saving drafting time uses adhesive-backed, tri-acetate sheets for preprinting repetitive symbols, title blocks, or standard details. Matte surface will take erasures, and adhesive backing is either "permanent" or "temporary." Custom order "Stanpats" are prepared from clients' artwork, but a typesetting service is available from the manufacturer. Plain sheets (8½" x 11") are also available for do-it-yourself printing on a 914 Xerox; this reproduction is said to be clear, with no ghosting. Stanpat Products Inc., Covert and Main Sts., Port Washington, N.Y. 11050.
*Circle 128, Readers' Service Card*

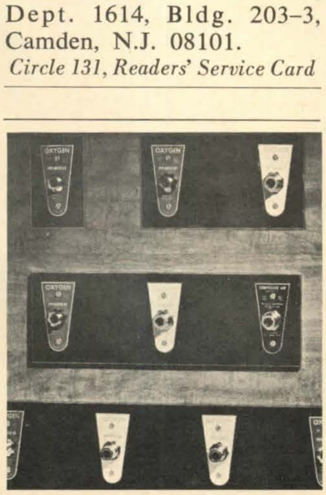
## SPECIAL EQUIPMENT



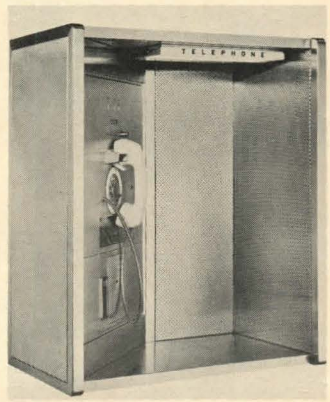

**"Attention** — an emergency message follows" . . . says the Dialalarm, which will automatically call emergency help should a piece of machinery fail, or a fire start. Wired into existing security systems, it will, for example, automatically call police and deliver its prerecorded message if a building is entered forcibly. The same unit will also call the fire department when activated by fire or smoke. It can also be used manually. Nite-Day Fire Protection Co., 7315 Lankershim Blvd., No. Hollywood, Calif.
*Circle 129, Readers' Service Card*

**Patterned screens** conceal rooftop equipment. Eight textured patterns in 12 lively colors, plus black and white, are molded into glass-fiber panels 4' x 8' with built-in mounting frame. Opaque colors are impregnated; panels are said to be fire-resistant. For access, hinged panels are available. Special designs and forms, for uses such as in ventilators, can also be fabricated by manufacturer for dressing up the rooftop mechanical garden. Color chart available. Williams-Bermuda Corp., 914 Westminster Ave., Alhambra, Calif. 91803.
*Circle 130, Readers' Service Card*

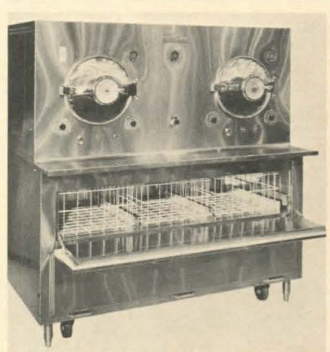
**Control console** for paging and radio sound distribution has AM/FM tuner and 10-station switch bank for zone paging. Compact unit is designed for central location such as front desks in motels or hotels. RCA Service Co., Dept. 1614, Bldg. 203-3, Camden, N.J. 08101.
*Circle 131, Readers' Service Card*



**"Flushplate" service outlets** for hospitals provide oxygen and suction connections. Single or multiple plates are also available with electrical outlets, nurse calls, etc. Since stainless steel is frequently not required outside critical areas, states manufacturer, standard units are black epoxied aluminum — with special-order colors available. Melchior, Armstrong, Dessau, Medical Equipment Div., Ridgefield, N.J. 07657.
*Circle 132, Readers' Service Card*

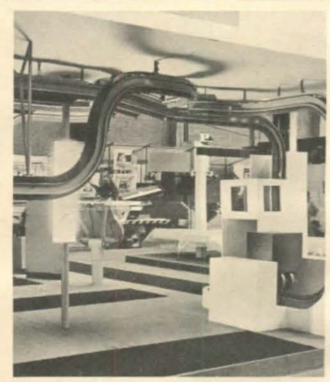



**Compact phone "booth"** is all stainless steel, including perforated acoustical side panels. Shelf unit accommodates the Bell System 235G Panel Telephone mounted either on the left (40-S) or on the right (41-S). Dimensions: 24" wide x 30½" high x 14⁵/₁₆" deep. Suitable for lobbies, department stores, etc. Manufacturer plans to offer a variety of side-panel finishes and various accessories. Acoustics Development Corp., 1810 Holste Rd., Northbrook, Ill. 60062.
*Circle 133, Readers' Service Card*

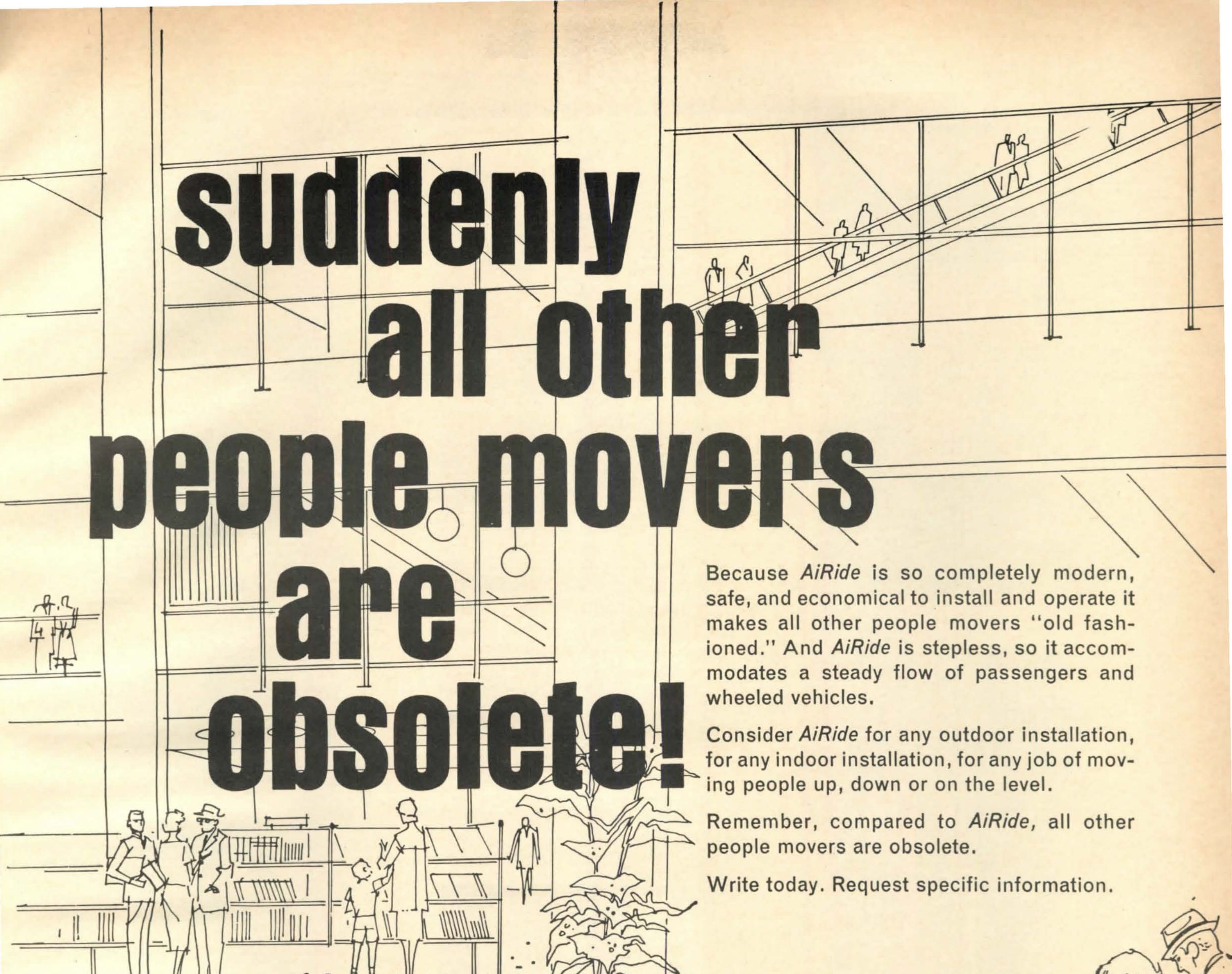


**Cooker-freezer** meets mass-feeding needs by cooking 40 lb of vegetables every 5 min or heating 48 frozen entrees every 6 min. Directly under the two steam cooking compartments ("400 steam jets impinging directly into the food mass for dynamic cooking action") is a 300-lb capacity freezer. The "2285-FC" virtually eliminates the need for pots and pans, and requires no ventilation system, claims manufacturer. Vischer Products Co., 2815 W. Roscoe St., Chicago, Ill. 60618.
*Circle 134, Readers' Service Card*

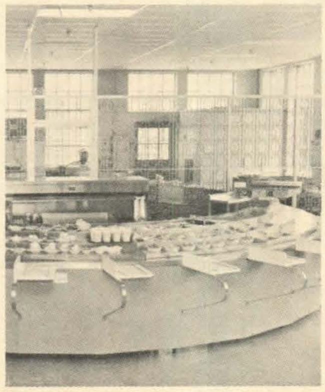
**Where there's smoke,** this small ($6^7/_{16}$" dia. x $2^7/_8$" deep) detecting device sets off the alarm. It protects an area up to 60' x 60', and can be added to existing fire-protection systems. When smoke reaches the 4% "obscuration" point, it reflects lights to a photocell, triggering the transistorized alarm relay; temperatures of 135 F or over also start alarm. Device is valuable in protecting sensitive people (the elderly or ill) and sensitive equipment. Notifier Corp., 3700 N. 56 St., Lincoln, Nebr. 68504.
*Circle 135, Readers' Service Card*



**A monorail conveyor** suitable for hospital use can automatically discharge containers at programmed stations. The system, which has been operated in Swiss hospitals, conveys 220-lb-capacity containers that remain upright while moving in horizontal or vertical directions, and are stabilized to prevent oscillation. The system should ideally be designed into the original plans, but installation is possible in existing elevator shafts or corridors. Suitable for transporting such items as laundry, medical records, test specimens, drugs, trash, etc.

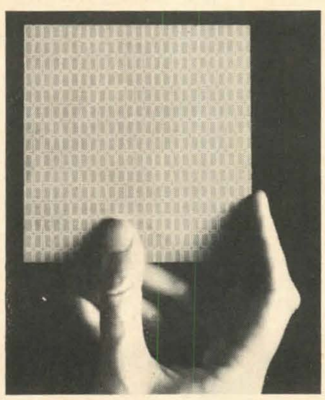

suddenly
all other
people movers
are
obsolete!

Ritter Pfaudler Corp., 110 Midtown Tower, Rochester, N.Y. 14604.
*Circle 136, Readers' Service Card*



**Rotary food serving counters** carry food to customers, who stand still until served. The large model can serve 1000 persons an hour, says manufacturer. Also, the system saves space and size of staff compared with straight counters. The Kayway Co., 3047 Madison Rd., Cincinnati, Ohio 45209.
*Circle 137, Readers' Service Card*

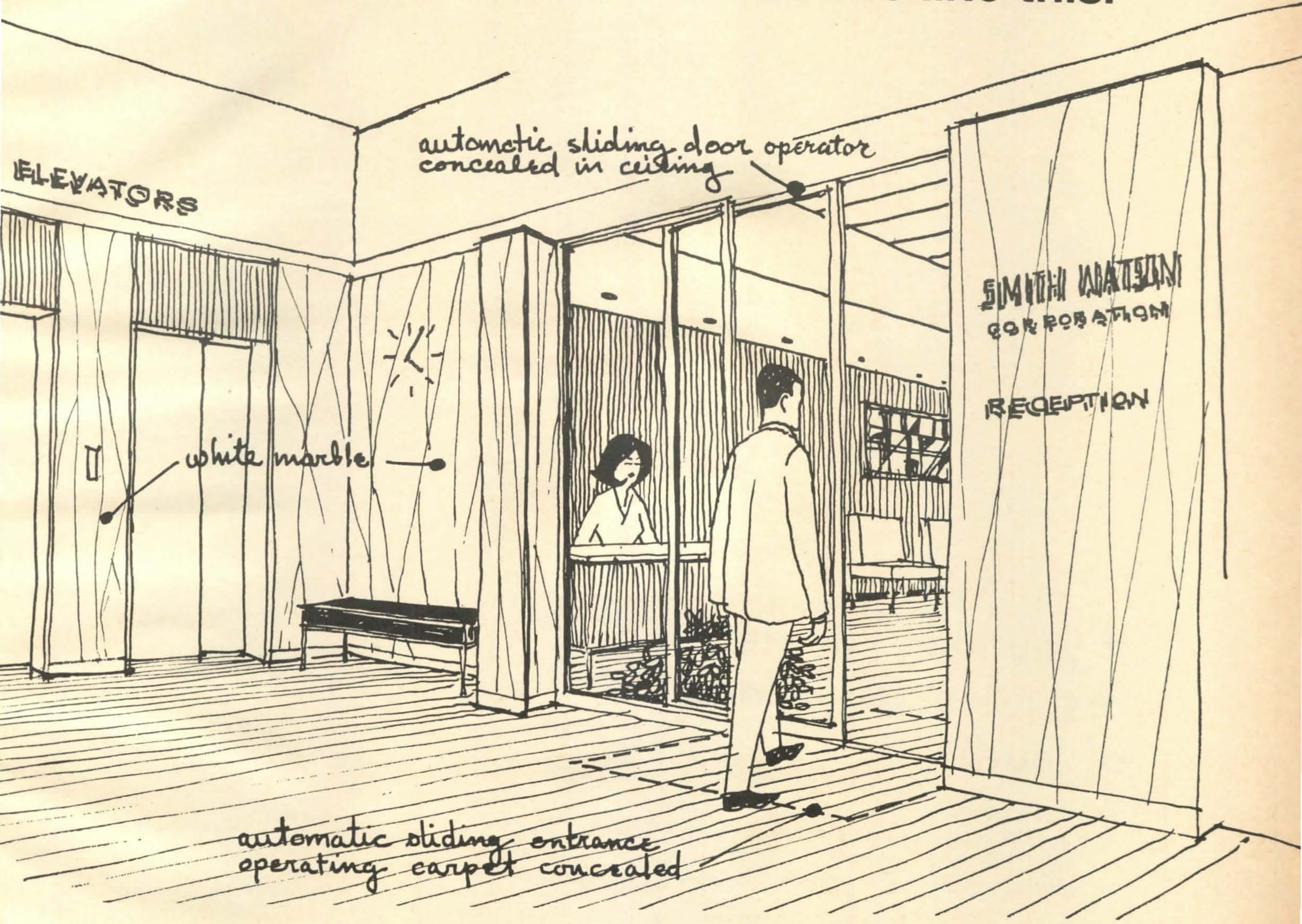
### SURFACING



**Three fine-line patterns,** designed for Micarta laminates by architect Eliot Noyes, are all based on the grid — a fine mesh, a slightly larger pattern of geometric shapes, and a "window" pattern, the largest of the three (shown). They are printed on 12 solid-color backgrounds, also developed by Noyes. Manufacturer suggests wall, door, counter, and other applications in restaurants, on ships, in hotels, etc. Matching abutting sheets should not be a problem, says manufacturer, since the designs are sufficiently irregular to allow for flexibility. Westinghouse Electric Corp., Micarta Div., Hampton, S.C.
*Circle 138, Readers' Service Card*

## Who helps you to say "Welcome" impressively?

## Stanley does.
## With automatic entrances like this.




The people you design offices for want doorways that create favorable first — and lasting — impressions. Get information on Stanley automatic sliding entrances. Write us for Folder No. M67-COM. Look us up in Sweet's. Or check under "Door Operating Devices" in the Yellow Pages for the name of the Stanley distributor nearest you. Stanley offers a complete line of famous MAGIC-DOOR® operators (pneumatic, hydraulic, electric), controls and accessories for doors that swing, slide or fold.
Stanley Door Operating Equipment, Division of The Stanley Works, New Britain, Connecticut.

THE STANLEY® WORKS

CONSULT YOUR NEAREST MAGIC-DOOR DISTRIBUTOR LISTED AT LEFT

On Readers' Service Card, Circle No. 465

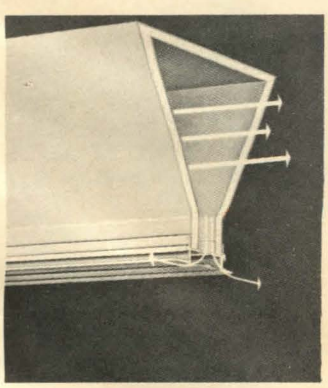
# MFRS' DATA

## ACOUSTICS

**A quiet hour** in one's own "castle" is not an easy thing to come by in many new apartment buildings. A revised booklet on "Silent-Cor" sound-dampening board shows a number of simple cross-sections for wood and steel stud partitions and wood joist floors that cut down airborne noise transmission with varying degrees of efficiency. Short descriptions of physical, acoustical, and fire properties; installation instructions. 12 pages. Monsanto Co., Dept. 804-A, 800 N. Lindbergh Blvd., St. Louis, Mo. 63166.
*Circle 200, Readers' Service Card*

**Revised edition** of noise control manual, "Sound Advice," includes 17 new gypsum wall assemblies plus updated information on previous partition constructions. Cutaway views detail wood or steel stud, gypsum-rib, or solid partition systems. Fire ratings and Sound Transmission Class (STC) ratings are given for each of 32 assemblies, together with additional sound transmission data and charts, materials lists, and application details. 36 pages. Bestwall Gypsum Div., Georgia-Pacific Corp., 2 Industrial Blvd., Paoli, Pa. 19301.
*Circle 201, Readers' Service Card*

## AIR/TEMPERATURE

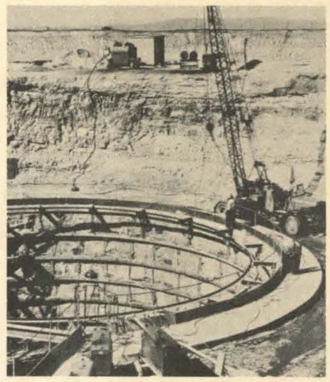


**"Concepts on the Interior Environment"** is a brochure describing integrated ceiling arrangements possible with the manufacturer's components. The backbone of all the systems is the "Modu-Flo" air bar — a slot with an adjustable bar controlling air direction by blades concealed above the ceiling in a triangular insulated duct. Seven systems are illustrated with photos, cutaway views, dimension charts. General component details; air-flow diagrams; cfm, throw, and sound-level charts. 24 pages. Sunbeam Lighting Co., 777 E. 14 Place, Los Angeles, Calif. 90021.
*Circle 202, Readers' Service Card*

**High-pressure** air-conditioning unit for central systems is available in a variety of capacities between 2300 and 38,100 cfm. Booklet illustrates features of "Seasonmaster" units, recommends steps for sizing an installation, tabulates performance, dimensions equipment, and provides brief specs. 28 pages. McQuay, Inc., P.O. Box 1551, Minneapolis, Minn. 55440.
*Circle 203, Readers' Service Card*

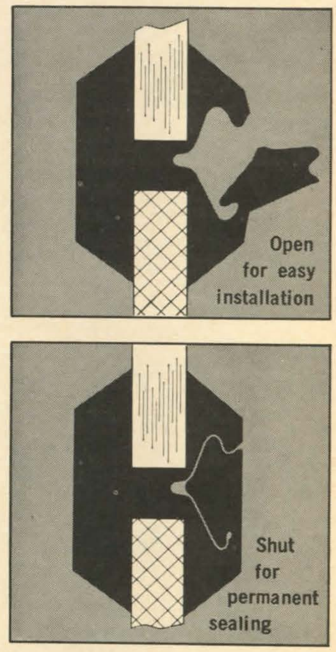
## CONSTRUCTION


**Reinforced concrete manual** (1966 edition) contains data for specifications writers, designers, and detailers, as well as engineering students and contractors. Standard industry codes of practice, estimating data, and contract information are included. Gives specifications for placing bars and bar supports for one-way flat slab and two-way flat slab and flat plate construction. Design case studies offer data on one-way joist construction and two-way waffle slabs; R/C duct floors and metal lath ceiling construction are specified, and standard specs for various types of steel bars are given. "A Manual of Standard Practice for Reinforced Concrete Construction" conforms to ACI and ASTM codes and specifications, and to U.S. Department of Commerce recommendations. Charts, tables, design data, formulas, specs, cross-sections, etc. 98 pages. Concrete Reinforcing Steel Institute, 228 N. LaSalle St., Chicago, Ill. 60601.
*Circle 204, Readers' Service Card*



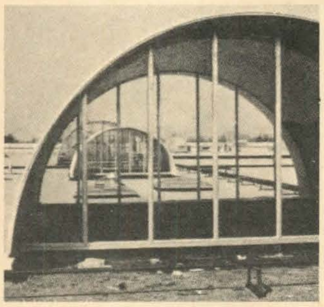
**Concrete admixtures** are discussed in three booklets. "Facts About Placewel" (F–41386, 8 pages) describes how an air-entraining agent increases strength and workability of concrete while using less water; short specs, photos and graphs showing test results. Second pamphlet on Placewel (F–41387) is a more complete, 16-page study of performance tests, including a comparison table. "Facts About Retardwel" (F-41385, 12 pages) describes a non-air-entraining admixture that helps control setting time and also reduces water requirements. The pamphlet contains charts and graphs, technical data, and photos of installations, including a Titan II missle silo (shown). Union Carbide Corp., Chemicals Div., 30–20 Thomson Ave., Long Island City, N. Y. 11101.
*Circle 205, Readers' Service Card*


**Steel forms** for waffle-slab and one-way joist construction are manufactured by this company in four re-usable types: "Steeldomes" for waffle flat-slab construction; "Flangeforms" for one-way joists; "Adjustableforms," which allow adjustment of joist depth; and "Longforms," one-piece units custom-sized for each project. Size charts, concrete quantity tables, accessory forms, profile sections, eight-page list of completed buildings, and many photos of projects built with the manufacturer's forms, ranging from the Chicago Tribune Tower (1925) to the CBS Building (1965), where a floor was cast every four days. Profile cross-sections, construction photos, and detailing of various ceiling constructions and R/C duct systems. 72 pages. The Ceco Corp., 5601 W. 26 St., Chicago, Ill. 60650.
*Circle 206, Readers' Service Card*




**Glazing gaskets** from the manufacturer of Mason jars and lids-with-a-rubber-ring (the American housewife's canning-time stand-by) are detailed in this brochure. Since the Ball Brothers' first bottle and jar plant in 1880, the company has expanded into other fields, including rubber products; and its neoprene structural gaskets are available for a number of glazing applications. A representative selection is detailed and dimensioned in the pamphlet; several vinyl reglets and neoprene channels are also included. 8 pages. Ball Brothers Co., Industrial Rub-

ber Goods Div., St. Joseph, Mich. 49085.
*Circle 207, Readers' Service Card*



**An arched roof** that spans up to 35′ is said to be comparable in cost to a flat roof. Interlocking, U-shaped, 22-gage steel channels, curved to any radius between 7′ and 50′, will accept insulation with built-up roofing or poured fill. The 6″-wide by 2″-deep sections are curved to radius at the site. Hot dipped galvanized units, with a baked vinyl enamel finish, are available with acoustical perforations or without. Booklet contains architectural, mechanical, electrical, structural, and roofing details, load charts, short specs, and construction photos. 12 pages. Donn Products, Inc., 700 Bassett Rd., Westlake, O. 44091.
*Circle 208, Readers' Service Card*

**Precast concrete planks** for floors or roofs are 4′ wide, 8″ or 12″ deep, and can be cut to required length. Underside of hollow-core "Span-Deck" units is lightweight concrete with a textured acoustical surface. Pamphlets give load/span tables, dimensioned cross-sections, guide specs, brief description of manufacturing process, and construction photos. 12 pages. Blakeslee Prestress, P.O. Box 1809, New Haven, Conn. 06507.
*Circle 209, Readers' Service Card*

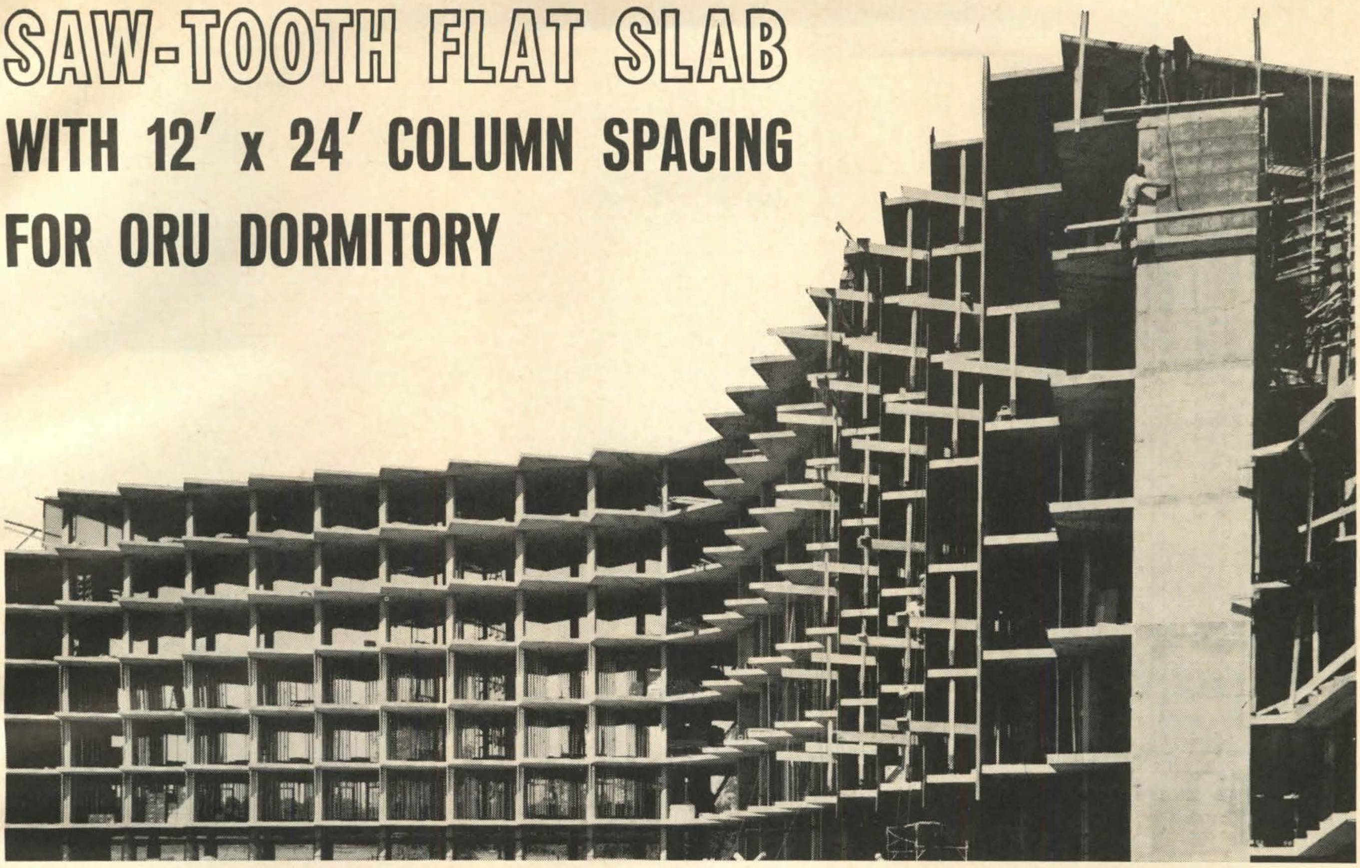
**Greenhouses** for colleges, botanical gardens, and commercial use are framed with standard aluminum components. Available in several profiles with straight or curved eaves in widths from 14′ to 49′, they may be built as free-standing buildings or attached to an existing structure. Manufacturer also offers custom designs and smaller greenhouses for home use. There is an economy series as well as one designed for show appearance. Booklet includes dimensioned drawings and details, size charts, photos, and working drawings. 12 pages. Lord & Burnham Div., Burnham Corp., Irvington, N.Y. 10533.
*Circle 210, Readers' Service Card*

**A walk calk,** two-component pourable polyurethane, is said to cure to a strong rubber with high elasticity and permanent adhesion to the substrate. Calkwalking, or rather walk calking, resists permanent deformation and weathering. Data sheets on "Betaseal #450" give description, application instructions and physical properties. BFC Div., Essex Chemical Corp., Clifton, N. J.
*Circle 211, Readers' Service Card*

**ELECTRICAL EQUIPMENT**

**Hospital lighting** fixtures pivot, swivel, and extend their arms for convenient maneuverability in patients' rooms. Some of the wall-mounted fixtures may be detached and used as hand-held examination lights. Other institutional lighting is also included in catalog, which is illustrated with photos, cross-sections, and

# SAW-TOOTH FLAT SLAB
# WITH 12′ x 24′ COLUMN SPACING
# FOR ORU DORMITORY



The saw-tooth 8″ slabs show clearly; transverse tendons are normal to saw-tooth edge strip.

The floor framing for this Oral Roberts University Dormitory is an 8″ thick prestressed flat slab, post-tensioned using the Prescon System. The saw-tooth floor plan has columns recessed 2′ 10″ in from the re-entrant corner with the teeth of the saw projecting 5′ 3″ from the re-entrant corner. Columns are spaced 24′ transversely and 12′ longitudinally with tendons running diagonally.

The Prescon tendons are spaced on a one to two slope with the transverse column line, with the column strip tendons extending to the tips of the saw teeth. This rotation of the Prescon tendons permitted principal cantilever reinforcement to become part of a column strip for maximum stiffness in the floor. The structural analysis was based upon load balancing applied to a flat plate. In effect, it is a pure membrane analysis. Tendons varied from 3 to 10 wires. In each 12′ increment of floor, 8 tendons running the full width were used and 2 short tendons over the columns. All slabs were cast-in-place with an entire slab completed in a single concreting operation. The average prestress was 300 psi transversely and 150 psi longitudinal. The structure has performed in a most satisfactory manner.

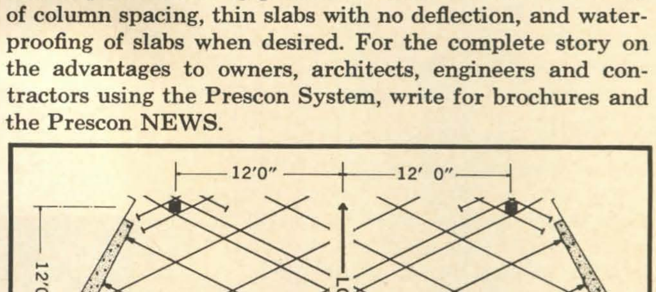
The three wings radiate from a hexagonal 30′ core which houses the elevator, lounge and stairs. Each wing is 40′ wide by 120′ long. Floor-to-floor height is 9′ 4″ except for the ground floor where height is approximately 11′.

This is first of three planned dormitories. Each will be seven levels including the ground floor. Grade level includes lounges, game rooms, etc.; each of the other floors include an apartment for the house mother, laundry and linen facilities, baths and living quarters for 100 students. Floors are carpeted except for terrazzo in toilet areas. The underside of the slab serves as the ceiling and is a sprayed texture coating.

The architect for the project was Frank William Wallace, AIA; engineers were Netherton, Dolmeyer, Solnok; and the contractor was Manhattan Construction Company.



Among the advantages gained by using the Prescon System of post-tensioning prestressed concrete are: flexibility of column spacing, thin slabs with no deflection, and waterproofing of slabs when desired. For the complete story on the advantages to owners, architects, engineers and contractors using the Prescon System, write for brochures and the Prescon NEWS.




The tendons are placed diagonally on a one to two slope to the transverse column direction with the column strip tendons extending to the tips of the saw teeth. Structural analysis was based upon load balancing applied to a flat plate.



*THE PRESCON CORPORATION*

502 Corpus Christi State National Building   Corpus Christi, Texas 78401

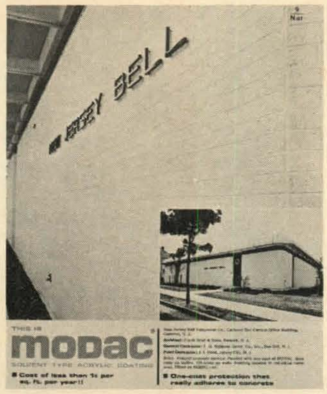
Atlanta • Baltimore • New York • Boston • Chicago • Memphis
Dallas • Houston • Denver • St. Louis • Los Angeles
San Francisco • San Juan • Toronto • Honolulu

MEMBER OF PRESTRESSED CONCRETE INSTITUTE

On Readers' Service Card, Circle No. 418

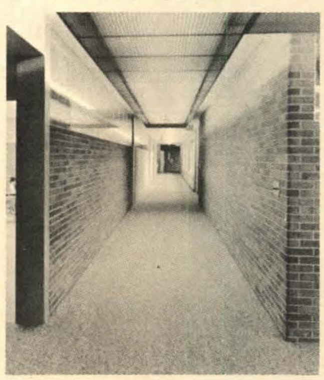
construction data. 32 pages. Luminous Equipment Co., 3750 N. Powell Ave., Franklin Park, Ill.
*Circle 212, Readers' Service Card*

### FINISHES PROTECTORS




**Coating precast or cast-in-place concrete** with one-coat "Modac" protects against weathering, chemical attack, and salt spray. Solvent-type acrylic coating, also suitable for cinder block, brick, stucco, shingles and wood siding, combines good water repellency with improved "breathing." Four-page folder lists test results and short specs. Insert page has color samples. National Coatings Corp., Ohio & Murray Avenues, Atlantic City. N. J.
*Circle 213, Readers' Service Card*

### FLOORING



**A carpet in the classroom** is a practical idea, say carpet manufacturers: They wear just as well as synthetic flooring and are just as easy to clean. Manufacturers of synthetic flooring, of course, dispute this claim, but there is much to be said for it. Bigelow-Sanford, Inc., makes the point in a brochure aimed specifically at the school market — "Bigelow Carpets Go to School." Included are reports on maintenance tests and comparative costs. Dept.

BC, Bigelow-Sanford, Inc., 140 Madison Ave., New York, N.Y.
Jose, Calif.
*Circle 214, Readers' Service Card*

**Cove base** and floor tile brochure gives sizes and color chips. Rubber cove is available in 53 colors — both solid and "marbleized." Rubber tile is marble- or terrazzo-patterned, chip-type, or a recently added 1/8″-thick tile with a travertine pattern (shown). Brochure also illustrates vinyl tiles, and includes floor covering comparison table. 8 pages. Burke Rubber Co., 2250 S. 10 St., San Jose, Calif.
*Circle 215, Readers' Service Card*

### FURNISHINGS

**Ilsa de Sol stoneware** from Puerto Rico is illustrated in a 19-page brochure. Shown are hanging planters and lamps, candle holders, sculptured figures, and vases. Natural ware is an orange-brown that contrasts or blends with a variety of glazes (among them matte turquoise blue, semi-matte lemon yellow). Orders for special designs accepted. Carolina Craft Center, P.O. Box 38, Carolina, Puerto Rico 00630.
*Circle 216, Readers' Service Card*

**Kentile floors** are illustrated in a 27-page color brochure of room settings, which shows the variety of textures available in the line. Tiles are of solid vinyl, asbestos, asphalt, and cork; they come in 9″ and 12″ squares, and as planks measuring 4″ x 36″. Choice of 340 colors and 50 styles. Among available textures are tiles that simulate gravel, especially suited for installation near pools. ("Ripple Chip" looks like stone-chips seen beneath

flowing water.) One amusing idea is pegged cork planking. Catalog also describes products useful for upkeep of various materials. Kentile Floors Inc., 979 Third Ave., New York, N.Y. 10022.
*Circle 217, Readers' Service Card*

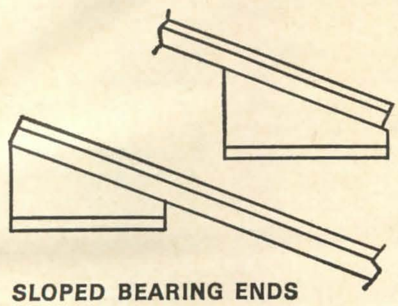
**Visit Italy and France** by placing French terra cotta and Italian quarry tile underfoot. A folding color brochure illustrates 11 imported varieties ("Ecaille Grand," 5⅝" x 6" x ½", resembles fish scales; "Trefles de Provence," 9" x 6½" x ½", brings to mind cool cloisters), each given a rich "Old World" patina by oiling and waxing. Tiles are said to need no maintenance, even when used outdoors in freezing climates. Instructions for installation available. County Floors Inc., 214 E. 26th Street, New York, N.Y. 10010.
*Circle 218, Readers' Service Card*

**Library furniture and equipment** are extensively illustrated in a catalog of almost 100 pages. Eye-catching is a round carrel study table for three (48" or 54" diameter, with 20"-high divider panels). Also, a system of bracket-hung shelving for perimeter or free-standing use called "Delineator." Swatch cards showing range of plastic laminates and baked enamel colors are available, together with specifications booklet. The Weinberg Corporation, Library Division, 145 W. Columbia Ave., Philadelphia, Pa. 19122.
*Circle 219, Readers' Service Card*

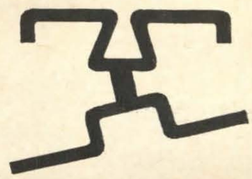
## INSULATION

**Vest-pocket calculator** compares the efficiency of various built-up roofing materials for reducing size and operational cost of heating and cooling equipment. Three common roof-ceiling systems (using gypsum, metal, or concrete decking) are constant; variables are five types of insulation in varying thicknesses. Calculator shows corresponding heating/cooling equipment costs and annual fuel costs. An evaluation work sheet is

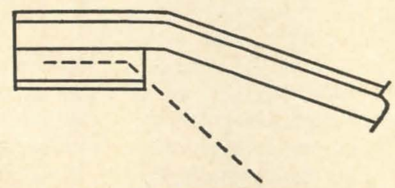
# Macomber does a lot of little things to help architects and builders do a better job...for example:



SLOPED BEARING ENDS

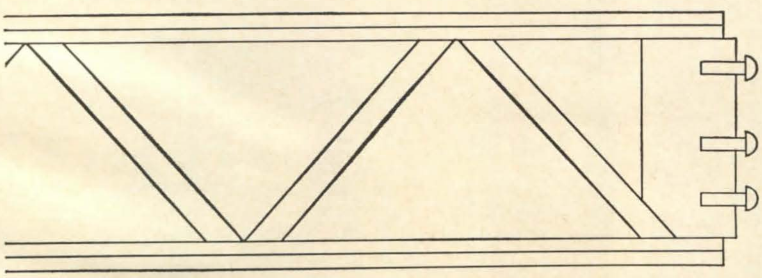


LATERALLY TILTED BEARING PLATES

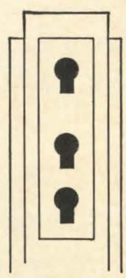


BENT BEARING END

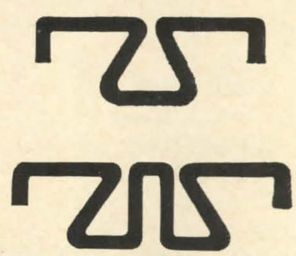
**Macomber representatives can provide architects and builders with more building for their dollar. This is no idle boast, but fact based on thousands of construction jobs. Macomber representatives are experienced building people who work closely with architects and builders in providing their clients with a custom-steel-framed building that exactly suits the need, as well as getting the most usable area from the site. Macomber V-LOK® open-web framing systems have become extremely popular because they combine maximum strength and flexibility with ease of erection. V-LOK can be modified to meet almost any requirement, including the systems approach.**



OPEN-WEB V-LOK GIRDER



SQUARE V-LOK COLUMN



V-SECTION CHORDS

**Prove it to yourself. Talk to the Macomber man in your area and discover how a sturdier custom-steel-framed building can be built to meet any specific style and set of requirements at costs equal to or even below other types, including prefabs. Literature and name of nearest representative upon request.**

MEMBER AISC

**MACOMBER INCORPORATED**

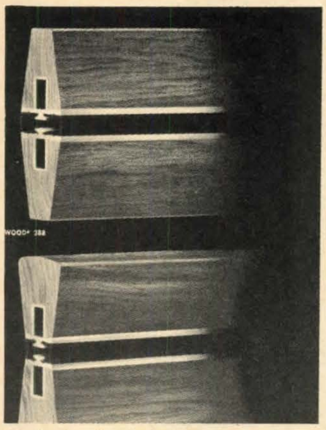
CANTON, OHIO 44701

SUBSIDIARY OF SHARON STEEL CORPORATION

On Readers' Service Card, Circle No. 393

also included. Owens-Corning Fiberglas Corp., 717 Fifth Ave., New York, N.Y. 10020.
*Circle 220, Readers' Service Card*

**SPECIAL EQUIPMENT**



**Balustrades and newel posts** in aluminum and walnut are cataloged in a host of profile designs for post and rail with wood, glass, or grille screens. Low-cost pipe railing systems are also shown. Comprehensive illustrations include both photos and dimensioned details showing railing systems and installation. Short specifications, typical applications, full-size sections, and accessories (rail terminations, brackets, couplings) are included. 170 pages. Blumcraft of Pittsburgh, 460 Melwood St., Pittsburgh 13, Pa.
*Circle 221, Readers' Service Card*

**Ventilated athletic lockers** for school gymnasiums, athletic clubs, and other institutional installations are fabricated from heavy gage steel mesh in 10 baked-enamel colors. Full-length or tiered locker styles are shown with sized drawings, photos, and descriptions. 8 pages. DeBourgh Mfg. Co., 9300 James Ave. South, Minneapolis, Minn. 55431.
*Circle 222, Readers' Service Card*

**Josam interceptors save river and stream** from pollution by oily wastes. Water containing wastes flows through a separating unit where sediment settles in a removable waste bucket and lighter substances, such as oil, rise to the top and are skimmed off through a drain line. 95% of the oils are retrieved and can be reused, reports manufacturer. Specialized information is available from the company's Pollution Control Center whose reference files go back 50 years. Descriptions and dimension charts, suggested layouts for installation in various types of industrial plants. Also installation details. 14 pages. Josam Mfg. Co., Michigan City, Ind. 46360.
*Circle 223, Readers' Service Card*

**SURFACING**

**Two vinyl wall coverings,** B. F. Goodrich's "Koroseal" for Gilford Inc., are displayed with swatches on 2-page color card: "Marked Tree," a filmy cork design in 12 restful pastel and natural shades, one of which resembles birch bark; and "Karachi"—approximating rough-woven burlap, in 20 colors, including quiet bieges, cool greens, warm oranges. Gilford Inc., 387 Park Avenue South, New York, N. Y.
*Circle 224, Readers' Service Card*

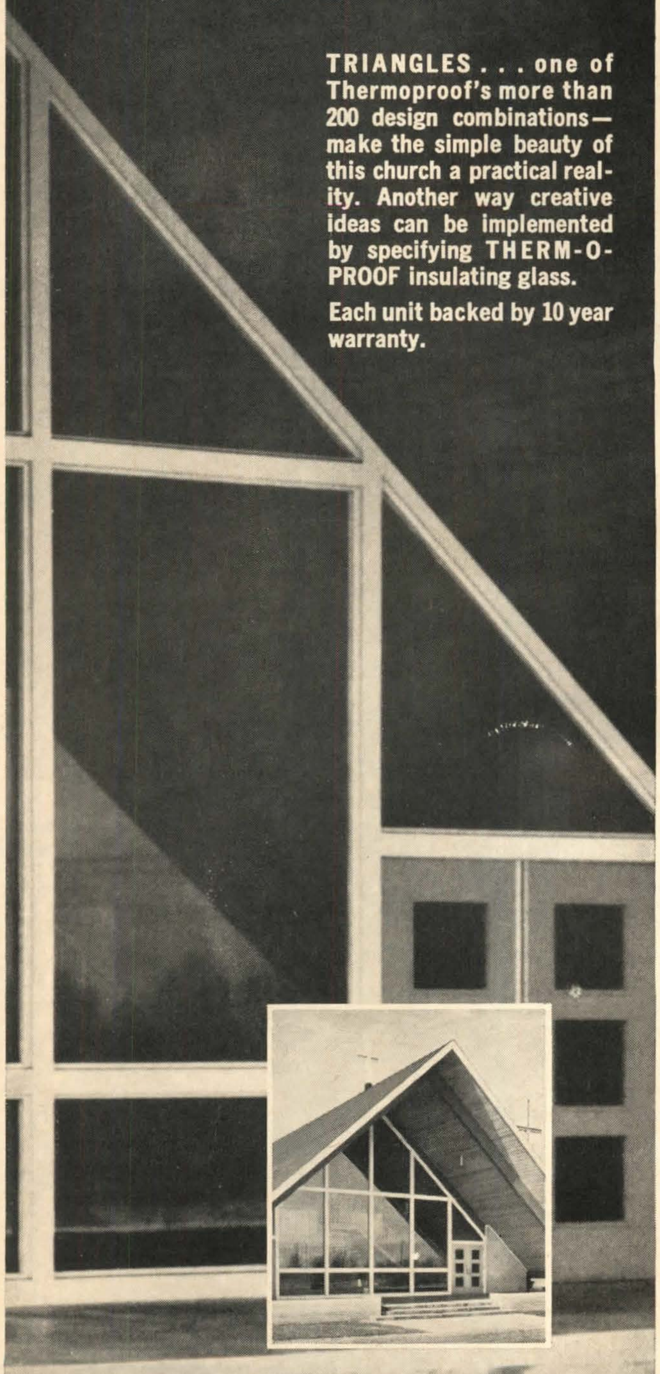
**Geometric clay squares** with surface relief designs are presented for use on interior and exterior walls (water walls, murals, facades, sculptures). Ten basic types of designs are available in a variety of clay colors and stoneware glazes. Close-up as well as over-all installation pictures are included with specifications in 11-page brochure. Design Techniques, 160 East 56th St., New York, N. Y. 10022.
*Circle 225, Readers' Service Card*

PROGRESSIVE ARCHITECTURE
NEWS REPORT
REINHOLD PUBLISHING CORPORATION
430 Park Avenue, New York, N.Y. 10022
Editor ............ Jan C. Rowan
Associate Editor ............ E. K. Carpenter
Publisher ............ P. H. Hubbard, Jr.
Production Mgr. ............ Joseph M. Scanlon

# Triangles . . .
# More design flexibility with Therm-O-Proof insulating glass

**TRIANGLES . . . one of Thermoproof's more than 200 design combinations—make the simple beauty of this church a practical reality. Another way creative ideas can be implemented by specifying THERM-O-PROOF insulating glass.**

**Each unit backed by 10 year warranty.**



Como Community Church, Como, Wisconsin
Architects: Steffen-Kemp & Associates, Inc.
Wauwatosa, Wisconsin

**Therm·O·Proof**
INSULATING GLASS

*Made more ways—*
*to fit more ideas.*

See Sweets $\frac{7a}{Th}$

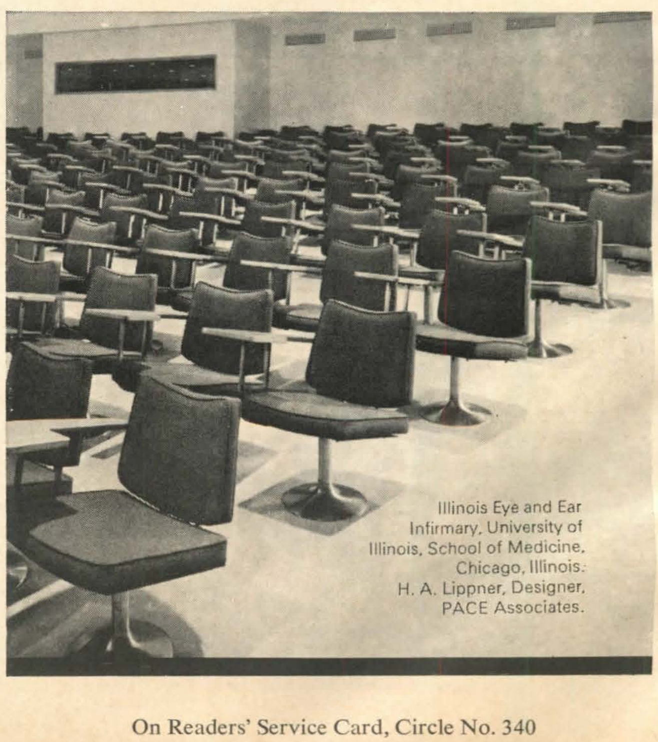
**Thermoproof Glass Company**
**4815 Cabot Avenue**
**Detroit, Michigan 48210**
**subsidiary of**
**Shatterproof Glass Corporation**
**44 years of glass experience**

On Readers' Service Card, Circle No. 440

**this is CHF**

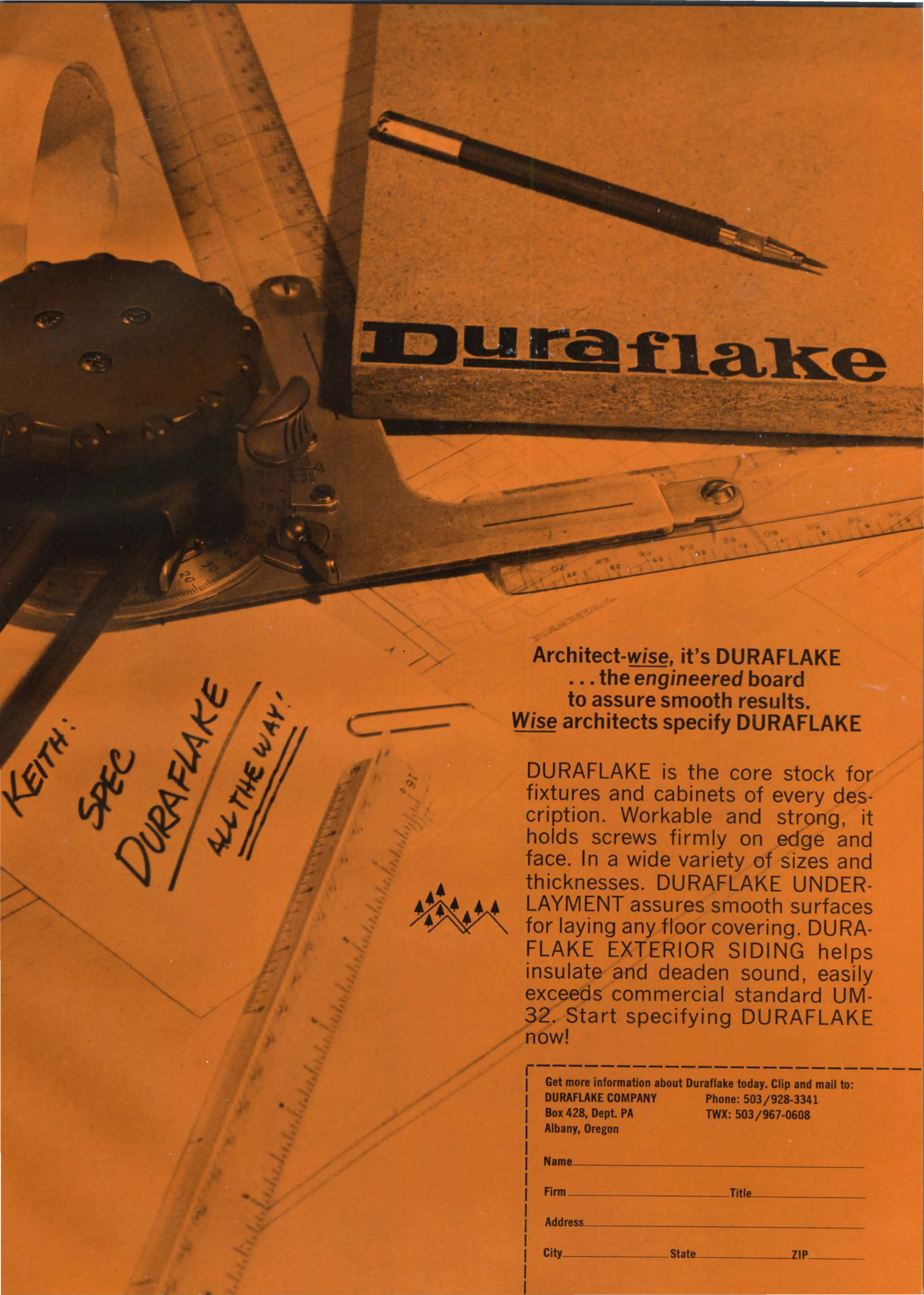
New CHF No. 468 used with 4° bevel mounts on flat, sloping auditorium floor—eliminates need for steps, yet gives each row of seats proper level for visibility and hearing. Another "first" for CHF. For details on new no-step seating for schools, universities and auditoriums, write CHF 468, Chicago Hardware Foundry Co., North Chicago, Illinois.

**CHF**



Illinois Eye and Ear Infirmary, University of Illinois, School of Medicine, Chicago, Illinois.
H. A. Lippner, Designer, PACE Associates.

On Readers' Service Card, Circle No. 340


Duraflake
KEITH:
SPEC
DURAFLAKE
ALL THE WAY!
Architect-wise, it's DURAFLAKE
. . . the engineered board
to assure smooth results.
Wise architects specify DURAFLAKE
DURAFLAKE is the core stock for fixtures and cabinets of every description. Workable and strong, it holds screws firmly on edge and face. In a wide variety of sizes and thicknesses. DURAFLAKE UNDERLAYMENT assures smooth surfaces for laying any floor covering. DURAFLAKE EXTERIOR SIDING helps insulate and deaden sound, easily exceeds commercial standard UM-32. Start specifying DURAFLAKE now!
Get more information about Duraflake today. Clip and mail to:
DURAFLAKE COMPANY
Box 428, Dept. PA
Albany, Oregon
Phone: 503/928-3341
TWX: 503/967-0608
Name
Firm
Title
Address
City
State
ZIP

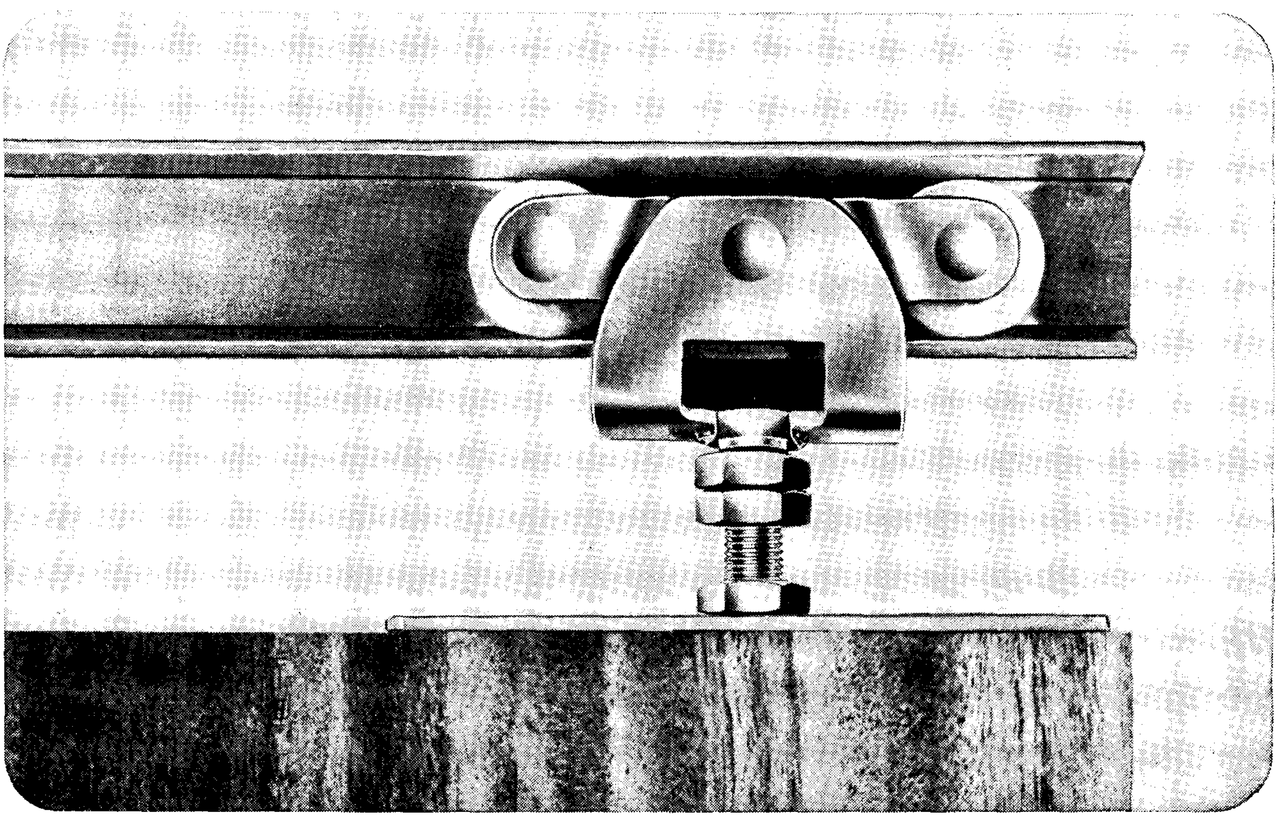
# 4 wheel drive

*Each Grant 7000 Sliding Door Hardware carrier has four wheels. Eight per door. Sixteen wheels supporting a pair of by-passing doors. Just one uncommon feature in a very unusual line of hardware.*

The 7000 line boasts innumerable other characteristics which help make it the most specified sliding door hardware. These include: *rocker arms insuring constant wheel-track contact, non-dust collecting tracks, balanced load distribution, nylon wheels, ball-socket suspension principle for misalignment compensation.*

More features are shown in the Grant catalog. It's yours for the asking.

**GRANT PULLEY & HARDWARE CORPORATION** / 49 High St., West Nyack, N.Y. / Los Angeles, Calif.

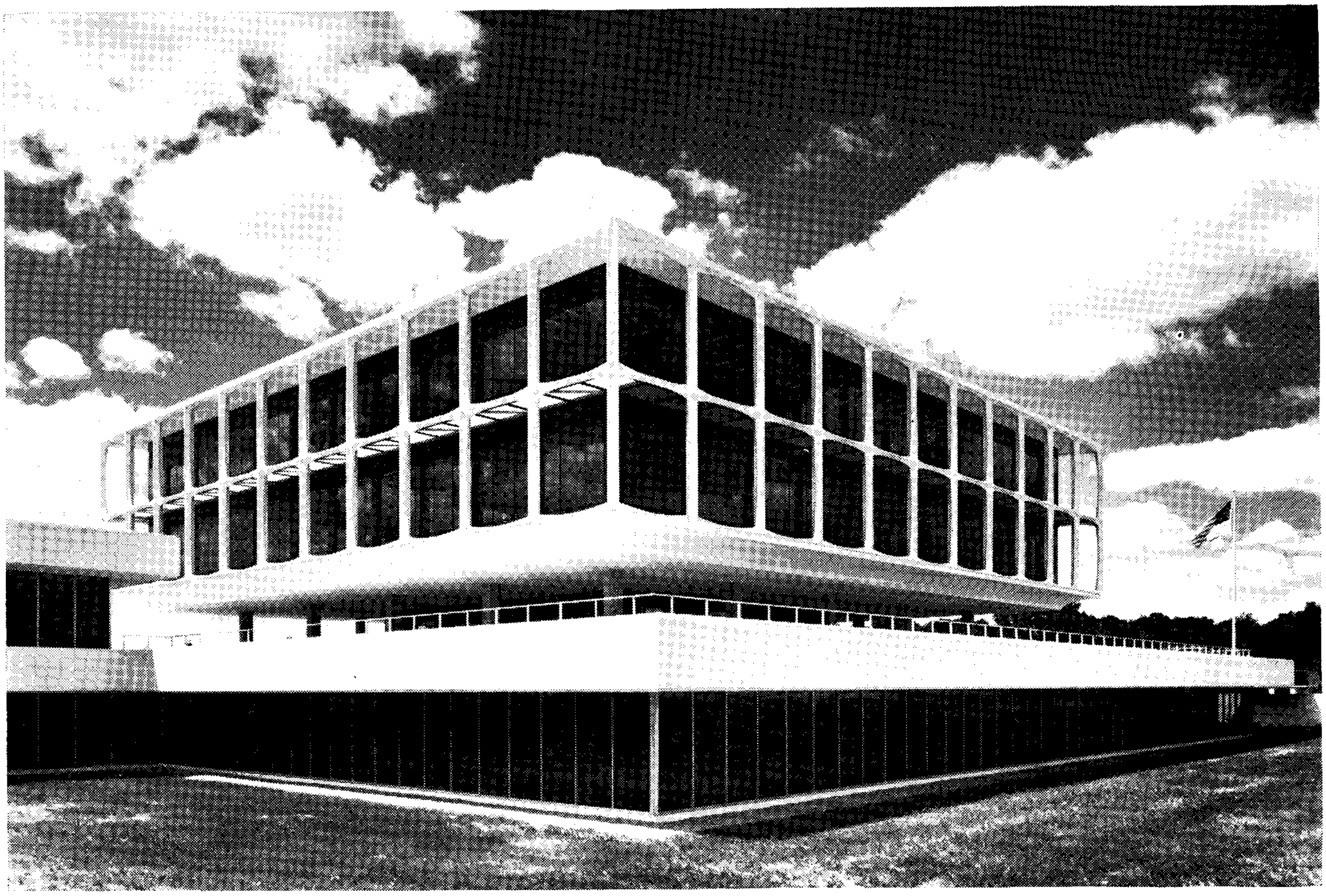




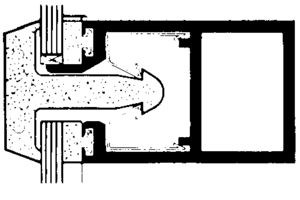
◄ On Readers' Service Card, Circle No. 352


The Petitt Chair
If you need an extra chair, try this one. An extra twenty of them go nicely around a conference table. An extra six do well in the dining room. An extra one or two take any small area of space and make it suitable for sitting. Don Petitt's new chair is made of a continuous curve of walnut that delights the eye from every angle. Knoll Associates, Inc., Furniture and Textiles, 320 Park Avenue, New York, New York 10022.
Knoll International operates in 26 countries.

# New PITTCO® T-WALL™ thermal framing system controls condensation, reduces heat loss in new Federal-Mogul Building



Federal-Mogul Corp. General Offices, Southfield, Mich. Architect: Giffels & Rossetti, Inc., Detroit.



The new PITTCO T-WALL has a proven 0.6* U-value. There is absolutely no metal connection from inside to outside. (See section.)

That means no condensation on the metal at room temperatures up to 70° with relative humidity of 35%—even when it's minus 20° outside. Metal framing is not chilly. Sound transmission is reduced.

Appearance is slim, elegant, unobtrusive. Face of the mullion is only 1½ inches wide; gasket projects only ⅜ of an inch from surface of the glass.

PITTCO T-WALL is available in several glazing thickness combinations, including double glazing for maximum insulation. Standard components will meet varying strength requirements.

For more information on this new PITTCO framing system, see Sweet's Architectural File, section 3a/Pi, or write for our 4-page descriptive folder. Pittsburgh Plate Glass Company, Pittco Architectural Metals Department, Ohio Street, Kokomo, Indiana 46901.

*Performance test data published March 1, 1965, by Pennsylvania State University.

PITTCO ARCHITECTURAL METALS

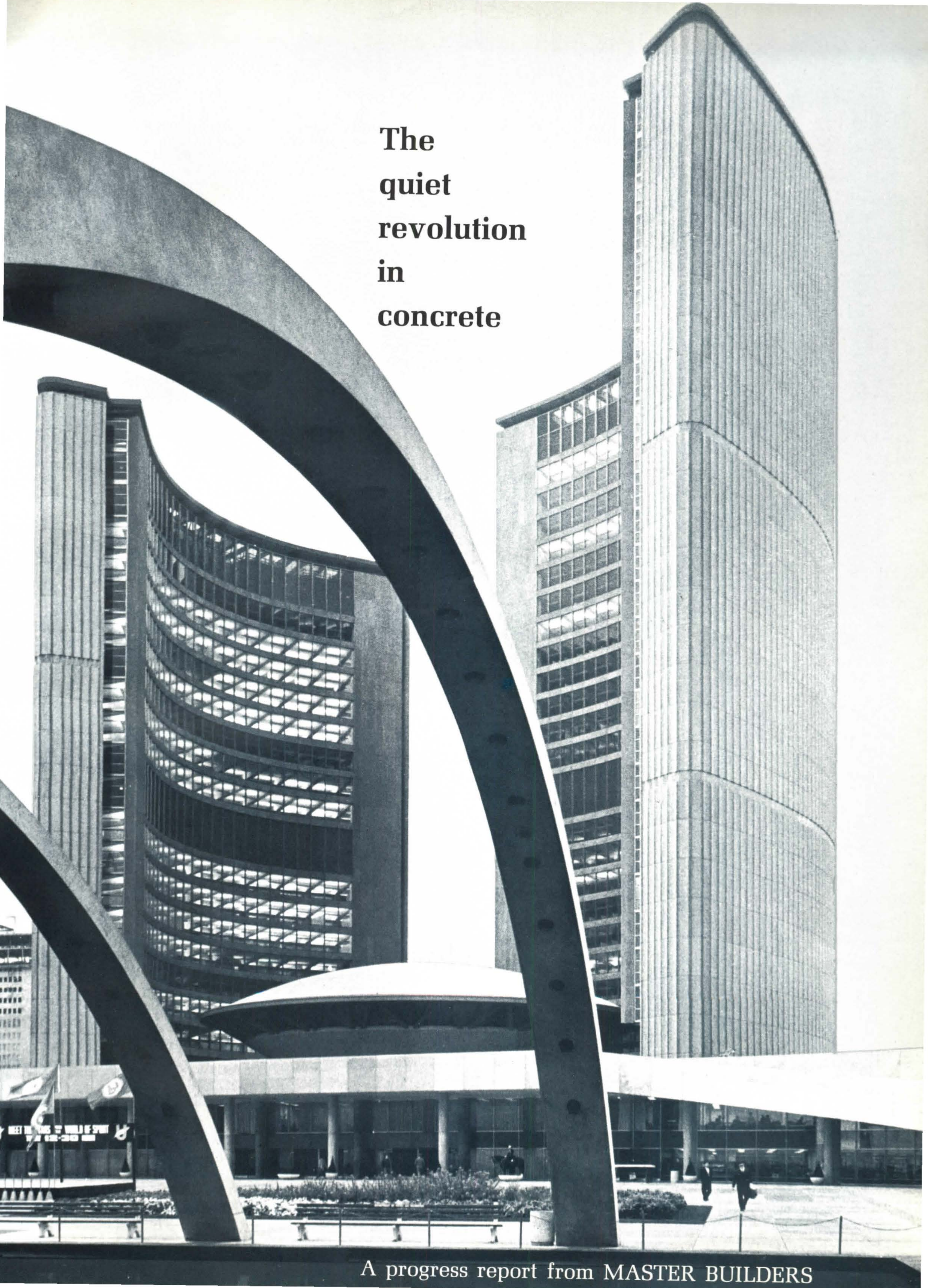


On Readers' Service Card, Circle No. 416



On Readers' Service Card, Circle No. 394 ➤

# The quiet revolution in concrete



A progress report from MASTER BUILDERS

# The quiet revolution in concrete

This year the world enters the final third of the 20th Century.

From this vantage point we can now see the second third of this century in perspective. Emerging clearly from the far-reaching changes of this era is the dramatic growth of concrete.

We have seen its growth as a major medium of expression. Growth in its capability. Growth in the realization of its potential. Growth in its use for myriad purposes. For this age-old material, evolution has become revolution.

Through the years designers recognized concrete's structural qualities but they frequently took great pains at great expense to keep it hidden from view.

It was not until the early '30's that a few pioneers, the innovators, in their search for new modes of expression, turned their eyes to concrete. Revolutionary design, exciting new shapes and daring structural commitments were achieved with concrete. The Quiet Revolution in Concrete was underway.

As more designers turned toward concrete as a means to achieve their design concepts, greater demands were placed on the material itself. Control of concrete resulted from advanced technical knowledge of architects, engineers, contractors, testing laboratories and ready mix producers, plus improved batching and mixing equipment.

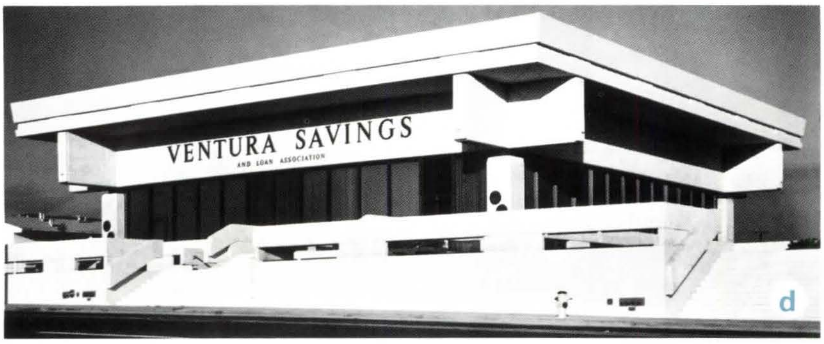
*continued . . .*

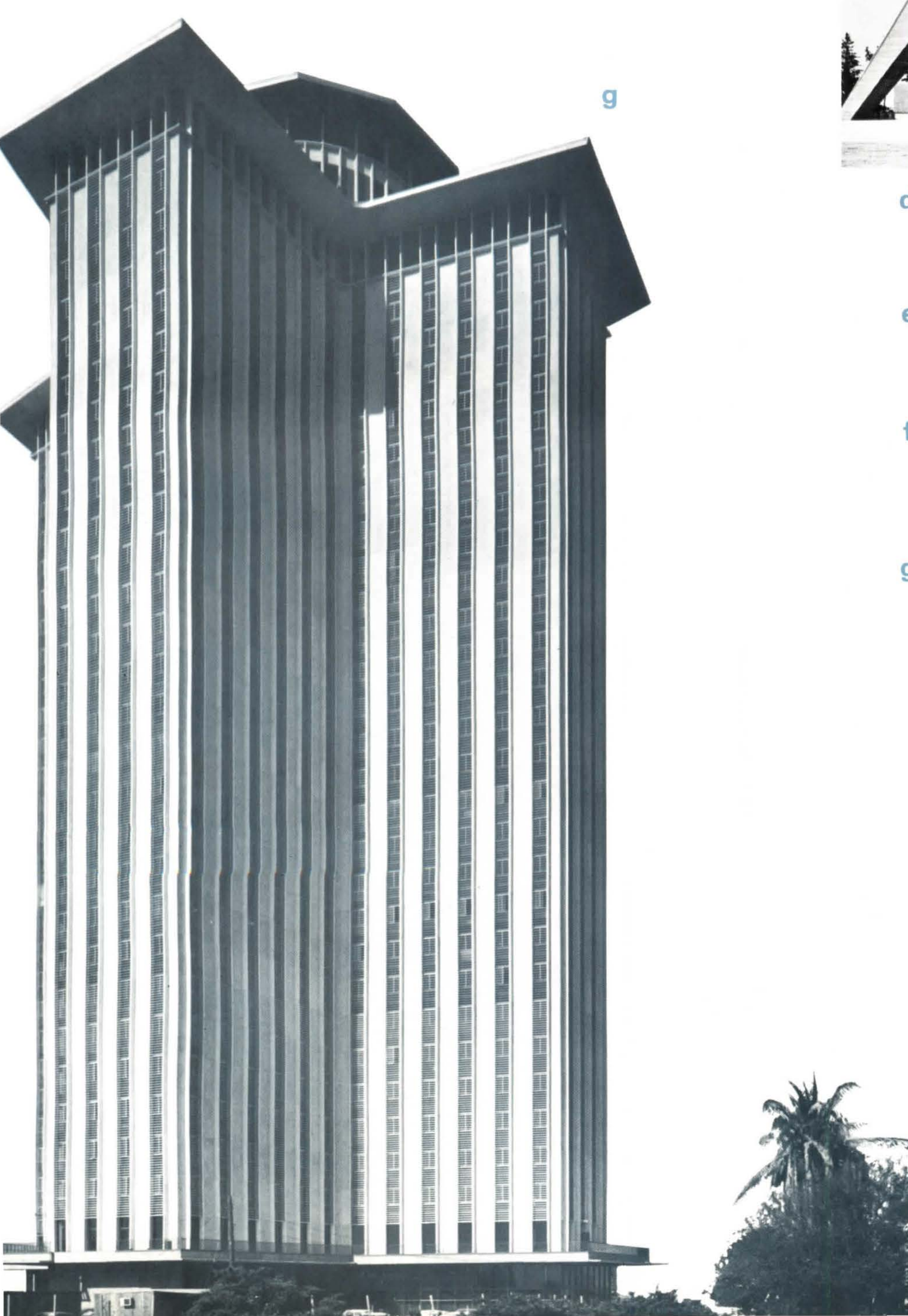
**a** Precast concrete piers with deeply curved reveals are featured in the exterior wall system of the new American Dental Association headquarters, Chicago, Illinois. Architect: Graham, Anderson, Probst & White. General Contractor: Turner Construction Co.

**b** Called the most important new building in North America, the Toronto City Hall features precast, textured elements along with smooth form and acid etched finishes. Architects and Engineers: Viljo Revell-John B. Parkin Associates. General Contractor: Anglin-Norcross Ontario Limited.

**c** The free-form design of Holy Family Church, Parma, Ohio, was sculptured in bush-hammered concrete. Architect: Conrad & Fleischman. Structural Engineer: R. M. Gensert Associates. General Contractor: The Martini Construction Company.

*Master Builders' POZZOLITH was used to improve concrete performance in all structures on these pages.*



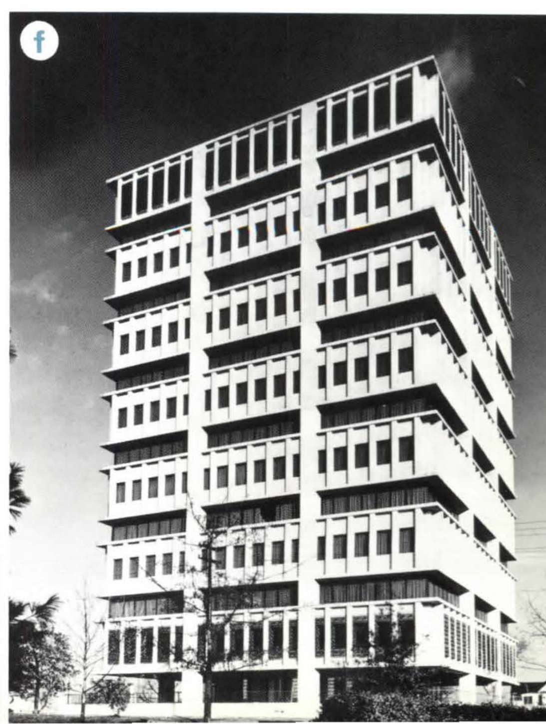



**d** The natural color and texture of the precast concrete components were carried to the interior of the Ventura Savings & Loan Association, Ventura, California. Architect: William Pereira. Structural Engineer: Woodward Tom Associates. General Contractor: William Simpson Company.

**e** Architectural concrete in form board texture is the design keynote of St. John's Abbey. Designer: Marcel Breuer. Project Architect: Hamilton Smith. Structural Engineer: Weisenfeld, Hayward & Leon. Structural Consultant: Pier Luigi Nervi. Contractor: McGough Construction Company.

**f** Both the central tower core and the precast Vierendeel trusses of the North Carolina Mutual Life Insurance Building, Durham, N. C., were constructed of Pozzolith concrete. Architect: Welton Becket and Associates. Consulting Engineer: Seelye, Stevenson, Value & Knecht. General Contractor: Rea Construction Company.

**g** Reinforced Pozzolith concrete is the key element in the 33-story, 407 ft. high Trade Mart Tower in New Orleans. Architect: Edward Durell Stone. Structural Engineer: Eller and Reaves. Contractor: Bloomfield Building Industries.



## The quiet revolution in concrete

A milestone in concrete performance was reached in 1932 when Master Builders introduced POZZOLITH, the first water-reducing admixture for concrete. It was an important key in controlling concrete's performance. POZZOLITH, improved quality and durability, but equally important, it introduced uniformity and repeatability.

This control provided a springboard from which designers could leap into a bold new world of innovation. Design concepts were suddenly enhanced by the exciting new-found capabilities of concrete.

With the greater versatility and reliability made possible through the use of POZZOLITH, concrete began to be the preferred construction material. As architectural ingenuity grew, so did the role of concrete. Daring new applications were born—

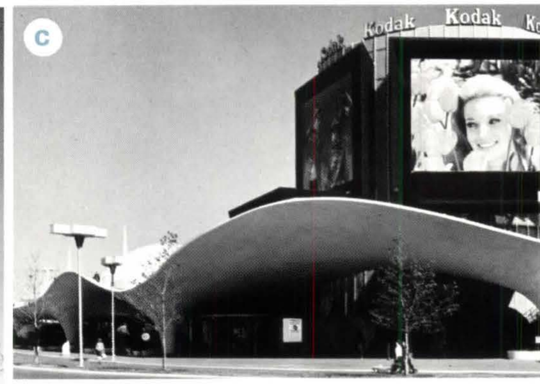
- lightweight structural
- thin-shell concrete
- exposed aggregate
- prestressing
- post-tensioning
- lift-slab, tilt-up slabs

And POZZOLITH rendered important contributions to all of these. It reduced unit water content without sacrificing workability or placeability. Or it increased workability without sacrificing strength, premeability and durability. It controlled setting time and improved appearance — increased watertightness and reduced cracking.

In short, POZZOLITH made concrete more useful and more versatile — more durable and more dependable. It made good concrete better and made concrete acceptable for many applications where heretofore plain concrete may have been questioned.

*continued . . .*







**a** Clean, sharp lines of architectural concrete mark the new American Institute for Research, Pittsburgh, Pa. Architect: Tasso Katselas. Structural Engineer: R. M. Gensert Associates. General Contractor: Navarro Corp.

**b** Reinforced concrete reaches a new high in luxury apartments at the 645 ft. tall 1000 Lake Shore Drive Plaza, Chicago, Ill. Architect: Sidney H. Morris & Associates. Structural Engineer: William Schmidt & Associates. General Contractor: Morris Handler Co., Inc.

**c** The undulating free-form roof of the Eastman Kodak Pavilion at the World's Fair required controlled setting time and exceptional uniformity. Designer: Will Burtin. Architect: Kahn & Jacobs. Engineer: Lev Zetlin & Associates. General Contractor: George A. Fuller Co.

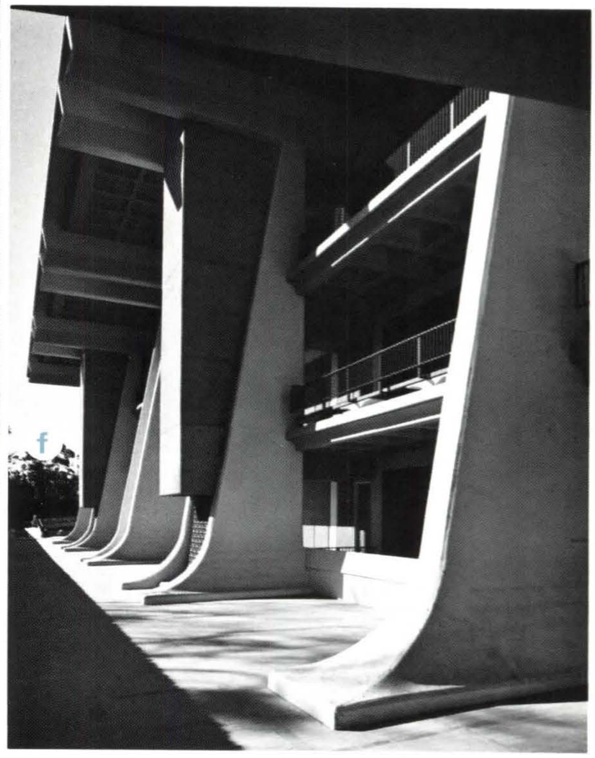
**d** Precast structural crosses produce striking architectural design for the John Hancock Mutual Life Insurance Building in Kansas City, Mo. Architect: Skidmore, Owings and Merrill. Structural Engineer: Paul Weidlinger, and Weiskopf and Pickworth. Contractor: W. E. Brown Associates.

**e** POZZOLITH concrete provides structural durability and lasting beauty at the Marriott Motor Hotel in Atlanta, Ga. Architect: James M. Hunt. Contractor: Beers Construction Co.

**f** Bold use of exposed concrete is exemplified in the Library Building on the San Diego campus of the University of California. Architect: Deems, Lewis, Martin & Assoc. Structural Engineer: A. J. Blaylock & Assoc. General Contractor: J. B. Allen Company.

**g** Spectacular shapes achieved with concrete identify the Park Towers apartments in Toronto. Architect: John H. Daniels. Engineer: Reicher, Bradstock & Associates Ltd. Contractor: Cadillac Development Corporation Ltd. and Globe Building Co. (Toronto) Ltd.

e


f


g

## The quiet revolution in concrete

Today, controlled performance concrete is the one building material that permits total architectural freedom — expression without restraint.

Designers are taking advantage of this new freedom. Structural boldness and textural expression in concrete have become the rule rather than the exception. Concrete is serving in many ways never thought possible. Radical practices have developed the aesthetic properties of concrete. Exposed aggregate surfaces, bush hammered, acid etched and form-board finishes provide natural beauty to last through the ages.

The Quiet Revolution in Concrete has grown from a murmur to a strong voice. It is heard throughout the world. More and more noteworthy structures stand as monuments to the versatility of concrete and POZZOLITH plays a vital role in the majority of them. It was the first admixture to achieve predictable control of concrete. Imitators have come upon the scene, but not one has managed to surpass the repeatability of performance that is POZZOLITH's.

As architects design for the world of the future, they will continue to create new and exciting uses for concrete. As POZZOLITH has grown with concrete, so will it continue to meet the everchanging architectural challenges of the changing world. Concrete is better today, and so is POZZOLITH. So they will be tomorrow.

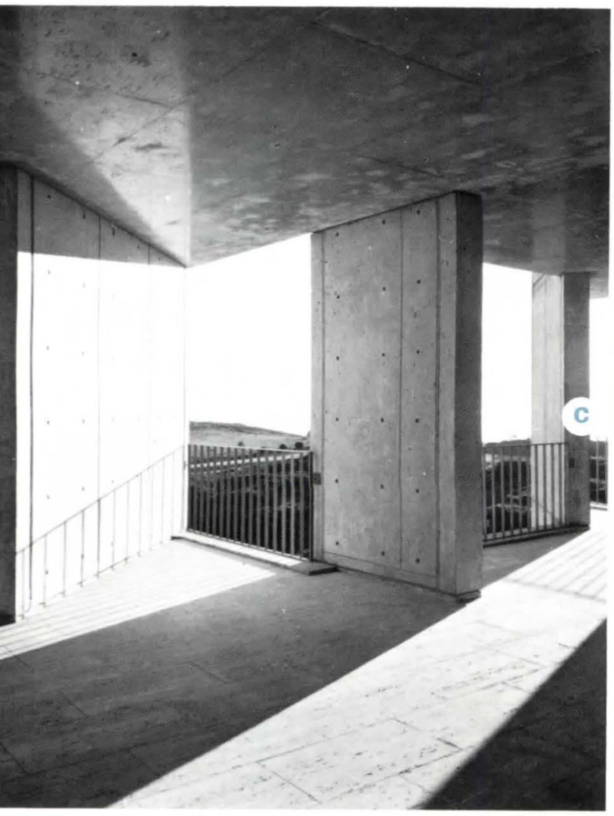
The Quiet Revolution in Concrete may yet become a tumultous roar.

**a** A huge prestressed monolithic concrete girder system supports the roof and hung balcony and frees the interior of columns at the Munson-Williams-Proctor Institute Art Gallery, Utica, N. Y. Architect: Phillip Johnson. Engineer: Lev Zetlin & Associates. General Contractor: George A. Fuller Co.

**b** Chatham Tower apartments in New York City add twin concrete towers to the changing skyline of lower Manhattan. Architect: Kelly & Gruzen. Structural Engineer: Weinberger, Frieman, Leichtman & Quinn. General Contractor: Joseph P. Blitz.

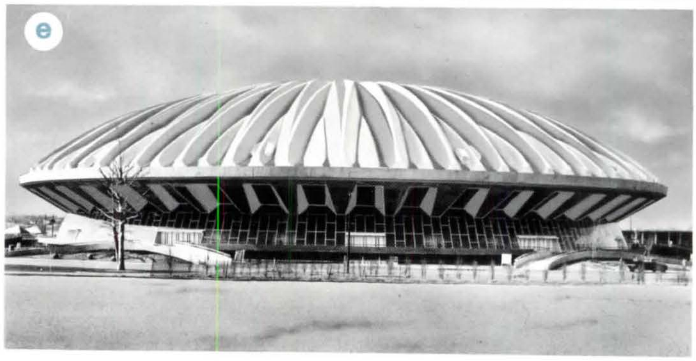
**c** The raw beauty of exposed concrete sets the environmental tone of the Salk Institute for Biological Studies at La Jolla, Cal. Architect: Louis I. Kahn. Structural Consultant: August E. Komendant. General Contractor: George A. Fuller Co.

c



d

e



**d** Strength and security are visibly expressed in the Public Safety Building, Winnipeg, Manitoba. Architect: Libling Michener and Associates. General Contractor: Peter Leitch Construction Company Ltd.

**e** Low slump, lightweight concrete was placed on the 45° slopes of the 400-ft. diameter dome of the University of Illinois Assembly Hall. Architect: Harrison and Abramovitz. Structural Engineer: Ammann & Whitney. General Contractor: Felmley-Dickerson Co.

**f** Brush-hammered and form board finishes were used throughout Endo Laboratories, Garden City, N. Y. Architect: Paul Rudolph. Engineer: Henry Pfisterer. General Contractor: Walter Kidde Construction, Inc.

f

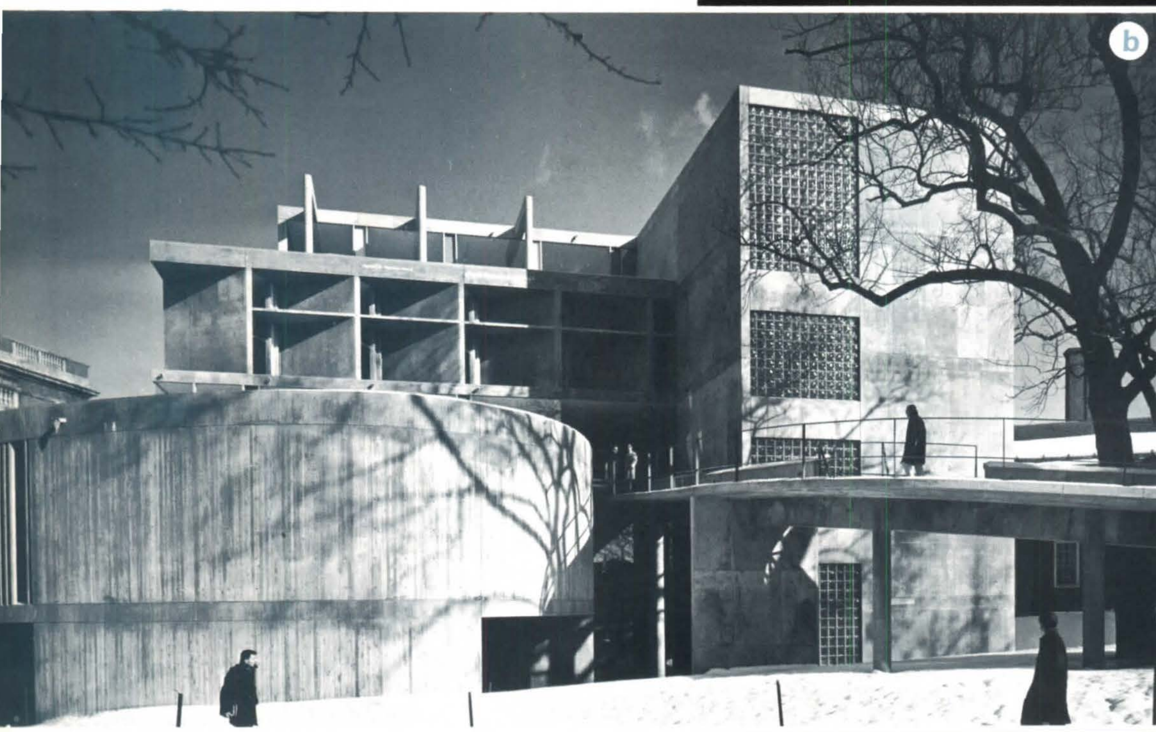
**a** Memphis Airport Terminal, Memphis Tenn., illustrates the control of plastic and hardened concrete properties needed in thin shell construction. Architect: Mann and Harrover. Engineer: S. S. Kenworthy and Associates. Contractor J. A. Jones Construction Co.

**b** Blunt honesty through the use of exposed concrete identifies the Carpenter Visual Arts Center at Harvard University. Architect: Le Corbusier. Collaborating Architects: Sert, Jackson & Gourley. Structural Engineer: William J. Le Messurier & Assoc., Inc. General Contractor: George A. Fuller Co.

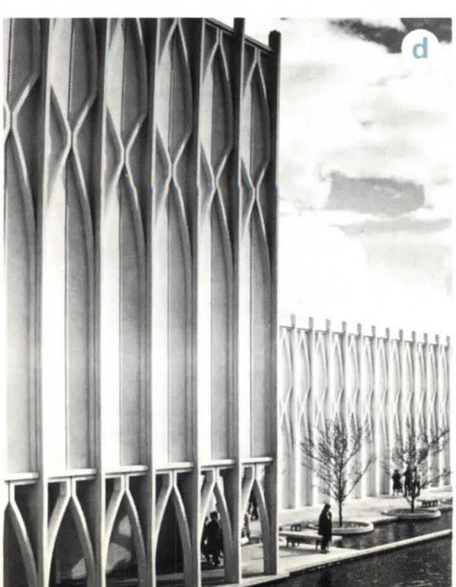
**c** The National Offices of the American Baptist Convention, Valley Forge, Pa., represents a panorama of modern concrete applications. Architect: Vincent G. Kling. Structural Engineer: McCormack-Taylor Associates. General Contractor: Turner Construction Co.

**d** The Pacific Science Center in Seattle stands as a monument to precast, exposed aggregate concrete. Architect: Minoru Yamasaki & Associates, Naramore, Bain, Brady & Johanson. Engineers: Worthington, Skilling, Helle & Jackson. Contractor: Purvis Construction Company.

**e** Sculptured concrete gives a feeling of flight to the TWA Terminal at Kennedy International Airport. Architect: Eero Saarinen & Associates. Consulting Engineer: Ammann & Whitney. General Contractor: Grove, Shepherd, Wilson & Kruge, Inc.



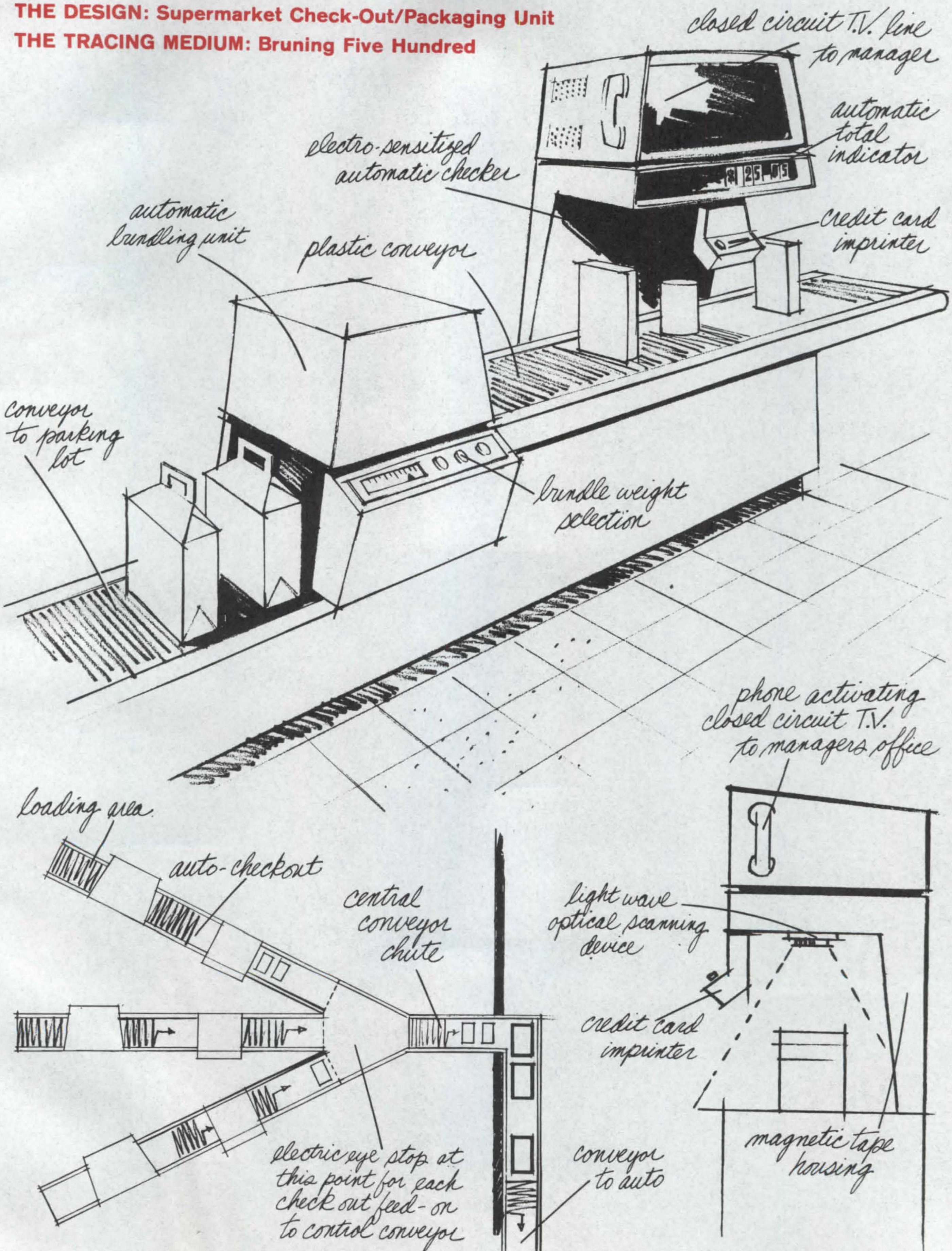



**DESIGNERS 1985**

**THE DESIGNER: Lester Beall Inc.**

**THE DESIGN: Supermarket Check-Out/Packaging Unit**

**THE TRACING MEDIUM: Bruning Five Hundred**



# KINNEAR

## The name that has been synonymous with Top Performance and Lifetime Service in ROLLING DOORS *for over 70 years*

When you want to be sure of the best possible door performance, backed up with reliable lifetime service, make certain that the door you select bears the Kinnear "Registered" name plate. It insures you of having the exclusive, time-proven design of the originator — and the leading manufacturer — of the interlocking slat-type of rolling door.

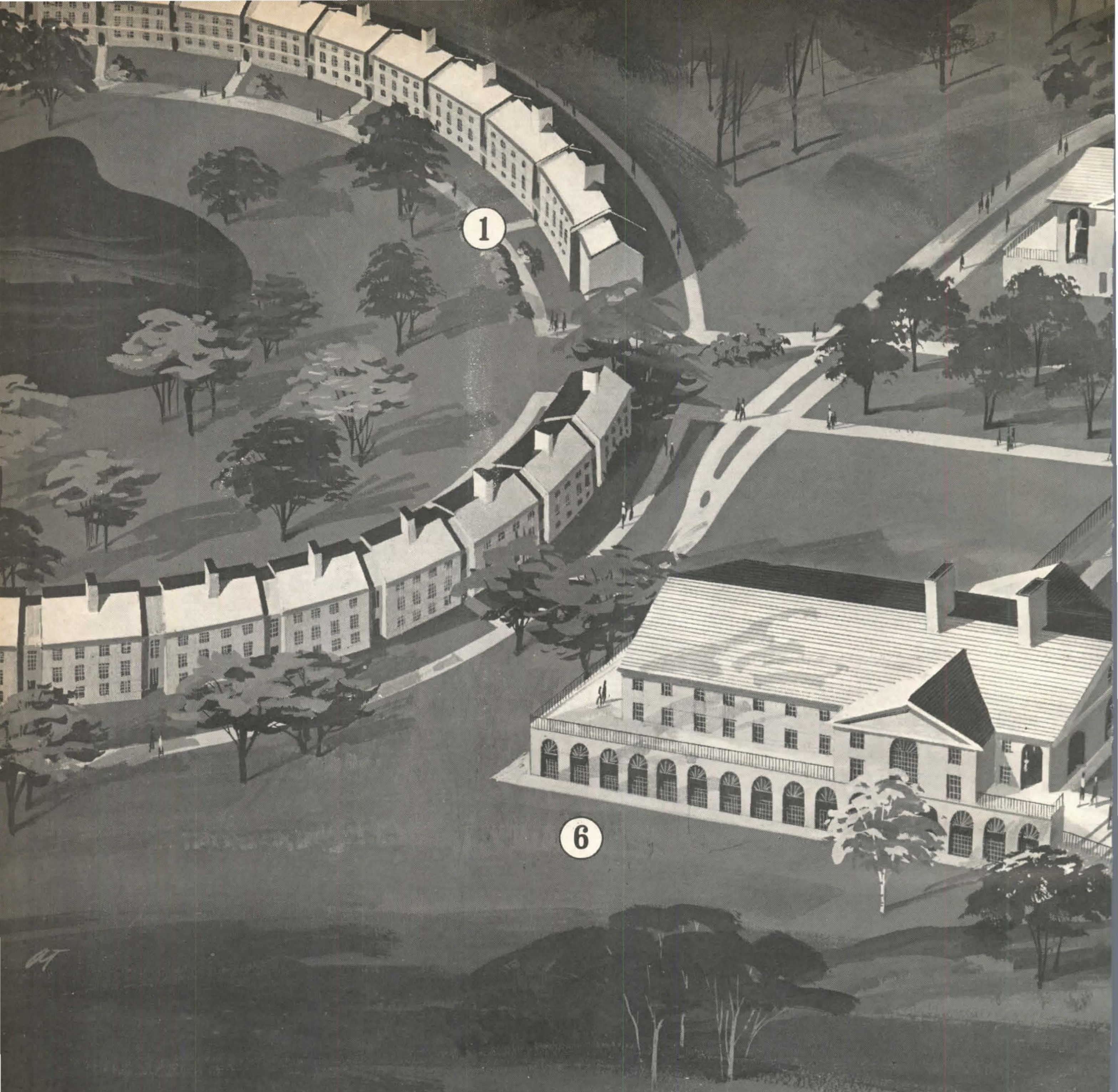
But that's not all! Every door bearing the Kinnear label is "Registered" and identified by its own registration number permanently stamped in the name plate* mounted on the bottom of the door. Complete engineering details on the door of that number are permanently kept in fireproof vaults so that genuine Kinnear replacement parts are available even for doors installed 70 years ago, in case of accidental damage or other mishap. Truly, "life extension" insurance! And it's made still more valuable by Kinnear's nation-wide service organization of trained and experienced door specialists who are always on-call to keep your doors shipshape.

Couple this door service and performance with the operating efficiency and space economy of the rolling door design and it's easily understood why Kinnear Rolling Doors have been so universally preferred for so many years. Specify **Kinnear** for your door needs.

**Also manufacturers of Power Operators, Automatic Rolling Fire Doors and Shutters, Rolling Grilles, Rolling Counter Shutters and RoL-TOP (overhead type) Wood or Metal Doors.**

**The KINNEAR Manufacturing Co. and Subsidiaries**
1909-20 Fields Avenue, Columbus, Ohio 43216
**FACTORIES:** Columbus, Ohio 43216 • San Francisco, Calif. 94124 • Toronto, Ont., Canada
Offices & Representatives in All Principal Cities—listed in Yellow Pages under "Doors." Also see Sweet's!

*For even your further protection the door "Registration" number is also stamped under the hood, on the end of the barrel shaft and on the motor operator plate.




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

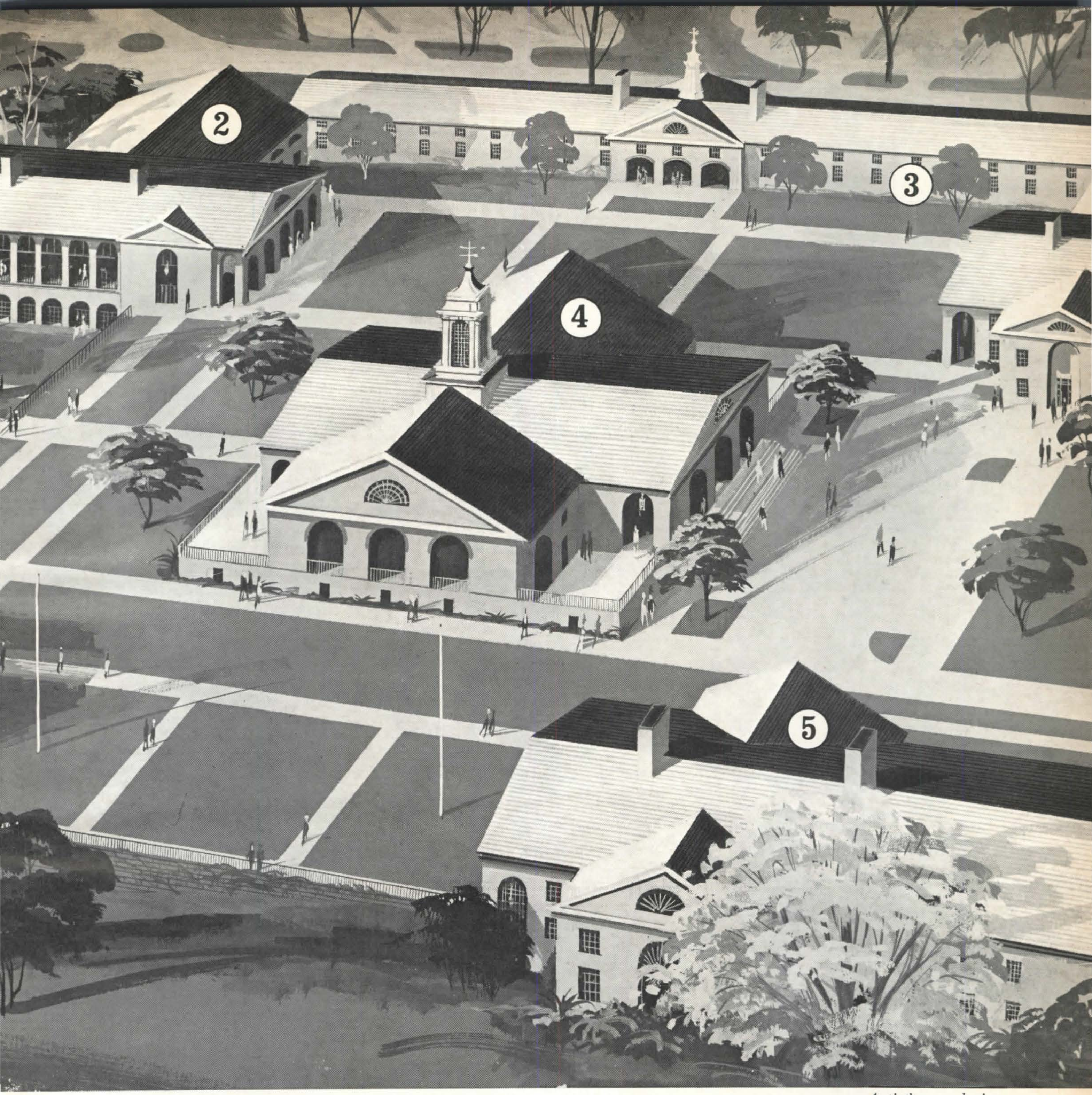
When the Board of Trustees of Bentley College, a professional college of accounting and finance, started planning their new $25-million, 102-acre campus in Waltham, Massachusetts, this was their goal:

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

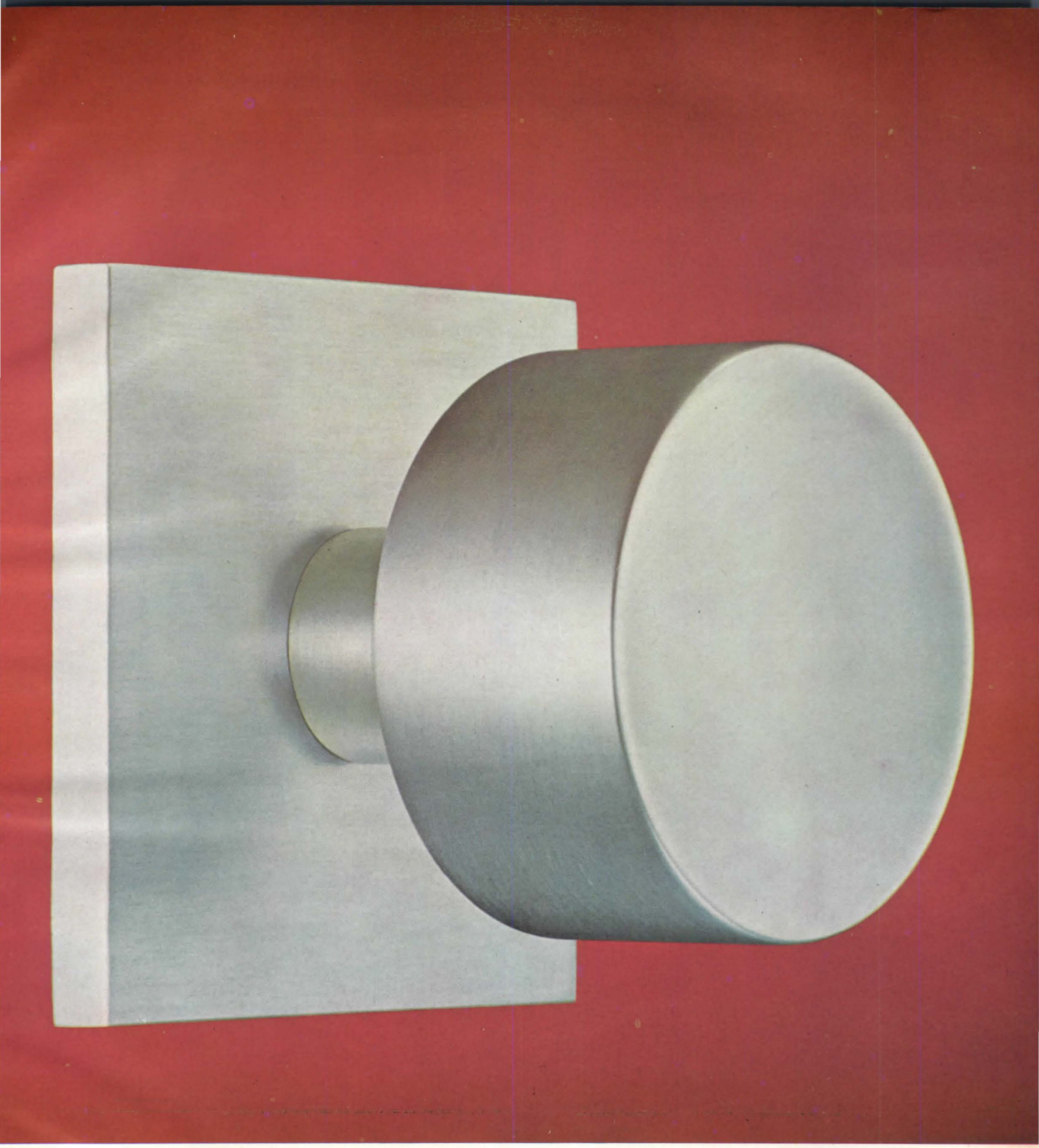
Comparison studies with other methods convinced them that an all-electric campus, employing flameless electric heating and cooling, would best meet their requirements.

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

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



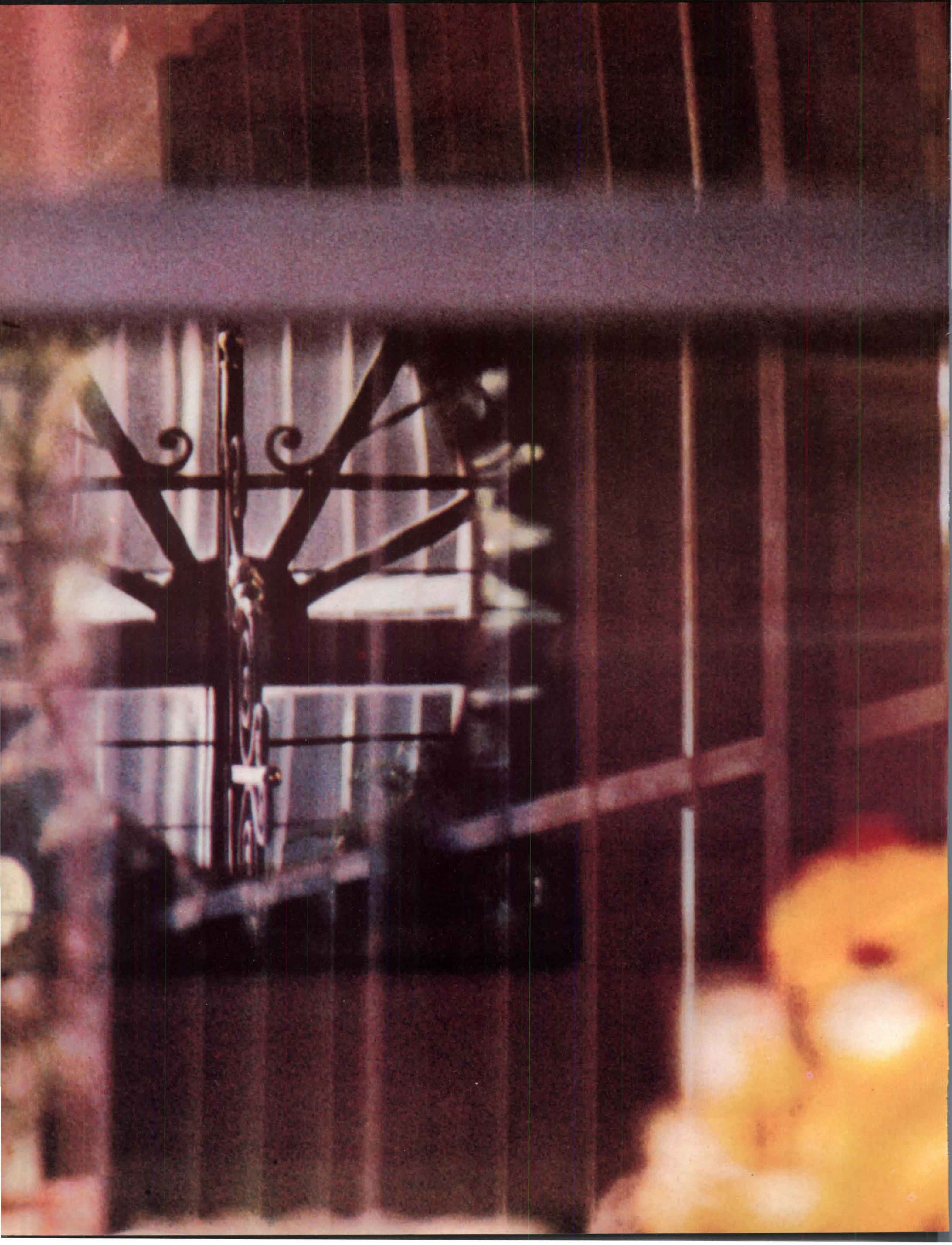

*Artist's rendering*





On Readers' Service Card, Circle No. 384 ▶

*To reflect upon the familiar and breathe into it fresh ideas of color, of texture, even of form — this is the idea of KALCOLOR® aluminum. At Kaiser Aluminum, the idea is ideas.*



# speaking of study carrels...

Myrtle Desk study carrels speak a language all their own. Versatility. Quality craftsmanship. Sheer prestige and beauty. And Myrtle Desk study carrels adapt to flexible arrangements that provide additional space for individual study without subtracting space from your total floor plan. Artistic design and masterful engineering details go into every coordinated piece of Myrtle Desk library furniture crafted so beautifully in contemporary walnut, traditional maple or custom combinations of exotic woods and metal. Myrtle Desk library furniture is first choice in all 50 states. To see why, write for an illustrated catalog of the entire coordinated collection of Library furniture: Dept. PA106, High Point, N. C. 27261.

**MYRTLE DESK!**
**LIBRARY DIVISION**

Dome Design: Welton Becket and Associates, architects and engineers, Los Angeles, New York, San Francisco, Houston

Architects and Engineers: Victor Gruen Associates, Los Angeles, Washington, New York and Alexander Ewing & Associates, Philadelphia

# Renaissance of yesteryear's daylighted arcades ...with PLEXIGLAS®

At Strawbridge & Clothier's ultra-modern store in Plymouth Meeting, Pa., and at many other new stores and shopping malls, the grandeur of soaring Old World daylighted arcades is being recreated in contemporary designs. PLEXIGLAS acrylic plastic, with its structural advantages and great design flexibility, is the key material in this 20th Century adaptation of a practical 19th Century architectural concept.

Because PLEXIGLAS is light in weight and can be formed into shapes having great rigidity and load-bearing capacity, daylight openings can be large, with a minimum of supporting structure. In addition to its proved weatherability, PLEXIGLAS is highly resistant to breakage. It is available in a broad range of transparent tints and translucent colors that provide control of solar glare, heat and light transmittance.

Excellent examples of roof designs, and installation details, are given in our brochures "Domes and Arches of PLEXIGLAS" and "PLEXIGLAS in Architecture". Write for them, information on building code regulations, and the names of qualified contractors who are experienced in working with this rewarding material.

ROHM AND HAAS
PHILADELPHIA, PENNSYLVANIA 19105

*PLEXIGLAS is a registered trademark of Rohm and Haas Company for its brand of acrylic plastic sheets.*

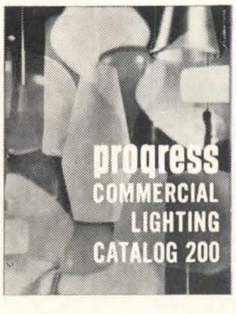
# Progress lighting meets or exceeds your specifications... at sensible prices.

# Why not save time and trouble by making them your first choice?

# Sooner or later you'll find you can't do better.

# That's progress!

If the specs say "Progress or equal," you can stop right there! No one equals Progress quality at Progress prices. And the wide range of fixtures can be appreciated only by someone who knows the Progress residential catalog. In its Commercial Lighting Catalog 200, Progress selects just the fixtures you need for your commercial work, and shows them in full color, with exact dimensions and convenient rapid estimate illumination charts.




Let us send you more information on this Progress line, and a copy of the catalog. It may shed an entirely new light on the meaning of "or equal."

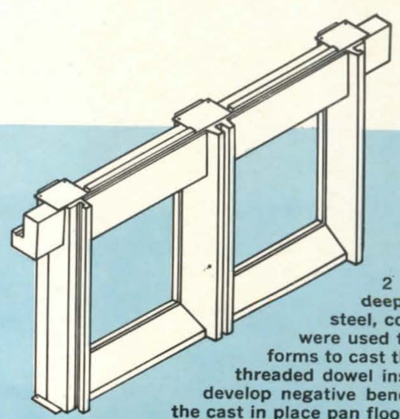
**Dept. DC, PROGRESS MANUFACTURING CO., INC., Box 7798, Phila., Penna. 19104**


NEW CREATIVITY
IN ARCHITECTURAL
CONCRETE

**Huntington Trust Building,** Columbus, Ohio. Associated Architects: Skidmore, Owings & Merrill, New York, N. Y. and Benham, Richards and Armstrong, Columbus, Ohio. Gen. Contractor: Frank Messer & Sons, Cincinnati, Ohio. Structural Engineers: Weiskopf & Pickworth, New York, N. Y. Precast Units: by the Marietta Concrete Company, Marietta, Ohio.

# The tallest to date . . . 12 stories of precast load bearing panels made with MEDUSA WHITE

17 ton precast load-bearing units for the tallest structure of its type are made of Medusa White . . . the original white Portland Cement . . . used for developing a tinted matrix with silica gravel and sand blasted for architectural exposure. Because of Medusa whiteness, the material is ideally suited for this use. Ask your precast producer about Medusa White . . . or write us direct.



Typical load-bearing precast unit is 12 feet high x 23 feet, 8 inches wide and 2 feet 7¾ inches deep. Combinations of steel, concrete and plastic were used to construct 12-ton forms to cast the units. 1'-3", #5, threaded dowel inserts were used to develop negative bending moment with the cast in place pan floor system. All joints sealed with Neoprene gaskets. 22 different shaped units were incorporated requiring 6000 psi concrete in 28 days.

**MEDUSA PORTLAND CEMENT COMPANY**
**P. O. Box 5668, Cleveland, Ohio 44101**

WHITE AND GRAY PORTLAND CEMENTS • WHITE, GRAY AND CUSTOM COLOR MASONRY CEMENTS • ChemComp SHRINKAGE-COMPENSATING CEMENT



On Readers' Service Card, Circle No. 398

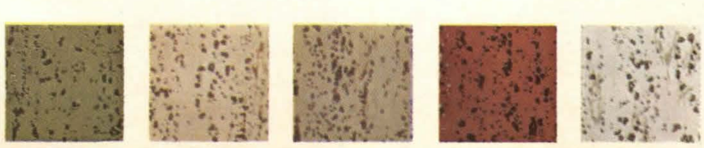
Natural Cream & Avocado. Photographed at the Lafayette Motor Hotel, Norfolk, Va. Architect: Wm. Bursnall; Flooring Contractor: Ferrell Linoleum & Tile Company, both of Norfolk.

*For a dramatic entrance...*

# TRAVERTINE Vinyl Asbestos Floor Tile by RUBEROID

A Ruberoid Original. Has the rich texture of Italian marble. Subtle, natural shadings. A rugged wearing floor tile that adds distinction to almost any architectural concept. Ask your Ruberoid flooring representative for samples or write to Ruberoid at the address below.

Available in 5 colors in 12" x 12" tiles, ⅛" and 3/32" gauge.



ET-205 Avocado | ET-203 Natural Cream | ET-204 Clay Buff | ET-206 Clay Red | ET-201 Ivory

RUBEROID®
FINE FLOORING
The RUBEROID Co.
733 Third Ave., New York, N. Y. 10017

On Readers' Service Card, Circle No. 424

# Home Office of CITY NATIONAL BANK in Columbus Center, Columbus, Ohio

Columbus Center is a contemporary 25-story building with a total floor space of 10 acres. Stretching 350 feet above the ground, Columbus Center is the second tallest building in the city.

Harrison & Abramovitz
Architects

Jaros, Baum & Bolles
Mechanical Engineers

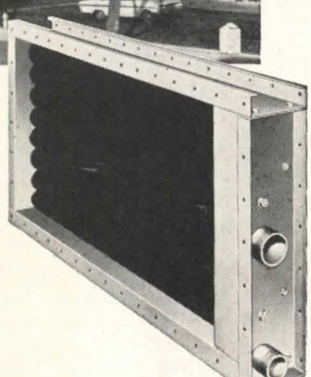
Turner Construction Co.
General Contractor

The Huffman-Wolfe Co.
Mechanical Contractor

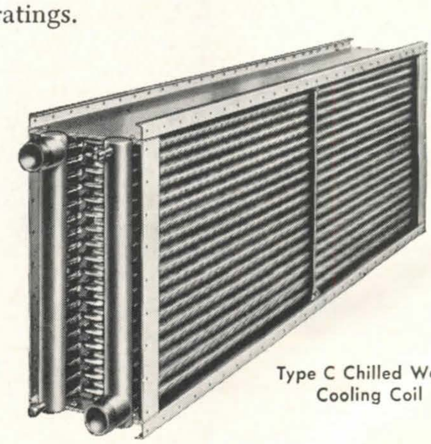
# AEROFIN
## Heat Transfer Coils
# INSTALLED

Modern smooth-fin design of Aerofin coils permits ample heat-exchange capacity in limited space — permits the use of high air velocities without turbulence or excessive resistance.

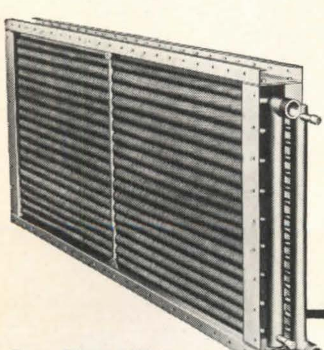
Aerofin performance data are laboratory and field proved. You can safely specify Aerofin coils at full published ratings.



Type A Non-Freeze
Steam Heating Coil



Type C Chilled Water
Cooling Coil



Type CH Hot Water
Reheat Coil

## AEROFIN CORPORATION

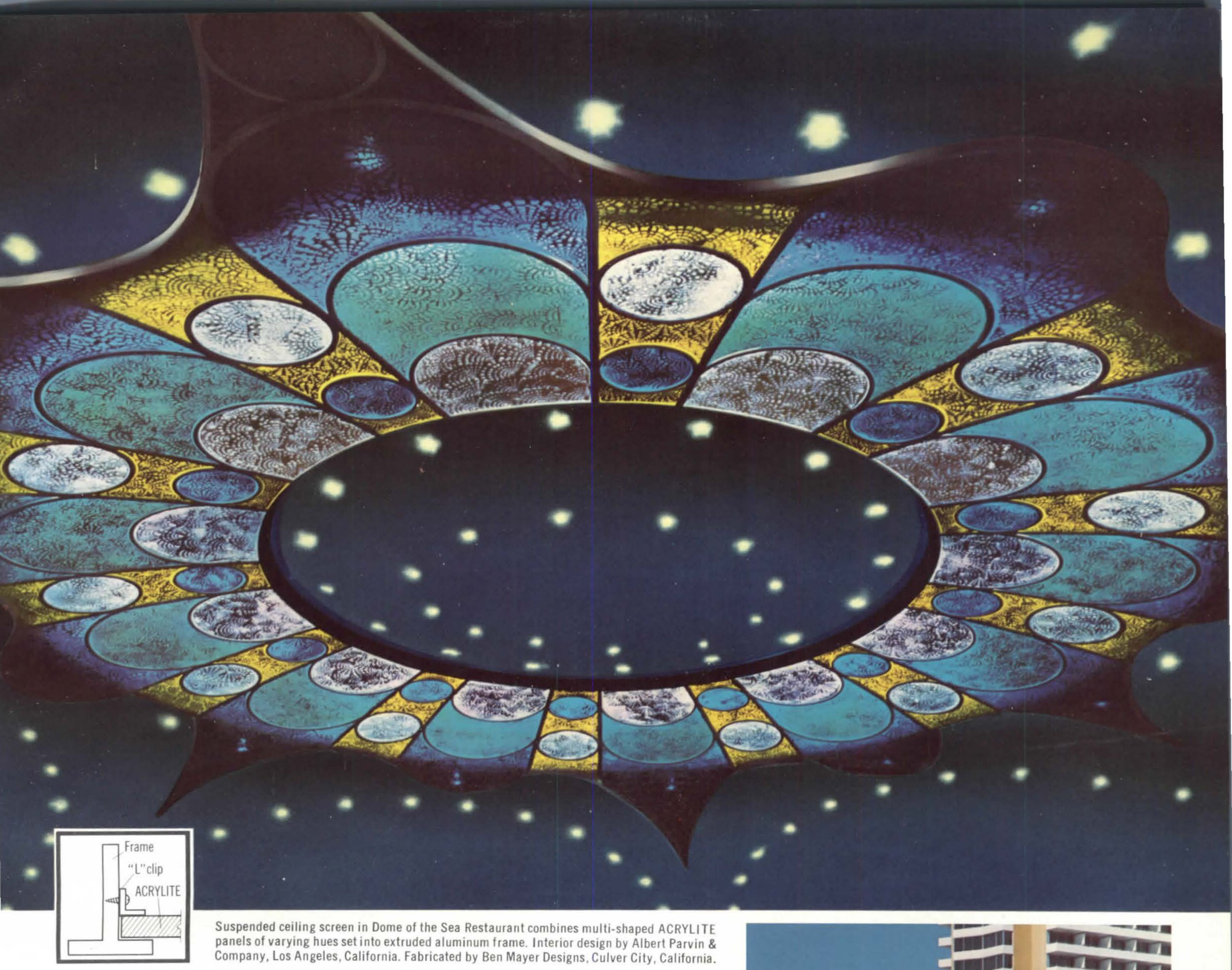
**Lynchburg, Virginia 24505**

*Aerofin is sold only by manufacturers of fan system apparatus. List on request.*

ENGINEERING OFFICES IN PRINCIPAL CITIES



On Readers' Service Card, Circle No. 325




Suspended ceiling screen in Dome of the Sea Restaurant combines multi-shaped ACRYLITE panels of varying hues set into extruded aluminum frame. Interior design by Albert Parvin & Company, Los Angeles, California. Fabricated by Ben Mayer Designs, Culver City, California.

# WANT AN UNDERSEA FEELING? ...TRY AN **ACRYLITE**® CEILING

That's what the Dome of the Sea Restaurant at the Dunes Hotel in Las Vegas did with this shell motif ceiling unit. Scrolled ACRYLITE® Acrylic Sheets in blue, yellow, aquamarine and white flow together to suggest an illusion of underwater mystery, and are back lighted to provide evenly diffused illumination for relaxed dining. This is only one of the imaginative ways ACRYLITE is being used in hotels, restaurants, lounges, motels, commercial and residential interiors. Its beauty lasts a lifetime . . . won't fade or discolor with age.

ACRYLITE is shatter-resistant, lightweight, weatherproof, easily cut, formed and fabricated. It is classified as a slow burning plastic by Underwriters Laboratories, Inc. It comes in over 70 patterns and colors; smooth or textured surfaces; transparent, translucent or opaque; standard sheet sizes and thicknesses. For more information, refer to Sweet's Architectural File 7d/Am. See for yourself how ACRYLITE can add excitement to interiors.

ACRYLITE®
ACRYLIC SHEET

***FOR FREE SET OF ACRYLITE SAMPLES, MAIL COUPON TODAY***

**American Cyanamid Company, Building Products Division • 595 North Ave., Wakefield, Mass. 01881**

I am interested in learning more about ACRYLITE. Please send me a free set of samples.

CP

Name__________ Title__________

Company__________

Street__________

City__________ State__________ Zip Code__________

AMERICAN CYANAMID COMPANY • BUILDING PRODUCTS DIVISION CYANAMID

# HARDWICK'S
## *duralok carpet with 100% Acrilan® acrylic pile*

## *. . . the right answer to school floor covering questions*

DURALOK has all the answers for contract carpet installations. Passes the heavy traffic test in schools and public buildings. Moth proofed DURALOK retains its colorful beauty through repeated cleaning. This proven classroom asset lessens noise . . . reduces the need for other acoustical installations. And Hardwick—the compact carpet mill—is a graduate from the school of service. Majoring in personal attention . . . a better edge on price . . . custom carpeting . . . fast delivery . . . and performance plus carpeting you can count on for all your contract installations.

Write today for your free DURALOK Selector and informative reprints and brochure on the merits of Acrilan® acrylic carpet fiber.

**HARDWICK & MAGEE CO.**
Lehigh Ave. at 7th St., Phila., Pa. 19133

Please send me, at no cost or obligation, your Duralok Selector and Acrilan reprints and brochure.

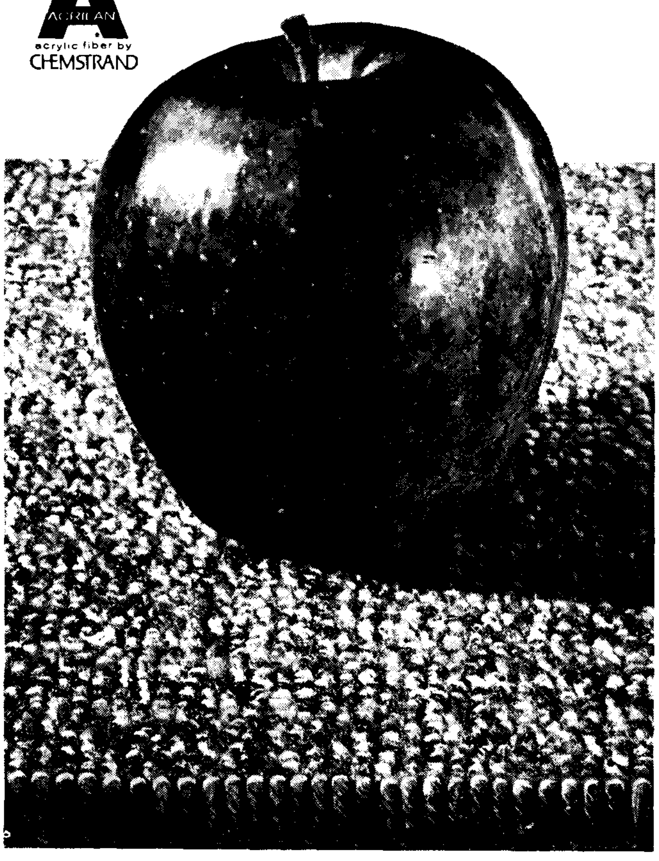
**Name** ______________________

**Firm Name** ______________________

**Street** ______________________

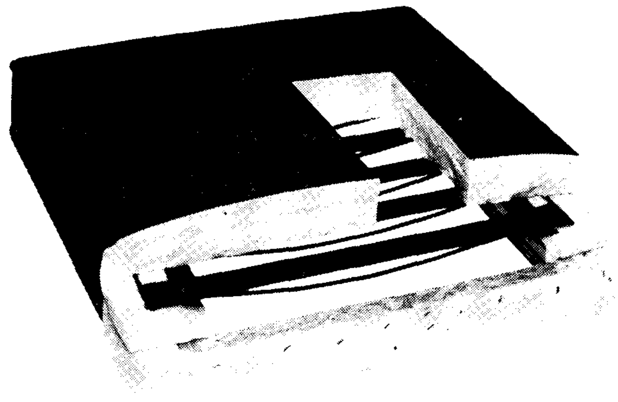
**City** ____________ **State** ______ **Zip Code** ______

ACRILAN
acrylic fiber by
CHEMSTRAND



**HARDWICK & MAGEE CO.,** Lehigh Ave. at 7th St., Phila., Pa. 19133
Chicago • Dallas • Detroit • New York • San Francisco • Los Angeles

On Readers' Service Card, Circle No. 469

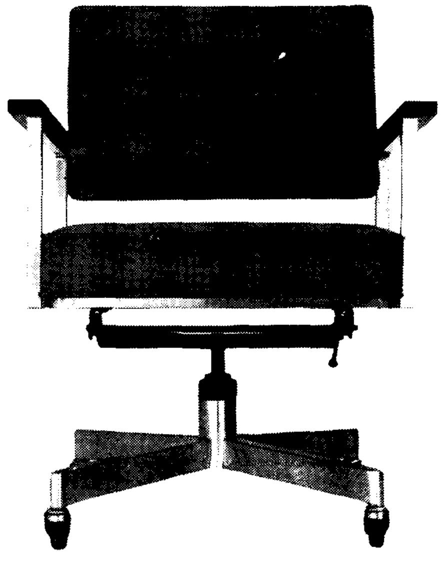


## Only chairs in their class with spring suspension on seats

In chairs, it's what's inside that counts. And the spring suspension in Sturgis chairs counts *big!* Most chairs use foam only. Now Sturgis 700 Series is first with springs inside the foam. This added resilience means maximum comfort with minimum wear.

Special *flat* spring construction provides the comfort, but holds the contemporary square design that is so popular.

There's never been a chair like this at a price like this. If you'd like us to spring with the complete story, write to Department PA-105, The Sturgis Company, Sturgis, Michigan 49091.

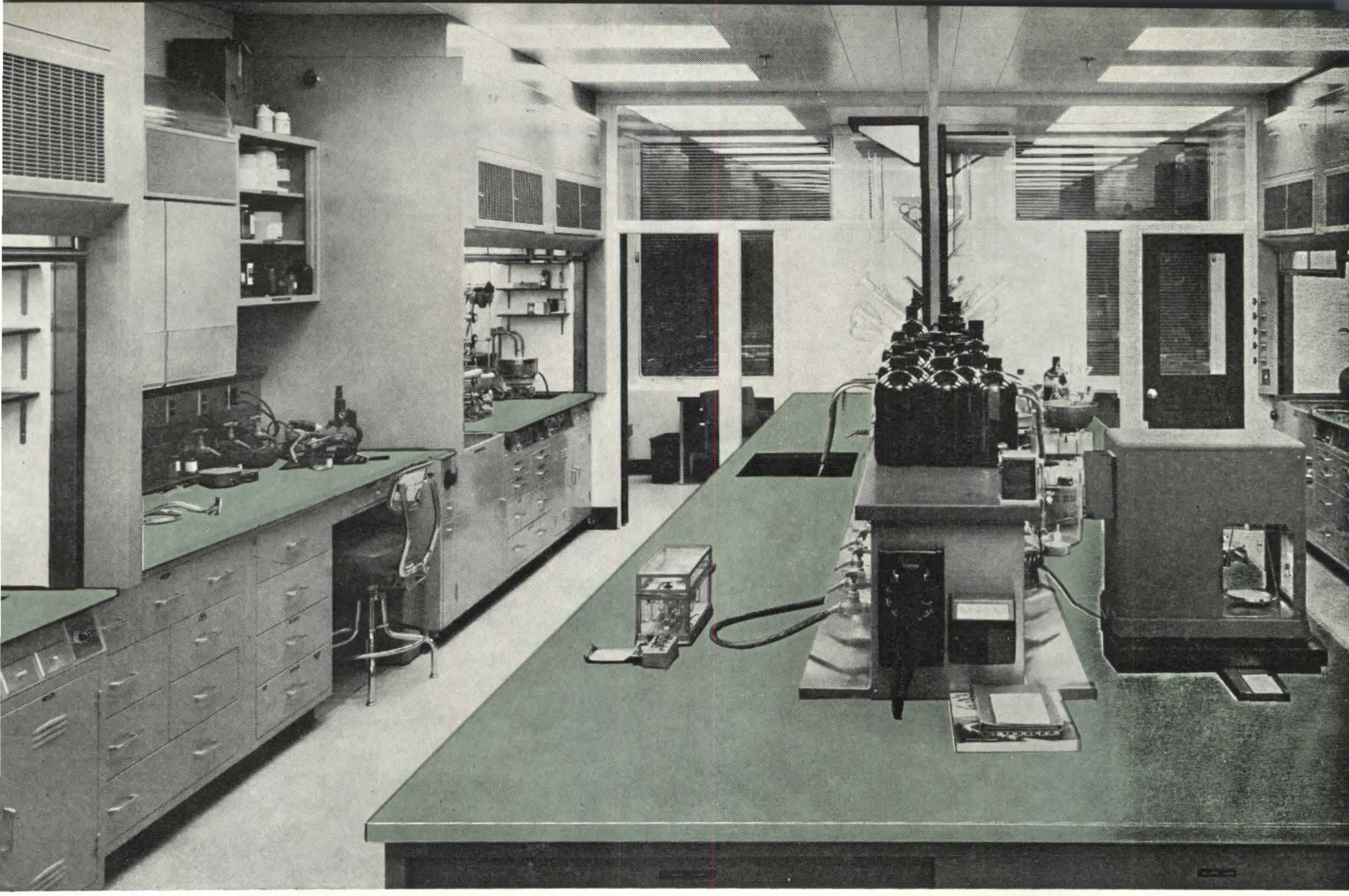


STURGIS
700 LINE

On Readers' Service Card, Circle No. 439



On Readers' Service Card, Circle No. 423 ➤



# KolorMate® gives you the FINEST FINISH

## of any asbestos-cement product for research-laboratory table tops.

Research-Laboratory Counter Top

Fume Hood and Table Top

Nicolet's KolorMate, a monolithic asbestos-cement material, is fast becoming the first choice of architects, industrial designers, and laboratory planners for use in laboratory-furniture applications. KolorMate is well known as an acid and corrosion-resistant material which can be machined and cut using techniques common to stone fabrication.

The superior finish of this monolithic asbestos-cement material is a unique attribute of Nicolet's KolorMate, and it provides the architect with a product which combines the elements of functional design with the esthetic appeal desired in today's working environments. KolorMate is available in Charcoal Grey, Cocoa Tan and Bermuda Green, in all popular thicknesses.

To all the advantages of KolorMate, add finish for the final touch, by Nicolet, naturally.

Send for our 1966 KolorMate brochure. Write Nicolet Industries, Inc. Florham Park New Jersey.

**nicolet** INDUSTRIES INC.

On Readers' Service Card, Circle No. 406


Dimensional Fiberglas* acoustical products last and last and last. Their beauty lasts. Their texture lasts. Their quieting effect lasts. And so do those washable vinyl surfaces. Practically maintenance-free, too. Can't warp or sag or buckle. And Fiberglas shrugs off construction and building moisture. Guaranteed. All this and a wide range of textures, finishes and large sizes to choose from. Choose.

To see how really big that choice is, write: Owens-Corning Fiberglas, I & C Division, 717 Fifth Avenue, New York, N.Y. 10022.

OWENS-CORNING
FIBERGLAS
T.M. REG. U.S. PAT. OFF.

U$E
DE

Dividend Engineering—to stretch your building dollar while improving building performance. *T-M (REG. U.S. PAT. OFF.) O-C. F. CORP.



On Readers' Service Card, Circle No. 411

*October 1966* **PROGRESSIVE ARCHITECTURE**

*"Concrete is mud. I work with concrete, not against it. I like mud."*

PAUL RUDOLPH

*"Thinking about the future of concrete, we would have the best concrete when we don't use cement at all. If we could develop an epoxy plastic and use it to replace the cementing action in the mix, we could produce a material like granite. Such a mixture would not be subject to plastic deformations, and would not change in the course of time. This, to me, would be the future of concrete."*

**DR. AUGUST KOMENDANT**

## EDITORIAL

**Permanence** is one of the characteristics of concrete. Not only does it increase in strength with age, but it is also weighty and, usually, bulky. Architects, as a rule, like the idea of indestructibility. Since much creative effort and hard work is involved in putting up a building, most architects resent the premise of disposability and avoid it as if it were some kind of architectural psychalia. Which is probably one reason for the growing popularity of concrete as a building material.

And yet, disposability is only a near cousin of flexibility, a concept pretty well established in the profession. In an age of vast and fast changes, permanence, in spite of its emotional allure, is simply not practical. Architects all over the world are discovering this. For example, countries that have an advanced concrete technology (such as Hungary and Poland, which I visited recently) are now re-evaluating the wisdom of building with large, load-bearing panels of prefabricated, reinforced concrete, a system popular there until recently. In Poland, there is already a tendency to build skeletal apartment houses of prefabricated concrete beams and columns only, rather than solid structural walls, so that walls could be knocked out in case of future changes in housing standards. This cannot be done, of course, with load-bearing box construction. Apartment sizes are frozen for generations to come, unless the building is dynamited and another one built in its stead. Thus, the size and type of concrete elements is a subject of live controversy in a country that goes all out for prefabricated concrete construction.

Another controversy centers around the question of how complete the prefabricated elements should be. One school of thought claims that the logic of prefabrication indicates as complete a unit as possible, and that finishes should therefore be applied before erection, not after. The opposing school looks at the results and says that building construction is a rough operation and that repairing damages inflicted on finishes during erection offsets any saving in time, labor, and material, and that, logically, finishes should therefore be applied after erection is completed.

To go back to the subject of permanence: One of the effects of standardization of building design and industrialization of building construction in Poland is the diminishing need for architects. After the basic design problems of the prototypes have been solved, the engineers and builders take over the details of production and erection techniques. Result: A severe recent cutback in Polish architectural offices left many architects jobless and a substantial number had to seek work in other countries. Presently, some 200 Polish architects are working in France, for instance. The irony seems to be that, after contributing to the creation of nondisposable buildings, they became disposable themselves. ■

Jan C Rowan

# CONCRETE: WHERE DO WE GO FROM HERE?

Exactly six years ago, P/A devoted an issue to concrete technology. It was a time when we thought that exposed concrete construction would become a major force in building design. This proved to be true. Now, a little more than half a decade later, after considerable work in concrete has been done, P/A editors solicited a wide variety of opinion to assess the present state of the art. As a result of our investigations, architects, engineers, contractors, and manufacturers air their views on the following pages, discuss methods and techniques, and assess the economics of this basically humble yet tricky material.

# THE EXPERTS ARGUE

Exposed concrete came in with a bang. Will it go out with a whimper? In an explosive discussion, the answers are provided by those producing the fireworks.

## PUTTERING WITH THE POTENTIAL

"Concrete is like stone; it should be in the graveyard," says A. Farch, a construction superintendent. By puttering with the potential, is the architectural profession making the future of concrete as dead as Farch thinks?

To the undoubted joy of the concrete industry, the great majority of architects do not share Farch's cynicism. They are agreed that, theoretically, the potential of exposed concrete is virtually untapped.

However, discontent with present performance was as widespread as enthusiasm for its prospects. From Canada to the United States to the Fiji Islands, architects made the same complaints, despite regional boundaries and wide climatic variations. They complained of poor control, lack of contractor responsibility, and design inhibitions caused by codes and labor.

It is possible that this discontent is the result of the natural growing pains in the development of a new material. If this is so, we can expect to solve present problems on the road to final realization of concrete's ultimate potential.

However, the very universality of difficulties may indicate insurmountable practical problems—difficulties that will bury concrete as an architectural material. Concrete would then take its place as just another "aesthetic fetish."

### The Enemy Within

All of concrete's difficulties do not come from outside the designers' office. Design concentration upon finicky precision as a hangover from the shiny new metal curtain wall building era strains the use of concrete both technically and economically.

Is there a justification for manicuring "mud"? Should concrete technology be strained to produce "cookie cutter shapes" more expensive than granite, but with no assurance they will be one-third as durable? Is making silk purses out of sows' ears the way to explore the potential of concrete or to kill it? Few architects can "take it or leave it alone." As Herbert Riemer of Morris Ketchum, Jr. & Associates states, "If concrete needs more refinement, why do it in concrete?"

Concrete technology is clearly divided into two manufacturing processes: cast-in-place and precast. Cast-in-place for the most part follows the mold of two-dimensional structural systems, because its economics has prevented exploration of the logical multidirectional strength of its plasticity. Precast without prestressing has been successfully used structurally only in low-rise buildings. With the introduction of stressing, multiple units can climb into the air, limited only by the abilities of hoisting equipment.

But is the combination of separate elements, similar to heavy timber construction, actually exploring the potential of concrete? Is not the assemblage of components a negation of the monolithic sculptural plasticity which, most architects assert, is the chief virtue of concrete?

### Plastic Panacea?

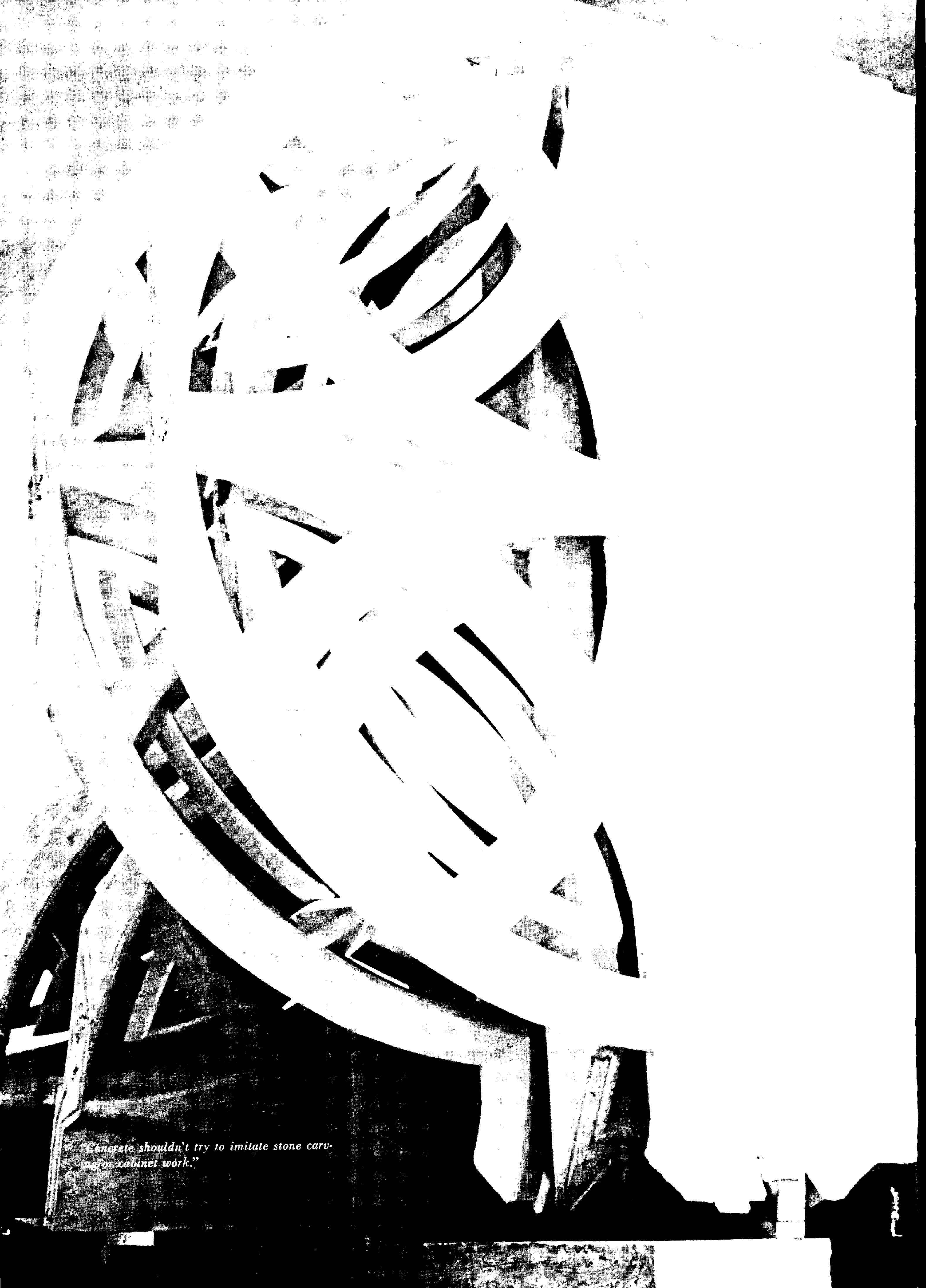
Whether the ultimate potential of exposed concrete is ever developed from its present infancy, or is relegated to the graveyard to be buried hardly more than stillborn, may be beyond the control of the architectural profession.

A general demand is being made for the development of a new material that will have the plastic virtues of concrete and none of its weighty faults. Many architects feel that they need a sort of super loadbearing silly putty. It would be a lightweight substance impervious to water, easily formed, without plastic flow, foolproof in handling, and carrying automatic code approval. In other words, a material giving unlimited design freedom, with no practical limitations.

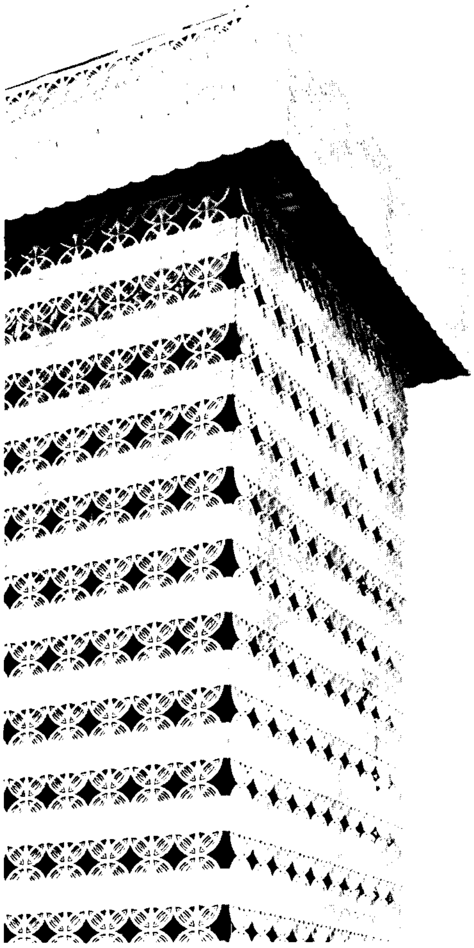
Perhaps this is a material only to be found in an architects' heaven. However, if it comes into being on earth, it will realize the theoretical potential of concrete as a building material by overcoming concrete's practical limitations.

"I don't think that concrete needs any improvement," says Werner Seligman, Cortland, N. Y. "I'm satisfied with it as it is."

"Maybe so, and maybe not," comments Farch. "In the meantime, give me brick. That's a material a man can trust."

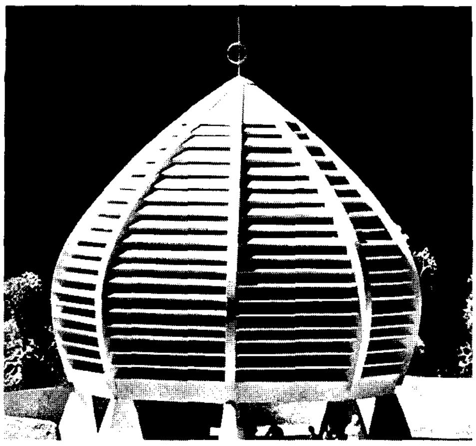


*"Concrete shouldn't try to imitate stone carving or cabinet work."*



"Cookie cutter shapes."

MOSQUE, UNIVERSITY OF EAST AFRICA, DAR-ES-SALAAM, TANZANIA

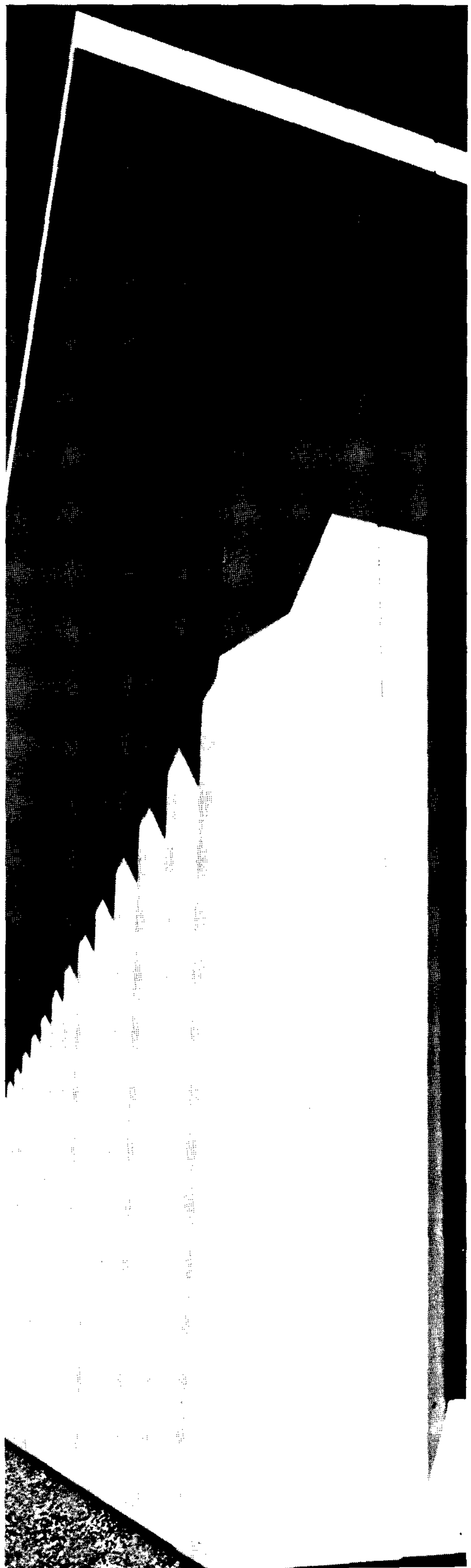


ARCHITECTS: MCMILLAN, GRIFFIS & MILETO.

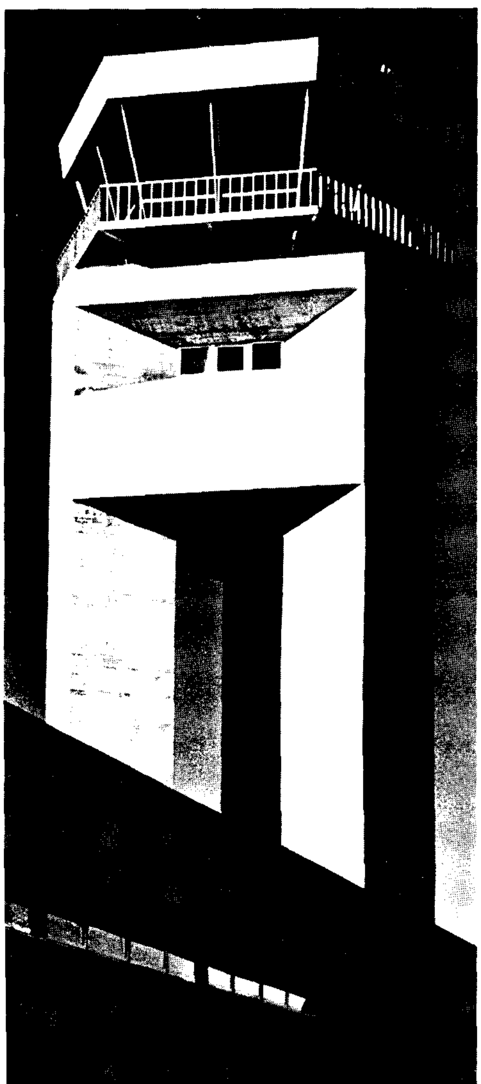
"Combining heavy elements."

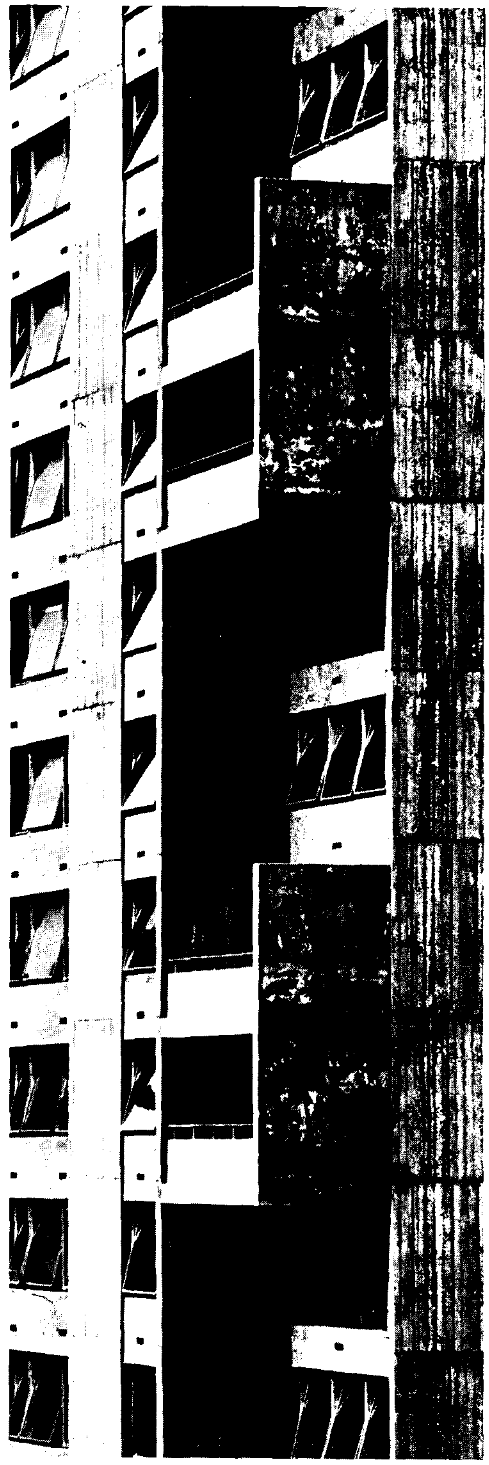
"Assembled components."

N. J. BELL TELEPHONE CO., NORTHERN AREA H.Q., HANOVER, N. J. ARCHITECTS: FRANK GRAD & SONS. PHOTO: PHOTOG



"Precision."



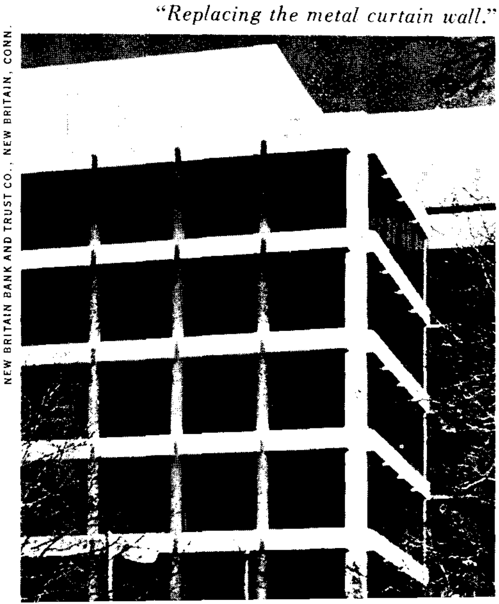


CHATHAM TOWERS, NEW YORK CITY. ARCHITECTS: KELLY & GRUZEN.

"Unmanicured mud."

"Replacing the metal curtain wall."

NEW BRITAIN BANK AND TRUST CO., NEW BRITAIN, CONN.



ARCHITECT: EMERY ROTH. PHOTO: CUNNINGHAM-WERDNIGG

# DOES CONCRETE WORK, WORK?

"We could have given you this concrete for one-third the price, if the building had been a warehouse instead of a church." So said a contractor after realizing that the designer wanted rough concrete walls unretouched after stripping the forms. To avoid such misunderstanding, architects will either have to disguise the purpose of a building or educate contractors.

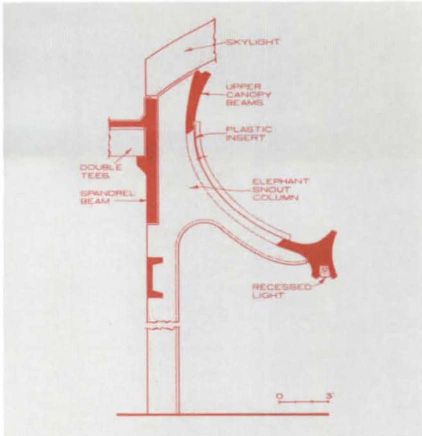
Paul Rudolph continually struggles to make contractors leave concrete untouched after stripping forms. "It's virtually impossible to get concrete contractors to leave it alone," says Frederick Frost, a New York City architect. "Few workmen seem to know how to patch a surface without becoming obsessed with patching and grinding, which defaces it."

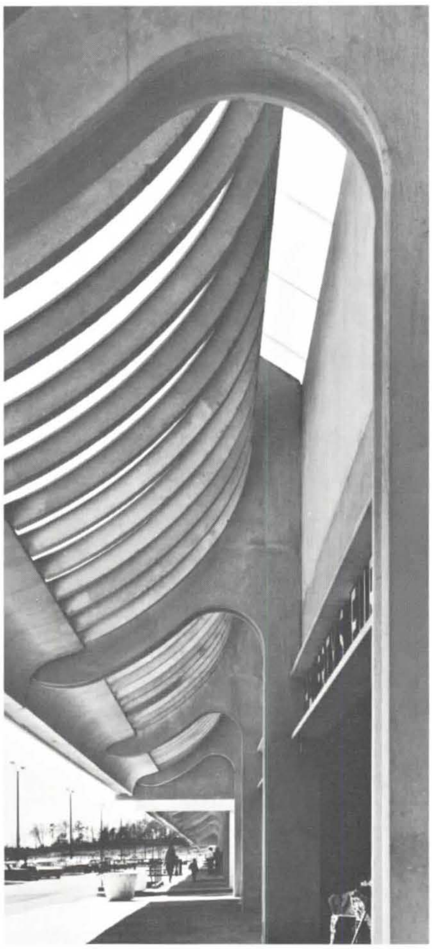
Somewhat pessimistically, Wayman Wing, a New York City consulting engineer, says, "It is almost impossible to train a contractor to produce rough concrete with the sophistication of Corbu's work."

Rough or smooth, both textures cause problems. Following a difficult and expensive contract with a smooth-finished concrete façade, Richard Roth, Jr., of Emery Roth & Sons, noted, "After years of hiding concrete, masons do not psychologically comprehend the need for exposing it."

Concrete contractors offer to give any exposed surface that is called for. Some finishes are easier than others: "We can do a better job by accenting the form marks or removing them by sandblasting, bush-hammering, or corn brushing," says Vince Kelly of Brennan & Sloan Inc., a New York City concrete contractor.

Some contractors claim that an exposed concrete surface is cheaper than limestone, masonry, or granite, but many architects report that they switched from concrete to another material because concrete was too expensive.

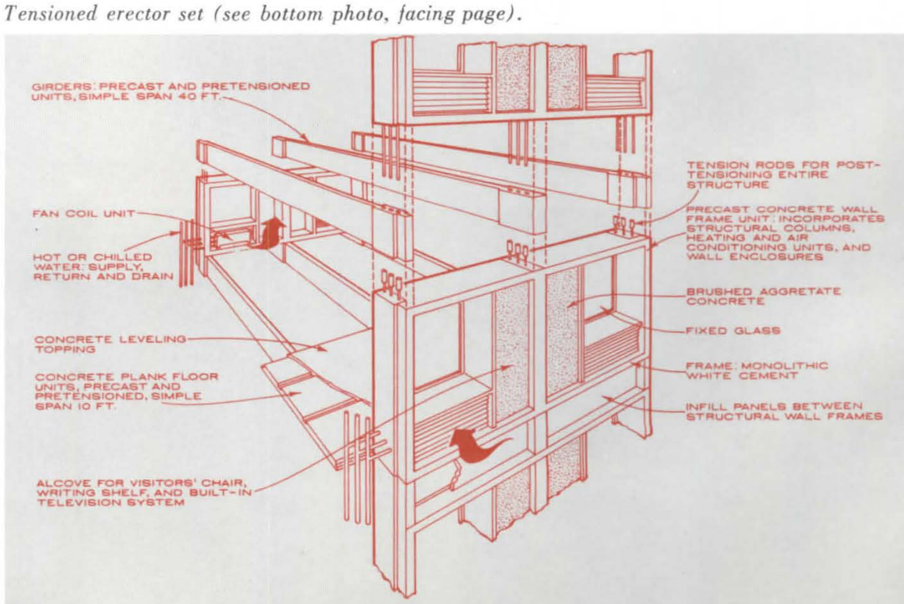


GREENBRIAR SHOPPING CENTER, ATLANTA, GA. ARCHITECTS: EDWARDS & PORTMAN, ATLANTA.

*Stressed canopy.*

*Tensioned erector set (see bottom photo, facing page).*




## Plastic-Formed Boardmarks

If integrity is not at a premium, concrete can be made to look like other textures. "We can reproduce practically any surface you want," says Harry Darby of Winner Manufacturing Co., Trenton, N. J. Winner makes glass-fiber-reinforced-plastic molds with slate impressions in the surface so that concrete will have the exact appearance of slate.

Darby also points out that the company could make forms with rough board marks on the surfaces. This, presumably, would enable an architect to make pencil rubbings of his idols' concrete work, and precisely reproduce the random board pattern on his own work.

Contractors would not hesitate to try casting unusual textures. Says one in St. Louis, "In this business, you have to move with innovations in order to keep your head above water." Another concrete contractor sums up the whole question of finishes: "If you spend enough money, you get a good job."

Few architectural clients come on the scene with enough money. An architect must supplement richness with skill. Good finishes are obtainable, but they need a thorough understanding of the capabilities of the materials. "The greatest problems arise when concrete is expected to perform beyond its capabilities," says Leonard Bell of Smith, Hinchman & Grylls Associates.

Not everyone wants to leave concrete untouched. Many designers and contractors advocate coating the surface. Hausner & Macsai, Chicago, say they are successful with concrete only when coated. Clifford Stewart, of Perry, Dean, Hepburn & Shaw in Boston, feels that the aesthetic purity of epoxy coatings may be questioned, but they do enable an owner to keep up the appearance of a building.

## Will Success Spoil Contractors?

"We have trouble finding contractors who can visualize the capabilities of concrete and will not persist in underestimating the difficulties involved after we point them out. We also find difficulty in obtaining accurate cost figures in advance of bidding." These remarks, by Ronald Gribble of Fisher, Nes Campbell & Partners in Baltimore, summarize the experience of quite a number of architectural firms.

Some architects believe that success spoiled many contractors and made them cautious of anything but an odds-on favorite. "Contractors won't gamble on the end product that designers are trying to create," says Wayman Wing.

"Concrete suppliers have been so busy that physical performance rather than innovation has been the problem," points out Earl Flansburgh of Cambridge.

And Walter Netsch, of Skidmore, Owings & Merrill's Chicago office, is concerned "... about the reticence of ready-mix concrete suppliers in using special cements and mixes that may place a burden on their broad-scale use of supply yards. This occurs because good exposed concrete requires a careful series of sample studies of cement, aggregate and sand."

Looking at the broad view, Netsch adds, "As the construction market continues in scale, there is less desire to expand the potential. This may also be justified criticism for architects."

Clients, too. Remarks B. Sumner Gruzen of Kelly & Gruzen, "The city, state, and Federal governments have not been easily persuaded to try new techniques."

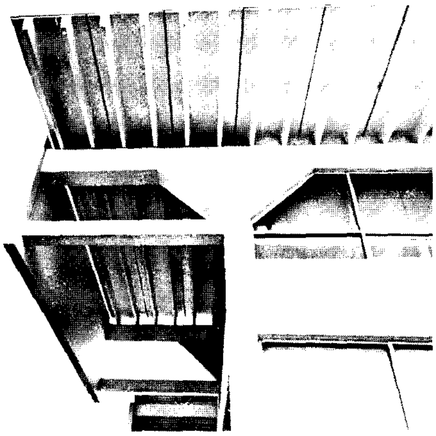
It is not always the contractor who drags his feet. "Probably no supplier feels his materials are being fully exploited," says Albert Litvin of the Portland Cement Association. The reason for this may be that architects don't have time to exploit new materials. Says Flansburgh, "Architects did more experimenting in the 20's and 30's because all they had to do was sit around. Now they are so busy they don't have time to experiment."

Architects also decry the attitudes of contractors who cannot be bothered to train men, or still follow familiar techniques when better ones are available. Edwin Steffian of Boston comments,

SILVER STATE SAVINGS AND LOAN, DENVER, COLO.

ARCHITECT: W. C. MUCHOW. ENGINEERS: KETCHUM, KONKEL, RYAN & HASTINGS.

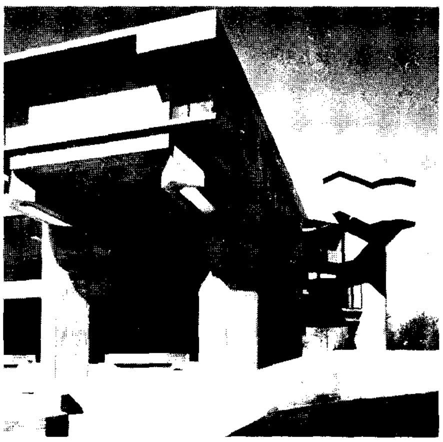
*Light fantastic.*



GALVESTON NEWS BUILDING, GALVESTON, TEX.

ARCHITECTS: HOWARD BARNSTONE, EUGENE AUBRY.

*Concrete fit to a T.*



SOUTHEASTERN MASSACHUSETTS TECHNOLOGICAL INSTITUTE.

ARCHITECTS: PAUL RUDOLPH, DESMOND & LORD, INC. PHOTO: ARBER-FRENCH & CO.

*Board and block precision.*

PETER BENT BRIGHAM HOSPITAL.

ARCHITECTS: THE ARCHITECTS COLLABORATIVE PHOTO: PHOKIAN KARAS.

"Formwork lines and blemishes are often due to lack of care by a contractor who ignores instructions in specifications and drawings."

"The average contractor," points out Gyo Obata of Hellmuth, Obata & Kassabaum, "is not used to the idea that his bid carries the responsibility to do careful formwork, mixing, casting, stripping, sandblasting, and so on."

## What Workmen Put Into It

Sometimes a contractor is big with words but short on deeds. A partner in a venerable architectural firm claims that the head of a large contracting company talks a lot about good construction practices for concrete work, but does not see that his men know about them: "When I remonstrated with a carpenter for urinating into formwork, the man said nobody had told him about good practices."

Leonard Bell does not mention toilet training, but does notice a lack of craftsmanship in formwork, and would like to see "finish" carpenters employed for architectural concrete.

The craftsman, believes Bennie Gonzales of Phoenix, Ariz., "... can cause irreparable damage, raise costs of special techniques, or he can be invaluable to a project." The Southwest, he notes, has an imbalance of unskilled workmen, which is aggravated by subcontractors unfamiliar with technical developments.

Yet the northeast region of the U.S., where many designers and contractors are concentrated, generally looks to other regions for advances in concrete. Ira Hooper of Seelye, Stevenson, Value & Knecht, consulting engineers in New York City, feels that the South and West are head and shoulders above technical developments in the Northeast. H. T. Noyes, chief engineer of Turner Construction Corp., agrees with him.

It is not only contractors who err. Hedley Roy of John B. Parkin Associates, Toronto, believes that we have inadequate technology and that there is a natural resistance to change on the part of designers and contractors.

One of the larger design firms, Welton Beckett & Associates, reports that major contracting companies are always willing to cooperate creatively with the architect and his engineers. Contractors often suggest erection techniques that aid in establishing pioneering designs.

Peter Morton of The Architects Collaborative, Cambridge, Mass., compliments the professional approach of many subcontractors, especially the formwork subcontractor on a recent TAC job: "They influenced the design in many ways, such as where the form joints should be, what size panels can be used, and where to put the form ties. I am thunderstruck at the importance of the form men."

## The Precaster's Viewpoint

If a sub influences a job, be sure to find a good influence. For precasting work, listen to a precaster, Tom Nolan of Tecfab, North Arlington, N. J.: "If the men running a manufacturing plant have not been working in a successful architectural concrete precasting plant for at least five years, the company isn't worth a damn. Furthermore, its products are a definite risk to the successful completion of a building."

Nolan states it is not an easy business. He has frequently seen manufacturers go rapidly broke: "They think that all they need to do is make a mold, fill it with concrete, strip the mold, and ship the product to a site. But the technology of precasting is quite complex, and the rewards are slow to materialize."

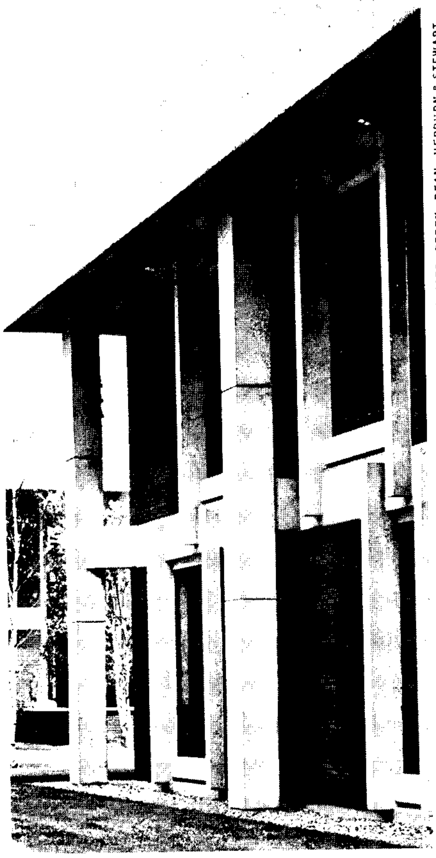
Some architects may have met the type of precasters mentioned by Nolan. Dan Toan, of Warner, Burns, Toan & Lunde, New York, N. Y., feels the precasting field is not up to what it should be: "It is competing with the stone business, and isn't set up to compete with cast-in-place concrete."

Contrariwise, Raymond Epstein of Epstein & Sons, Chicago, believes that "the precast concrete industry is well advanced with its product, but the cast-in-place field leaves much to be desired."

To capitalize on the benefits of precasting, a designer must repeat himself. "It is necessary to design repetitive elements to allow the precast-concrete contractor to compete economically," points out an architect. Fine, replies a precaster, "but few members of the profession think this way. A designer can add $3 per sq ft to the cost of a building just by neglecting to think about the precaster's problems of repetition."

## Performance, Weather, and Research

"The major difficulty is the difference between work specified and work performed." This message, in one form or another, comes through loud and clear from many architects. Sumner Gruzen:



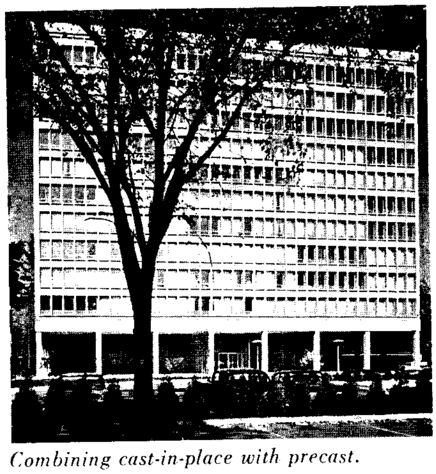
*Expressive skeleton.*

JANET WALLACE FINE ARTS CENTER, MACALESTER COLLEGE, ST. PAUL, MINN. ARCHITECTS: PERRY, DEAN, HEPBURN & STEWART.

*The Government gives it a try.*

FORRESTAL BUILDING, WASHINGTON, D.C.

ARCHITECTS: FRANK GRAD & SONS. PHOTO: LOUIS CHECKMAN.



*Combining cast-in-place with precast.*

DEARBORN TOWERS, DEARBORN, MICH.

ARCHITECTS: KING & LEWIS. PHOTO: LENS-ART.

"It's often necessary to perform corrective treatment to concrete to obtain an acceptable finish. The alternative is to demolish the work and cast it again."

So, concrete, to no one's great surprise, has limitations. At the design level: "Like any other material, concrete is no guarantee of unqualified success." In close-up: "I'm disappointed at the staining, spalling, and cracking." And in cost: "Limestone is cheaper."

Concrete stands up better in some climates than others. Boston is in a bad zone, according to Herman Protze, a concrete consultant, because of frequent freeze-thaw cycles each winter. Colder regions are less exacting, because they freeze up for the whole winter.

Wallace Harrison, of Harrison & Abramovitz, remarks, "Our office believes that carefully supervised concrete will work in New York City's climate, but I do not agree."

There's a lot to be researched in weathering, as well as many other aspects of concrete. "Industry should take more of a lead," says Frank Grad. "For a recent project, we had to finance developments that businesses with research resources should do. Unfortunately, too many companies make too much money to want to improve technology. The amount of money not spent on research is amazing."

Many architects believe concrete to be late blooming. Flansburgh says, "Only recently have we begun to see the true plastic capability of the concrete." And Sepp Firnkas, a Boston consulting engineer, comments, "Only in the last few months have designers begun to understand that concrete is not just a structural element, and also has no justification as a curtain wall."

## Slump Causes Problems

"Concrete isn't a poor man's stone."

"Concrete shouldn't try to imitate stone carving or cabinet work."

Right. Concrete is concrete, and does not have to be dressed up. But it does have to be good concrete, and that calls for controls. "It's such a simple material, but with such little control," points out an architect. "There is an over-all lack of responsibility for the suppliers of sand, aggregate, and cement," says Grad.

Specifications provide part of the control, but the experts believe the specs should not be rigid. "Don't tie down the contractor too hard," warns a contractor. "Rigid specs cause the costs to exceed budgets," emphasizes an architect. "Tight specs enable an architect to police a job during construction," says an engineer.

Ask a concrete contractor what single item causes most trouble, and the answer invariably is slump. Many contractors do not give it sufficient consideration, claims a concrete sub. But Kelly gives it a lot of thought: "It's very difficult to control slump when concrete is discharged from a mix truck in 90 F weather and passes through four or five containers to reach the forms on the thirtieth floor of a structure."

## Changed Mixes

In the six years since P/A's last issue about concrete, its strength has risen: 5000 psi is now commonly called for in place of the former 3750 psi. Steel strengths increased with concrete. Yield strength for A432 steel is now 60,000 psi, with a working stress of 24,000 psi. In 1960, the working stress was 20,000 psi.

Design methods are also changing. Some engineers are designing columns by ultimate strength methods, instead of by working stress formulas. Designers also adapted the composite action usually associated with concrete slabs and steel beams, and applied it to precast concrete beams and cast-in-place slabs.

Material suppliers can guarantee better uniformity of grading, and batching plants offer scientific control of the materials passing through the hopper. It is not all perfect though, and Ira Hooper suggests that the ASTM C33 standards for soundness requirements of aggregates are not stringent enough to prevent trouble with concrete.

Mixes will undoubtedly change, but Melvin Charney of Montreal foresees an expanding concrete—a really lightweight, fast-setting, dimensionally-stable material that can fulfill some of the dreams of an instant architecture.

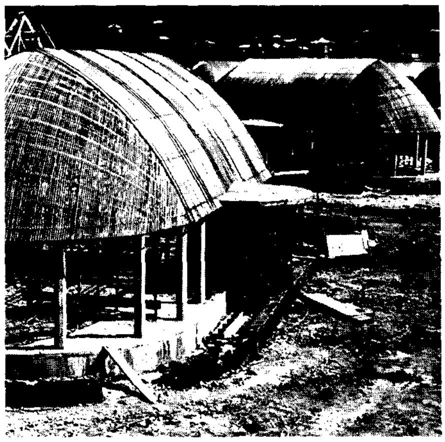
## Concrete Breaks the Cost Spiral

"We have barely reached the frontier of concrete in socially important architecture because of its cost," claims Ralph Everett Harris of Hampton Beach, N.H.

"Financial exploitation and speculation reduces the problem to simply a question of costs," believes Gonzales.

Two views, opposed by a third. Stewart says, "Concrete is not dictated by cost but by aesthetics."

Techniques may not lower costs, but



*Native craftsmen thatch local materials into framework for pneumatically-applied concrete roofs (photos this page).*

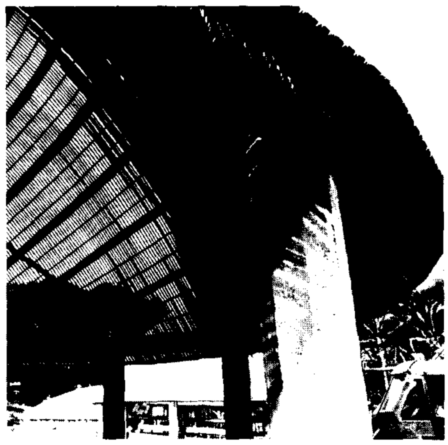


PHOTO: KAY PURINTON

HOTEL INTERCONTINENTAL, PAGO PAGO, AMERICAN SAMOA. ARCHITECTS: WIMBERLY, WHISENAND, ALLISON & TONG, LTD., HONOLULU, HAWAII.

material suppliers do. Concrete has not risen in costs anywhere near the same rate as other materials. Despite rising labor, steel, and lumber costs, the price of concrete remains stable. Cement now costing under $4 a barrel cost about $5 five years ago. This can be attributed to automated cement plants, which circumvent rising labor costs and also raise productivity. Larger mix trucks, carrying three times more than the older, 5-cu-yd trucks, help to steady the unit cost of concrete.

Labor appears to influence the cost greatly. George Cohen, Euclid Contracting Corporation, who has a first-hand experience with labor, says that unions are forcing up wages to the point of ruining industry.

## Formwork Makes the Job

Departing from the conventional view of casting concrete in a mold, Harris comments, "Since building formwork involves more work than casting concrete, the formwork becomes predominant and should be viewed as a positive element. The finished concrete is a negative element. Thus it may be more important to design a building in terms of its formwork and view the finished product as a negative resultant."

Many architects are aware that there is more to formwork than setting up boxes for concrete to be cast into. Many want a better method of molding concrete. And they certainly want a cheaper method.

Caudill, Rowlett & Scott offer sound "feet on the ground" advice about forms: "Forms must be watertight to prevent honeycombing. In Britain, some specs call for forms to be filled with water overnight, and not exceed a maximum leakage."

Steel forms will avoid leakage, but are not economical unless copiously re-used. Moshe Safdie, designer of Habitat (see p. 226), is happy with steel forms: "There's something about the smoothness of steel form finish that's appealing. Rough surfaces with fins and bushhammering avoids certain finishing problems, but uses concrete in a sentimental way."

Fiber-glass forms also give a smooth finish, and some manufacturers say they can give better tolerances with fiber-glass than with steel. The Winner firm says it built a 42-ft-long form for a prestressed unit that checked out within 1/16 in. Safdie's 38-ft-long Habitat units are cast to 1/8-in. tolerance in steel molds.

PHOTO: MOULDED FIBERGLASS CO.

# WHO BOSSES CONCRETE?

*"Give a Dog a Bad Name and Hang Him."*

Concrete control proves to be the bad dog of architect, engineer, and contractor in the following dogfight. Before proceeding to find who is top dog in the arena, we might consider the nature of the beast from an impartial referee.

"Specifications should be truthful; they should not weasel something out of a contractor," maintains Herman Protze, a consulting engineer who runs a materials testing service in Newton, Mass. "An architect must convey his philosophy to his engineers, so that they can interpret what he wants to do with concrete, and both architect and engineer should listen to a good specialist."

"Testing labs," believes Protze, "should operate under a code of professional ethics, like architects and engineers." He condemns labs that charge a client $3 an hour for inspectors, for this low fee means that the lab has to pay men performing this essential function less than the architect pays his plan clerk.

"A good testing laboratory," Protze continues, "should be experienced, knowledgeable, and sympathetic to what the client wants to do." A good specialist will write specifications that result in the type of concrete an architect hoped for when he conceived a project.

Protze treats specifications as a narration that guides the contractor through what the spec writer believes to be the best way to make and place concrete. There is no point in writing inviolate, precise instructions for a contractor, because, if the quality of the resulting work is unsatisfactory, the contractor will say he followed the specs to the letter and the result is the architect's responsibility.

A spec should guide a contractor on quality of forms, dimensional tolerances, tightness of forms, methods of designing, measuring, mixing, and placing concrete, and so on. "When drafting a specification, ask yourself or a qualified contractor if what you call for is feasible," he cautions.

To implement specifications, Protze recommends asking the contractor who wins the bid to build full-scale mock-ups of parts of the architectural concrete work. These samples, after approval by the architect, become standards for reference during construction, but they must be built under the supervision of the testing lab or the consultant under true job conditions. He also suggests the architect first make pre-bid mock-ups of parts of a building to check that its architectural embellishments are practical in concrete, and to serve as reference during bidding.

To describe an acceptable quality of appearance, Protze has innovated a clause in concrete specifications: Concrete, when viewed under good lighting from 10 ft, should be pleasant looking, and, from 20 ft, should not show imperfections. "This clause may sound silly," holds Protze, "but people can attune to it, and the approach is surprisingly reasonable for determining acceptability."

## Do Codes Restrict Design?

The quality of the concrete is, of course, important, as Protze points out. But there are factors other than the material that affect the design of concrete.

Building codes may restrict design. The degree of restriction varies throughout the country. In New York City and some parts of California, the code is presently being revised, and seems to be keeping pace with new realities.

Larger architectural firms generally claim they are not too restricted by codes. This could be due to their being in a better position to negotiate variances. However, architects working individually did not all agree that codes were a restriction. "Hiding behind codes is a punk excuse," maintains Paul Rudolph.

On the whole, there was not enough clean-cut agreement or disagreement in the survey to dog down the codes for totally hampering good design. "Codes are a continuing process and most are being brought up-to-date to include the use of modern practices and techniques," comment Kahn & Jacobs.

A painful truth was pointed up by Clifford Stewart: "Codes may hamper, but brains and motivating hamper more than codes. Remember that architects, engineers, and builders write the codes."

## Does Labor Hamper Design?

Trade practice came in for more damnation than codes, although there is by no means a consistency of opinion.

"All of our problems and successes revolve around one word—quality," says Leo Kornblath of New York. "Unless an extraordinary amount of time is spent by the architect above and beyond any fees he might be receiving, an outstanding installation cannot be obtained. The lackadaisical attitudes of foremen and workmen —or perhaps it is their lack of interest and knowledge—result in an installation that is less than successful. Satisfactory finish can only be achieved by an excessive amount of time and money."

"Trade practices and techniques pose some serious problems in the use of exposed concrete. Unions have balked at using new techniques," holds Fred Severud. Drawing from his considerable experience as a consulting engineer, he lists labor controls that hamper design and quality:

- "Site precasting is certainly severely hampered by arbitrary regulations imposed by labor.
- "The cost of properly curing concrete on site or in precasting plants, is apparently tacitly omitted during the turmoil of competitive bidding. Chronic deficiencies in curing exist throughout the industry—cast-in-place and precast alike. The full effects of this may not be known for several years to come.
- "There is room for considerable improvement in placing and vibrating really low-slump concrete. Perhaps through bad habit, the workmen themselves exaggerate the advantages of wet, high-slump concrete.

"There still seems to be too great a lag between the quality specified and that consistently achieved in practice," Severud concludes.

Engineer V. F. Leabu of Giffels & Rosseti, Inc., Detroit, agrees with Severud: "Trade practices always tend to seriously lag behind current technology. Producers of precast units do not seem to understand the technology basic to what they are trying to do. New practices do not lend themselves to rule-of-thumb approaches."

Not so, according to Roger Corbetta, a leading concrete contractor: "Quality control is the responsibility of the contractor. Engineers dilute responsibility when they attempt to share it."

## Does Government Retard Design?

Problems of quality and control do not seem to loom as large in bridge and highway construction. Hardesty & Hanover, New York City consulting engineers, describe their procedures: "We use a design mix at all times. Quality in concrete is a function of control and supervision. If a transit-mix truck mixes in transit, so that there is no way of knowing the actual mixing time, the entire truck load should be rejected."

In describing the control exerted by state highway departments, Hardesty & Hanover were complimentary: "State highway staffs are professional organizations. They give us excellent control."

The one area that seems to evoke a good deal of agreement among architects, engineers, and contractors was that lack of control on Government construction was a Barry Goldwater dream. Pointed out one major New York architectural firm, "Federal control is the worst, but only a little below that is state control, and a little below that is the city."

Four of the top members of Smith, Haines, Lundberg & Waehler, including the chief structural engineer, declared that more important than the type of construction, either precast or cast-in-place, was whether the client was a private individual or a governmental agency: "Our experience so far has been that if it's Government work, forget about the precast stuff. We even like to stay away from concrete itself as much as possible. You don't have any control over the bidders, in either city or Federal Government."

When asked if the condition would change if the architect had adequate supervisory rights, they replied, "It's hard to get blood out of a stone. If you don't have a qualified contractor you can supervise all you wish, but what will you do, make him tear down all he puts up?"

"It's enough to make a man want to overthrow the Government," says Farch, archly.

A group of principals of the Frank Grad office in Newark were in full agreement in condemning lack of control on Government buildings. They cited their dilemma in having to work to Government specifications, although the Government did not yet have such specifications. On one particular job, the Grad office had a sample panel fabricated prior to bidding to show the quality of the concrete they wanted. The successful bidder had a panel made to show them the type of concrete work they were going to get.

Herbert Riemer speaks bitterly of the disappointment of a firm trying to produce competent architecture for Government projects: "How many opportunities do you get for design service? We have financed design well above fees, only to have our efforts thwarted by poor construction over which we had no control. Many of the contractors on public agency work bid the job by weighing the plans. They are bidding to the kind of market that is geared only to inferior types of construction."

## How Professionals See Each Other

The harmony, or disharmony, of relationships bring a lot of growls, but mostly the bark is worse than the bite when either the architect or the engineer puts on the dog about their prime importance. Actually, there is a great deal of cooperation between creative architects and creative engineers, coupled with mutual admiration marred only occasionally by dog fights.

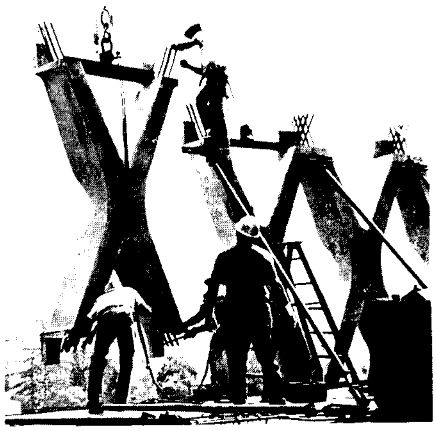
The teaming of engineer and architect has often resulted in new dimensions for concrete design for both architect and engineer.

Paul Rudolph feels that the engineer is an extension of the architect's capabilities, and is subservient to the over-all demands of architectural design. Chip Harkness of TAC states the case similarly: "The factors of the formula, not the formula, are what can give you a yes or no answer."

Wm. J. LeMessurier, a Boston consulting engineer, describes his position on the design team: "To be responsible for selecting the most pleasing form among the alternatives of engineered form is a dangerous pursuit, because I might forget technology. You can forget art as long as somebody else is constantly battling for it. But the architect must not dominate the arena as an artist, leaving no room for me to think with great clarity. It is that type of domination that is wrong."

## The Architect as Master Builder

The extent of architectural control is uncharted. With traditional materials, the tradesman and contractor undoubtedly



AMERICAN CEMENT CORPORATION BUILDING. ARCHITECTS: DANIEL, MANN, JOHNSON & MENDENHALL.

*Marking the spot for a loadbearing X frame.*

PHOTO: COURTESY, MOULDED FIBER GLASS CO.

*Blowing pans.*

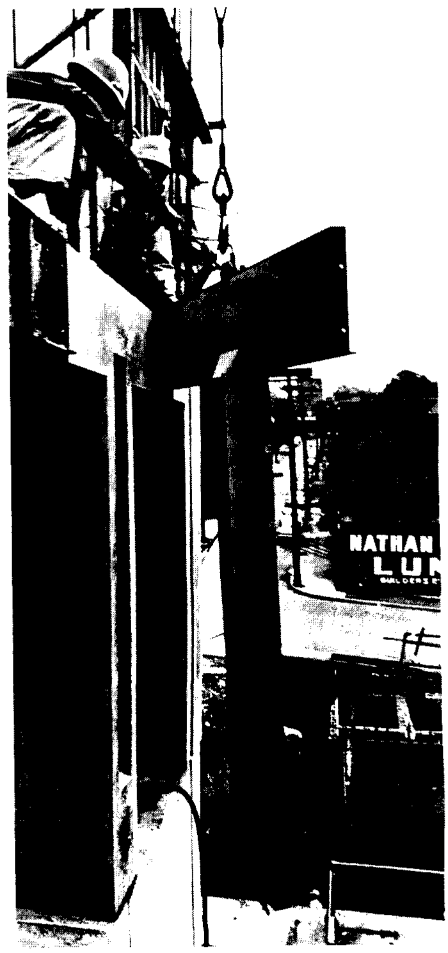


PHOTO: COURTESY, MOULDED FIBER GLASS CO.

*Pulling fiber-glass form.*

know more about their use than the architect. But the introduction of exposed concrete destroyed traditional building patterns.

Architectural concrete needs control that begins at the batching, and ends with the casting. If the architect is to be the master builder in the medieval sense, it seems that he must be a jet-propelled, Hydra-headed Nemesis to the Herculean efforts of the profit motif.

"Control is a matter of carry-through," maintains Tom Kavanagh of Praeger-Kavanagh-Waterbury, architects-engineers. "Greater controls are needed," he continues, "because of the tremendous potential of this remarkable material. As technology improves and greater concrete strengths are developed, the need for stricter controls becomes even more critical."

Another well-known engineer associated with a major architectural and engineering firm in New York City deplores the lack of adequate carry-through in exposed concrete design: "If you watch them pour concrete, sometimes you'll say, 'I'll never walk into that building.' People just dump the thing there with a lack of interest.

"Concrete is designed by an engineer under engineering conditions, and he writes precise specifications. A contractor bids the job, and subcontracts the concrete. But when a test cylinder does not come up to specification, the contractor disclaims responsibility, because the owner had an inspector watching the work.

"The owner claims he didn't mix the concrete, and the contractor had an inspector at the batching plant. The subcontractor feels blameless because it batched to specification and cast under the eyes of the other parties.

"No one has a feeling of responsibility throughout the whole process," he continues. "Even the suppliers may not furnish uniform quality materials.

"What we need is some kind of a national board of certification," he concludes. "But for this to be effective, we have to get people who are financially interested out of the picture. We must have professional people—the architect, the engineer, and the owner."

## The Master Builder: A Change in Cast

"There is no supervision any more," claims a well known consulting engineer. "This is an era of laywers and of getting whatever you can."

His implication that the architect is not the master builder is clearly stated by Grad: "The general contractor is the master builder, and has the option to keep the building up. Once you tell a contractor to do something differently from the way he is doing it, you are dead. The contractor can shift responsibility onto you, the owner's representative, and you end up making the owner responsible for the setting of the reinforcing steel."

However, a committee is working on these problems. A joint AIA, ASCE, ACI committee has been set up to study the problem of control. It is conscious that, if unsuccessful, exposed concrete construction might well suffer the same fate as the metal curtain wall.

There is one other element of control, perhaps the most essential—the architect's man in the field.

The clerk-of-the-works, architectural superintendent, or the architect himself, must coordinate, maintain harmony, and, when "push comes to shove," maintain control. At best he is a master builder; at worst, a useless, underfoot job appendage—nuisance to the contractor, and an unnecessary expense to his employer.

Such men never have their name inscribed in cathedrals, and are known only to the men they work with, from lathing apprentice to design architect. But their influence in quality control is considerable.

## The Supplier Supplies Comments

The last, but not least, influence on control is the manufacturer who supplies the essential components from which the design must be fabricated. Among these is the fabricator of plastic forms, such as William Spurr, sales manager of the Moulded Fiber Glass Co., who maintains, "We are a service business to the construction trades. We offer architects a tool which can improve design, building quality and construction economy.

"We believe in the profit motif and so does our competition. . . . We cannot subsidize design, research, and development *unless* we get our profit at the sale of the end product. There is no purpose in research and development if you can't make a profit.

"Architects should learn the economics of dome (pan) production and use," continues Spurr. "We are not happy about architects designing ceilings for small bank lobbies with forms that don't exist. However, if the same architect can design the entire bank building for the same form, then we are interested. We could go broke if we tried to provide for rental of every size and shape that architects can dream up for small volume use.

"For the most part, we find ourselves doing business with the contractor who has the choice of dome sizes, unless the architect is firm in holding to his specs." Concludes Spurr, "We have worked happily with many architects who know what they want and how to get it."

There, in the words of the representative of one of the largest plastic dome manufacturers, is a summation of manufacturer problems and attitudes to architectural design. The measure of control this manufacturer exercises on design is, of course, the measure of architectural reliance upon standard manufactured components.

Dome manufacturers are noted for their versatility. One manufacturer markets used domes for fishing pontoon floats. They report their hobbies as making plastic coffins and garbage disposal, claiming there is no end to these markets.

"We are dabbling in death. I would suggest a prototype plastic coffin with fiber glass vault combination to replace present concrete vault construction. We could also drive fiber glass pipe liners the same way concrete caissons are driven, and bury families vertically in hierarchical order, starting with grandfather, grandmother, and working up to the immediate family."

So it can be seen that, though lacking design inventiveness in architectural application, some manufacturers are alive to dead ideas. It is only to be hoped that burying architectural design in stereotyped form is not among their projects.

# WILL TASTE FINISH CONCRETE?

## Who Likes It?

*"They builded a tower to shiver the sky*
*and wrench the stars apart,*
*Till the Devil grunted behind the Bricks;*
*'It's striking, but is it Art?*
*The stone was dropped by the quarry side,*
*and the idle derrick swung,*
*While each man talked of the aims of art,*
*and each in an alien tongue."*

RUDYARD KIPLING,
"THE CONUNDRUM OF THE WORKSHOPS"

How is the formless to be formulated, the undefinable defined, or the incalculable calculated? Are there no concrete formulas for concrete Beauty? This is the conundrum of the architect as he labors to make mud beautiful at a square-foot price slightly under that of a diamond tiara.

Never has the problem been subject to such disagreement among architects, clients, and the public since the building of the Tower of Babel. No matter how the mud is finished, some devil is sure to comment, "It's good, but is it Art?"

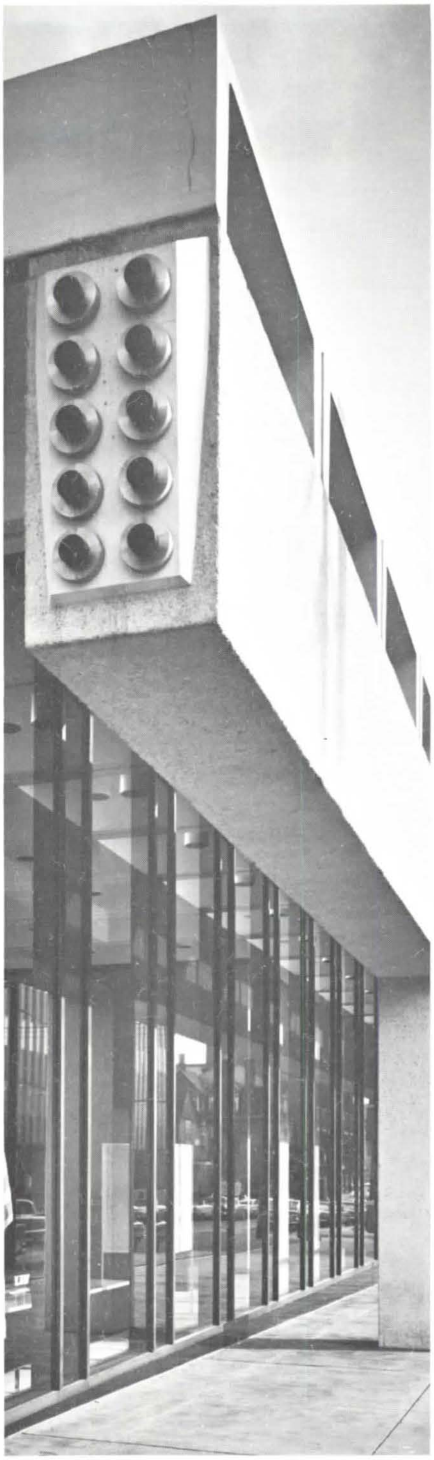
## Beauty Is Only Skin Deep

Why do architects expose concrete, and are they getting bored with boards?

Most architects agree on the beautiful complexion of concrete. "When we expose the concrete structural grid, our purpose, beyond economy, is a certain skeletal crispness that we have been able to achieve only with concrete," say architects Hausner & Mascai.

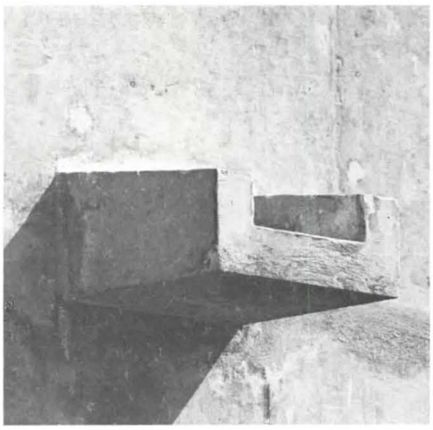
Frederick Frost comments, "I find that rough-board forms, when properly put together, produce what seems the most natural texture for cast-in-place concrete."

Chip Harkness of TAC notes, "We add a texture to a building in either the form of form boarding, or sandblasting to get a three-dimensional quality."



*Stressed delicacy.*

PITTSBURGH NATIONAL BANK, PITTSBURGH, PA. ARCHITECTS: SKIDMORE, OWINGS & MERRILL. PHOTO: MARIS, EZRA STOLLER ASSOCIATES.



*A taste for spouting off.*

PHOTO: GIL AMIAGA.

Ronald Gribbe reports that the use of exposed aggregate concrete is primarily a design decision based on aesthetic factors.

Summing up the predominant opinion, Earl Flansburgh enthusiastically remarks, "We have produced outside textures with boards, sand-blasting, bush-hammering, and form inserts, but this is only the beginning for this material."

Most architects agree, but not entirely. "I am good and tired of the exposed board impression and the form tie holes being considered as a great finish surface," says Jules Gregory of Lambertville, N. J., unconsciously speaking for the minority. "I studied under Perret, and loved his work of the 20's. But I think that a great deal of the current application is just plain sloppy."

## Beauty Itself Doth of Itself Persuade the Eyes of Man Without an Orator

Vociferous, shrewish argument concerning the beauty of exposed concrete by the public and client often obscures the quality of the architecture, and so endangers the future of concrete construction. Consequently, architects are understandably concerned over public and client acceptance, remembering well the fate of the metal curtain wall.

"We feel that there is a general slackening of client resistance to exposed concrete forms," is the hopeful comment of architect Howard Barnstone of Houston.

Flansburgh does not feel that acceptance is entirely dependent upon the client: "I think that the public will accept exposed concrete. The architect has to be willing to stick his neck out, even though there are a hell of a lot of concrete buildings that look absolutely miserable."

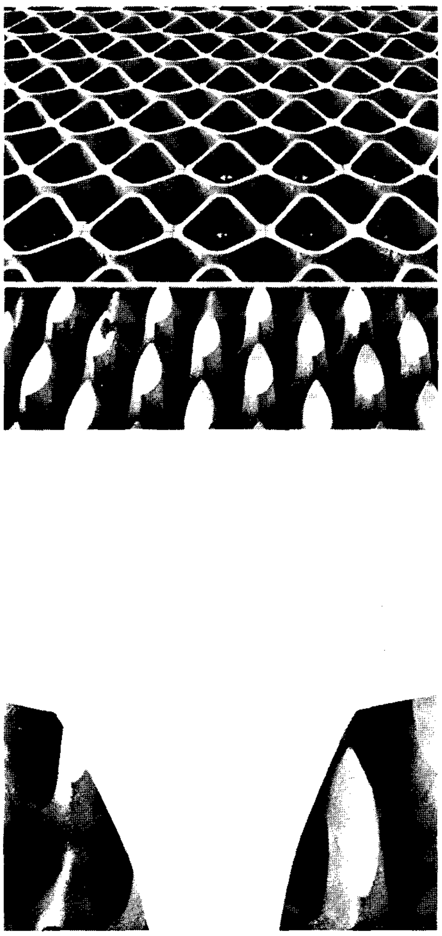
"Once a client is bitten by a bad concrete experience, he is twice shy," says Grad. "The public psychological climate is not geared to what comes out of the oven; they expect Yorkshire pudding. We are a cellophane-wrapped society; that is why Rudolph beats the hell out of concrete and why Saarinen wrapped the CBS in black granite."

"Concrete is mud," says Rudolph. "I work with concrete, not against it. I like mud."

Sumner Gruzen describes the continuing battle: "Even after we had conquered the sometimes mountainous opposition to

PHOTO: FORREST WILSON.

*Dripping expression.*



AMERICAN CEMENT BUILDING ARCHITECTS: DANIEL, MANN, JOHNSON & MENDENHALL.

*Flavor of precast patterns.*

the use of exposed concrete, we were faced with some tenants' insistence on painting the concrete to relieve the 'austerity.' We still seem to be in the basic stages of acceptance of concrete as a finished material."

Grad summed up the majority opinion: "The architect is not an individual until the society will tolerate him".

This, however, does not concern Rudolph. "I would like the public to like my concrete buildings, but I am not primarily concerned in pleasing them," he says. "The public usually waits for the critics to tell them what they like."

## Beauty Is in the Eye of the Beholder

Signs of age etched in city grime are often a disconcerting note in an era of eternal youth and this year's model building. Discussion of measures to counteract atmosphere stain elicits, for the most part, a "We can live with it" attitude.

"You cannot do anything to concrete to make it weather, because if you make a terrible mistake and the building falls down, that is a very serious thing for an architect, you know," points out Jean Paul Carlhian of Boston.

"Well, I think that buildings in a big city just get dirty," says Louis McMillan of TAC. "You have to accept the fact that buildings live in an environment," agrees Chip Harkness. Both men felt that the inevitable marks of age were not objectionable. "Have you seen the Place de la Concord after they sandblasted it? Shocking!" says McMillan.

However, many architects commented on the staining of I. M. Pei's plastic-formed concrete. A great number admired the casting precision obtained by this technique, but they found fault with the uncontrolled staining, which marred the articulation of certain elements.

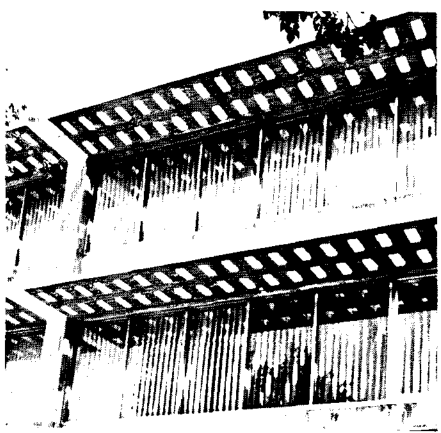
"You would never have that trouble with brick," commented Farch.

Sloping sills on concrete exteriors were criticized. "They just invite soot to lay on them, and the rain is going to streak the face," felt one architect who admitted that, when faced with a similar problem, he had evolved an equally unsatisfactory solution. He concluded, "We should get back to the old principle of having a drip and a cantilever."

"The public is not willing to accept new, dirty buildings," believes Grad, "although the New York Public Library was accepted for years before it was cleaned."

*Tilt ups fit to a T.*

*Chaste taste on a dairy window.*



CHICAGO CHILD CARE SOCIETY BUILDING.

ARCHITECTS: GEORGE & WILLIAM KECK.

*Refinement in shadow.*

To sum up, most designers agreed that we are in for an age of dirty concrete and that public taste will have to decide whether it is acceptable.

## Beauty Is That Medusa's Head

"Every once in a while, you look at a building that's been up for a while, and you get a disappointment that scares you away from using concrete. The darn buildings have a way of staying around for 40 to 50 years. You hesitate to let yourself in for that," was the fear voiced by Smith Haines, Lundberg & Waehler.

It is precisely this fear of the unknown that intimidated most architects, particularly those with large, established practices. Structural failures are, of course, fatal, but comparatively rare. It is the sight of a decaying concrete surface that makes the architect wish he were a Gorgon, whose fearful glance would turn the building to stone.

## Beauty Is Bought by Judgment in the Eye

The architectural decision that selects the appropriate exposed concrete surface is a tempering of beauty and an imperfection somewhat reminiscent of Ben Johnson's admonition to the young man on the virtues of ugly women.

"Shadows crossing the irregularities caused by honeycombing take care of imperfections," believes Dan Toan Frost elaborates: "One possible solution, especially on large-scale construction, is the use of forms like 'Q deck,' to give a pattern of light and shadow to dominate the surface imperfections."

There was a jam-and-biscuit relationship voiced by architects working in sculptured form. The fluidity of the material allowed them plastic expression, but engendered more imperfections than smooth-formed concrete. However, the very nature of the contrasting lights and shadow surface minimized the imperfections that it engendered.

Daniel, Mann, Johnson & Mendenhall, of Los Angeles, do not agree with rough surface concrete practitioners: "Much present use of exposed concrete, at least as seen in publications, tends to reflect the brutal school of design, which, in DMJM's opinion, will have a limited appeal."

Designing with smooth-surface concrete is also unsatisfactory to many: "Smooth forms seem imitative of stone or some other material, and also seem to create problems of surface cracking."

The accentuation of the seemingly inevitable cracks that appear in smooth surface forming was a major criticism of this forming method. "Crazing checked my craze for plastic forms," remarks a Southwestern architect.

## Beauty Is Truth, Truth Beauty, That Is All

Werner Seligmann, of Cortland, N. Y., feels that the subject of the foregoing discussion is immaterial: "The basis of any discussion about concrete is the dichotomy of the nature of concrete as a material, and the idea of American technology. Even at best, with the ultimate in control, it remains a *tour de force* to make concrete fit the idea of industrialization. It almost appears as if architects are feeling guilty for using concrete, and as a result are subjecting concrete construction to the ideas of industrialization to relieve their conscience. For anyone who has seriously thought about the nature of the material, this seems an absurdity. So why pretend? The reasons for the use of concrete are obviously psychological and formal."

# CAST-IN-PLACE VS. PRECAST

## Which Is Best?

Comparing precast and cast-in-place concrete is like comparing horses and cows. It essentially involves comparing two different beasts.

However, in the same way that oxen are used as draft animals, and horsemeat is sometimes included in hamburgers, the two methods of concrete construction are sometimes interchangeable.

## Quality Controlling

"Exposed cast-in-place concrete, unless strictly specified as architectural concrete and constantly supervised during casting, usually results in ordinary concrete, and is definitely not recommended if first-class surfaces are desired," comments Raymond Epstein.

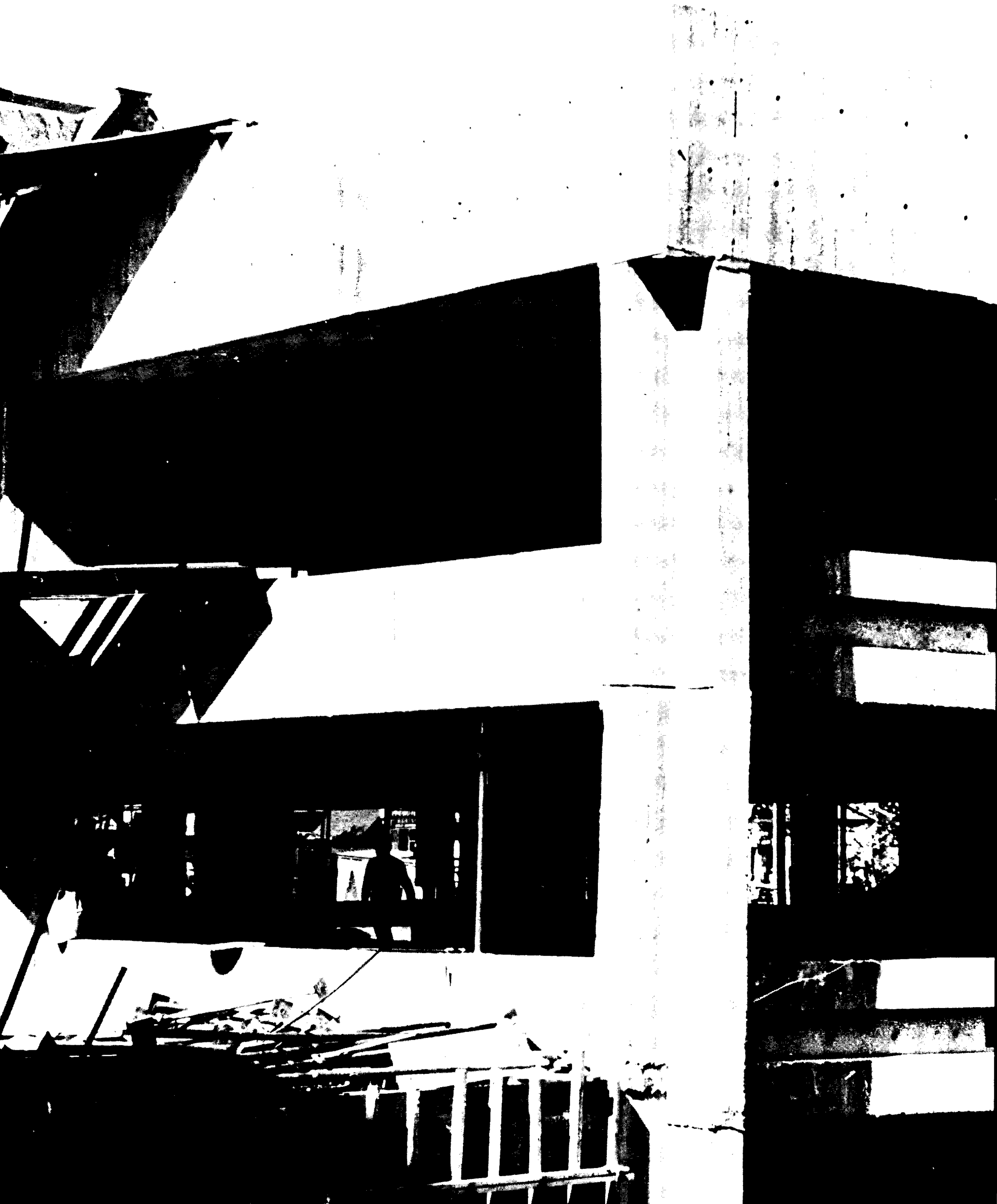
McDonald Beckett, in typical Western understatement, says, "Cast-in-place concrete requires subtleties that we do not fully anticipate."

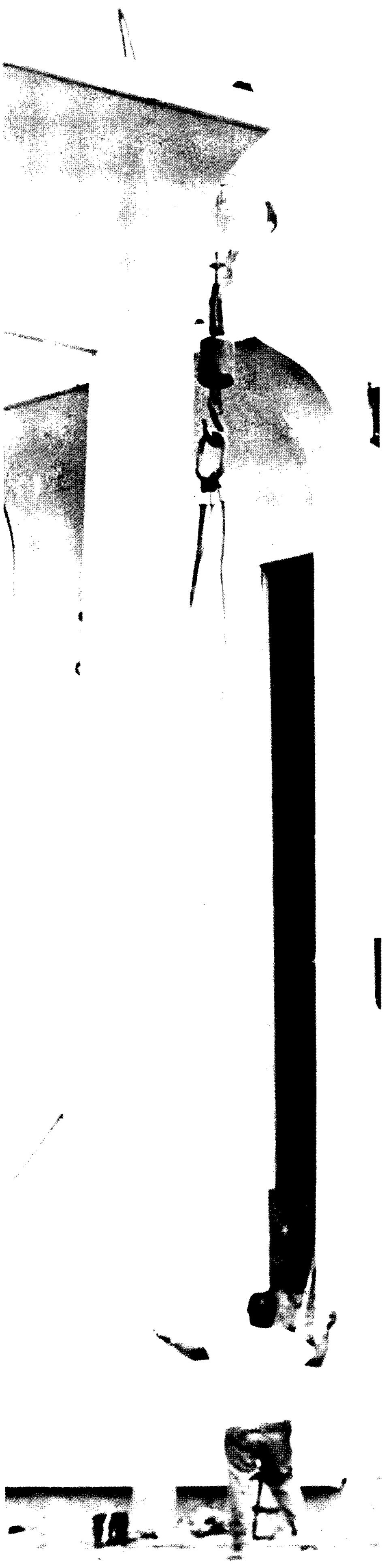
The lament was almost universal over the inability to control cast-in-place in comparison to the regulation possible with precast concrete. But the same enthusiasm does not extend to precast when dealing with the problems of fabrication, delivery coordination, and the multitude of indeterminate factors encountered on a construction job.

Architect Leo Kornblath maintains, "The control and technological advances in the precasting industry are heartening. However, with the greater use of precast concrete, the manufacturers do not keep pace with the needs and desires of the industry. As a result, cost is increasing with rising production instead of decreasing."

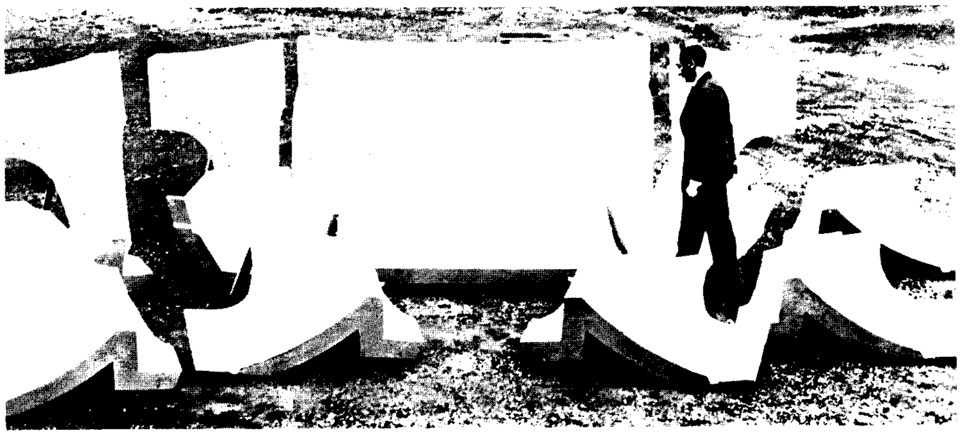
Kornblath also notes that it is difficult to control the general contractor's selection of subcontractors: "The general contractor will frequently revert to fly-by-

*"Cast-in-place requires subtleties that we do not fully anticipate."*



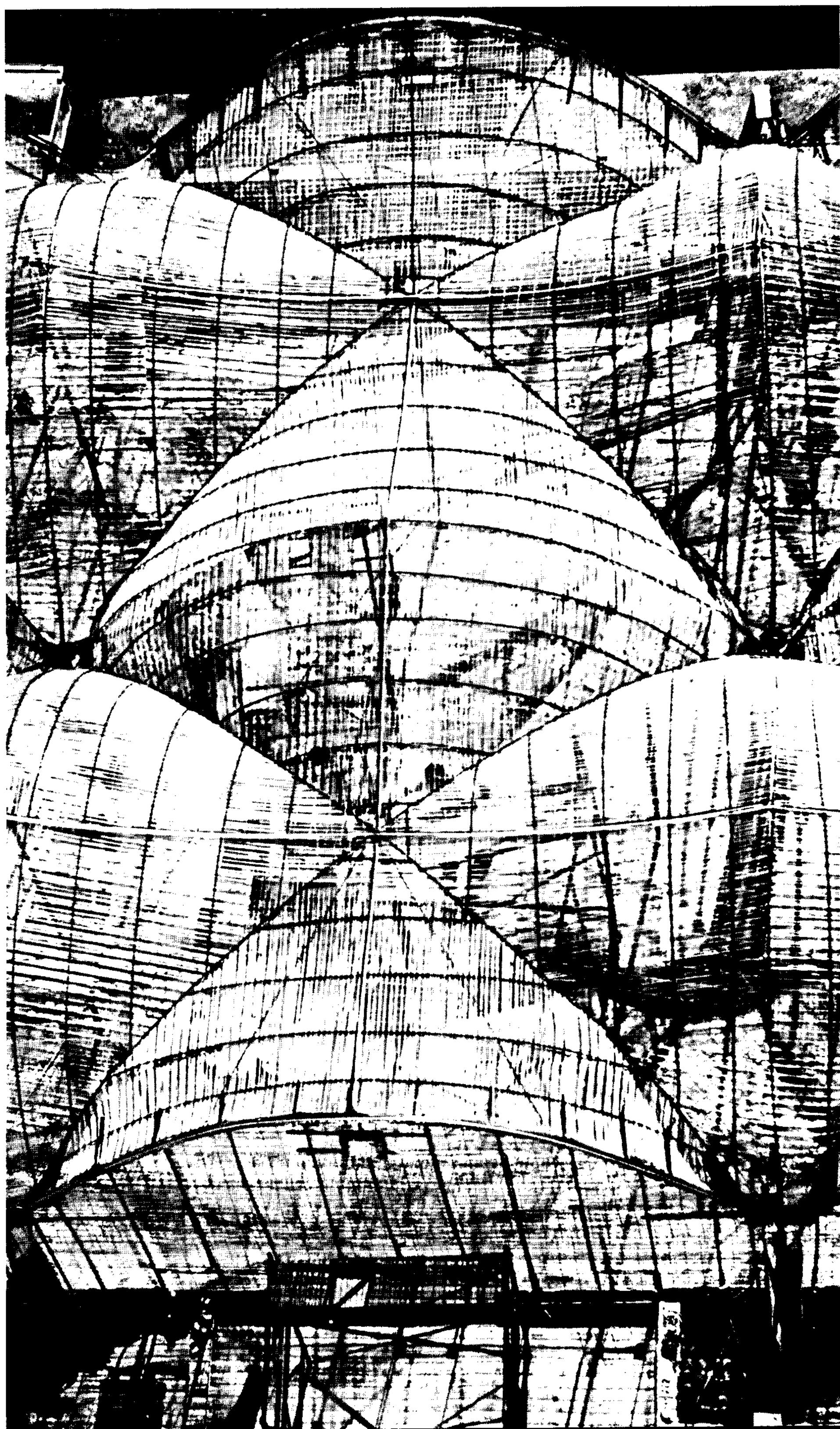


NEW JERSEY BELL TELEPHONE COMPANY BUILDING. ARCHITECTS: FRANK GRAD & SONS. PHOTO: COURTESY, WINNER MFG. CO



*Column and cornice, left, are precast in glass-fiber molds shown disassembled, above.*

*Concrete applied pneumatically to metal lath welded to reinforcing, needs no forms.*



ARCHITECT: MORRIS LAPIDUS PHOTO: COURTESY, VIN-LOX CORP night manufacturers to effect savings. On many occasions, we have had to revise our design and details to meet shop limitations."

Richard Roth, Jr., of Emery Roth & Sons, feels that "precast concrete is still a craftsman-like profession, and therefore all pieces are practically hand-made." He cites the case of the Pan Am and the Bankers Trust Buildings in New York City: "We *have had* the experience on large jobs of having the precast concrete manufacturers going bankrupt on us, because they have neither a large enough plant nor the financial ability."

Clifford Stewart comments, "Precast concrete has the same disadvantages of the old cast stone of the 20's and 30's. There is no reason to suppose a change in name will correct the defects. Luck and workmanship will still play a part."

Vincent Kling finds that "the one advantage observed within the past six years is the increased knowledge of the tradesman."

Edwin Steffian notes that there are excellent precasting plants in the Boston area, which he uses whenever he can. "Once the impression left by 'cast stone' is eliminated, there will be great advances in the acceptance of precasting."

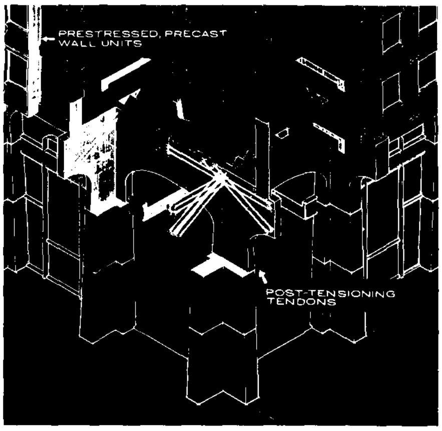
"Cast-in-place concrete is not as limited in the competitive market as precast, because the field of cast-in place is not limited to so-called specializing shops," says Harry King, of King & Lewis. "I see the cast-in-place field progressing faster because of more courageous use of exposed cast-in-place concrete by architects."

Gruzen states the case bluntly: "The precast industry has become so busy that their estimates have not been reliable at bidding time. The architect would be wise to have beams, fascias, panels, etc., designed as a cast-in-place alternative to force effective competition."

## The High Cost of Precasting

"Limestone is the poor man's concrete," remarks Dan Toan. "We find the cost of precast concrete work to be often exorbitant—usually being bid much higher than estimated by the manufacturers during design. For this reason, we have recently changed two projects from precast to limestone."

"We find limestone to be often less expensive," says Louis DeMoll of Ballinger




*Combined stressing techniques enable contractor to stack prestressed, precast. . . .*

PALO ALTO OFFICE CENTER, PALO ALTO, CALIF. ARCHITECT: TALLIE B. MAULE. PHOTO: HANK KRANZLER

*. . . concrete panels, and post-tension cast-in-place framework at 15-story building.*

Co., architects and engineers, Philadelphia.

A Southwestern architect states that precast panels rose from $5 to $10 per square foot during bidding: "Architect says cast-in-place, engineer says not possible, but the job is out to bid anyway."

Wallace K. Harrison states unequivocally: "Everytime we have had comparative bids, the cast-in-place comes in cheaper."

Gyo Obata reports that, around St. Louis, casting and sand-blasting concrete on site is considerably less expensive than precast.

"Precast concrete is still a difficult and expensive medium," notes Roth. "And until we find a better way to manufacture and hang it on a building, I see it only as a prestige material for expensive high-rise structures. It will be easier to bring down the cost of cast-in-place than the cost of precast concrete."

"Solutions are worked out in either cast-in-place or precast concrete, leaving the option to the successful contractor and his personal practice," believes Walter Netsch, Jr. "We have discovered that precast concrete begins to move into the higher-cost limestone and granite prices, sometimes exceeding them, and this makes cast-in-place economically justifiable."

## Weakness in the Joints

"Loadbearing precasting works fine on five or six floors, but on twenty it will not work," points out a contractor.

"If one devises a structure so that precast elements can give structural stability without having to make rigid connections, the economics of precast construction have an advantage," add Markus & Nocka of Boston.

This method has disadvantages, according to Philip Meathe of Meathe, Kessler & Associates, Grosse Point, Mich.: "With all the welding plates and attachment brackets needed on a precast job, there's usually an opportunity for expansion and contraction cracks in floors and walls."

Carlhian also does not think much of this method: "With precast beams and precast columns, there is always the problem of a junction point that has to be cast-in-place. If it is not cast-in-place, it becomes a watchmaking type of construction that is identical with steel. So why not use steel?"

Hedley Roy points out that it is not possible to use precast concrete alone for high-rise buildings, since lateral stability becomes critical: "This lack of stability, which makes a major problem of joints, rules out high-rise precast structures for most architects and engineers. However, there are methods of overcoming these difficulties."

"Don't you think that cast-in-place concrete should depend upon what you want to express?" is the question posed by architects Gill & Heespelink of Boston. "We think it would be terrible to govern architecture by precast or cast-in-place. We should be free to use either one. We recently solved the problem of joints in a precast building 32 stories high. The jointing problem would never have existed if engineers thought about the precast system instead of adopting it from steel handbooks. We get rigid-frame action from post-tensioning."

"Using inert forces," they continue, "the material dictates to us what we must do with it. But we should assert our control and dictate to the material what it should do. Cast-in-place is still the passive method. By introducing active forces with post-tensioning, you create positive forces you can control."

In contrast, an architect feels, "There is really more than enough to do with cast-in-place concrete without playing around with all of those fittings and junk."

The decision to use precast or cast-in-place is, of course, dependent on the nature of the design. "The advantages of both methods seem to await further technological improvement to make them fully interchangeable," concludes Farch, "not like brick, which you can use for anything. That's a horse of a different color."

# SEARCHING FOR THE ULTIMATE PLASTICITY

## What Will Be Done

When architects try to describe a material to replace concrete, they usually envision a plastic material that hopefully solves the faults of concrete. They do not, however, offer a true plastic as an alternative to concrete.

A few, however, advocate using steel. The type they recommend would be in fireproof sheets, and possess the characteristics of plasticity so much admired in concrete.

The concepts embodied in concrete as a material changed the context of architecture for most architects.

"The importance of the leadership assumed by architects in the use of concrete," points out Charney, "is not so much shoving the bloody material out front and exposing it, but in the context of building, which has changed so drastically in the past six years. In large-scale buildings, the problems can only be solved by materials that are of the nature of concrete.

"One can turn the whole question around and say that it's architecture not designed for, but designed by, concrete solutions," continues Charney. "And, to me, the real leadership provided by the profession has been in relating concrete to problems that are entirely new, and then coming up with new solutions that can only be solved by this material."

## It Isn't Wine Either

Some architects saw concrete improving by itself. Leo Kornblath says, "With admixtures and retardants, it is possible to achieve aesthetic effects unknown before. The continued rise in research in the use of concrete form work, integral color, chemical admixtures and retardants will result in a greater use of this material."

A Boston architect prefers steel: "If we can develop integral fireproofing for steel, you will see what happens to concrete. Steel is the material of the 20th Century. It is a completely man-made thing, invented by man and produced in Pittsburgh —a fabulous material. When Cor-Ten is covered with soot, it is beautiful. It is like wine or leather, it ages well; it is like pearls on your mistress's skin that assumes a beautiful patina. This is not true of concrete."

"The future of concrete," says Frank Grad, "is tied up with the future of the entire construction industry for the next 25 years. It will follow the same pattern. The fact that a skilled mechanic will receive $10 an hour may mean that big business will come into the manufacture of basic building products.

"When the space race is over," he continues, "and those men return to industry, and industry enters the building field, the cosmeticians of architecture will have to get off their butts."

## I Like It, But...

Architects are intrigued by the possible use of plastics. "I think that we will have the best concrete when we do not use cement at all," argues Dr. Komendant. He hopes for the development of an epoxy that will bind the mix together without plastic flow. The resultant mix will set in two hours and resemble granite.

Safdie sums up the feelings of architects who look toward plastic: "Concrete is heavy; it has limited value in terms of weathering. It is like brick: It absorbs moisture and is no good in tension. But I think eventually we will develop plastics that have fire resistance, that are lighter, that have tensile and compressive strength. These materials will tend to replace concrete in 30 to 40 years."

However, Safdie and many other architects believe that concrete is the only material available right now that can be used structurally as a surface material to enclose space.

"Today, in concrete, we have the Hat School and the Snorkel School and many others," comments Grad. But he adds, "Out of this will come new direction, new expression, making it easier to sell new ideas."

"Concrete is a great structural material," says Farch. "Bury it."

# CURTAIN WALLS: MORTIFIED OR JUSTIFIED?

*What developments have been made in precast concrete curtain wall construction during the past six years?*

An improvement in connections appears to be the most frequently observed development, and improving connections is a continuing process that could be usefully discussed again in another six years.

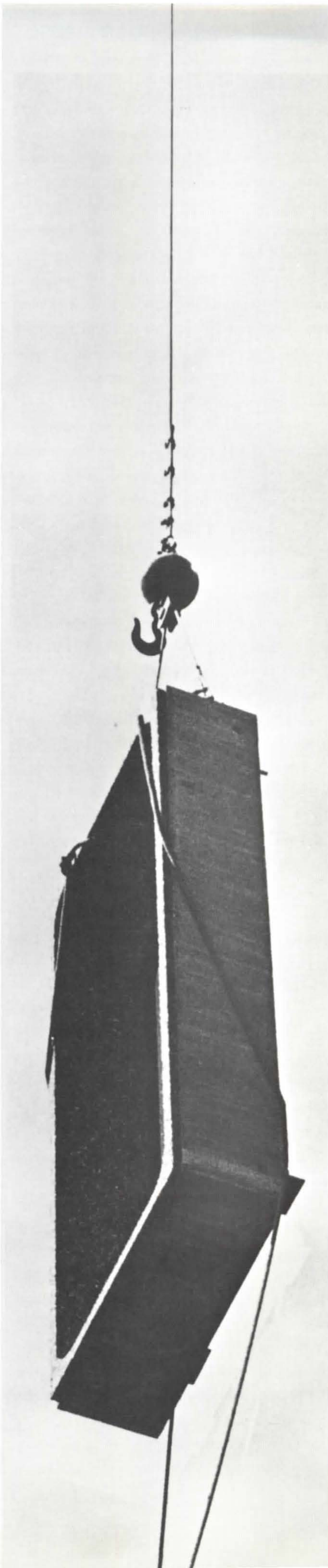
Connections between panels, and between panels and structural frames, both get the nod. Connections are simplified, and to a small extent have been standardized by precasting plants. One engineer notices connections are using less steel than before. There are more concrete-to-concrete connections, instead of between steel plates embedded in the panels.

Lev Zetlin, a New York City consulting engineer, comments that precast curtain wall has developed slowly because it has been connected in a manner similar to metal curtain walls: "These are two different products, and their connections should be adapted to the inherent properties of each material."

Paradoxically, concrete curtain walls are praised for having been developed into loadbearing components. Despite the contradiction in terms, when curtain walls carry floor loads or transmit horizontal forces, they become, in the eyes of many architects, better walls. Many believe such walls to be more competitive in cost, and eventually they will supersede curtain walls.

Meanwhile, curtain walls have gained favor, due to progress in insulating techniques. In Texas and New York, however, two firms note a decline or abandonment of sandwich panels. Caudill, Rowlett & Scott says it braces two sandwich panels together with ties, which achieves a trussed effect, enabling the panels to be structurally efficient for horizontal loads.

Erection techniques have kept pace with the development of large panels. The European tower and climbing cranes significantly influenced the spread of precast walls across the U. S. These handling techniques permit contractors to install concrete wall sections without much more difficulty than metal sections.



PHILLIPS PETROLEUM BUILDING. ARCHITECTS: WELTON BECKET ASSOCIATES.

The weight of precast concrete is often cited as a factor against its use, but Vincent Kling found it to be much lighter than granite, so he faced precast concrete panels with thin slabs of granite. If solid granite had been used alone, points out Kling, the wall would have been *feet* thicker than a composite panel of structural concrete and surface granite.

Among other developments: improved concrete, especially precast on vibrating tables, neoprene gaskets that dispense with window frames, new form liners, improved chemicals for exposed aggregate work, and greater dimensional accuracy, resulting in constant joint widths.

Lastly, one architect replied tartly to the question of developments: "Too much development and too much use."

*What is the purpose of using concrete curtain walls: Aesthetics, or costs?*

"Concrete curtain walls are justifiable only on the basis of appearance. This type of construction is almost invariably more expensive than the alternatives," said a Canadian architect who could easily have been appointed as spokesman for the majority of respondents. Another architect put it wryly: "Costs are anywhere from expensive to extremely expensive, depending on the finish and aggregate."

A voice of dissent: "For walls of comparable quality, precast concrete is cheaper than metal."

A voice of reason: "Concrete costs more, but in time it may be cheaper than metal, because of maintenance costs."

Chorus: "Architects like the concrete curtain wall because of the plasticity of the material."

The homogeneity of the material appeals to designers who want complex cross-sections without welds or mechanical fasteners: "Concrete is really like sculptor's clay in an architect's hands."

"In one hand" would be more apt, for the architect needs the other hand to balance costs with aesthetic judgments. "Concrete curtain wall is the result of an aesthetic consideration in lieu of a cost consideration." . . . "It looks more permanent, but costs more than metal; thus aesthetic governs."

To keep costs in line and still produce a pleasing concrete wall, A. Epstein & Sons, Inc., forms ribs or vertical grooves in the panels. This adds texture to the panel and masks the vertical joints. It adds to the cost slightly, but is "twice as rewarding architecturally."

Concrete also gets a higher fire rating than competitive walls, and can provide both exterior and interior finish with one unit. With larger units, there are fewer joints to calk—and leak. Concrete panels do not have to warp, even though many people believe they invariably do. One engineer feels that poor joints between undeformed panels give the illusion of warped panels.

They do break, though, and one architect says breakage and delayed delivery has left him reluctant to try the material again.

*What do's and don'ts would you offer in precast concrete curtain wall construction?*

Whatever you do, do it big—at least with curtain wall panels. Size reduces joints; some architects avoid joints like small boys avoid soap.

Once committed to precast panels, say many voices, watch out for warpage. To prevent it: check the precasting yard before awarding a contract; insist on proper curing, handling, and stacking procedures; detail sufficient thickness of concrete and enough reinforcing; prestress thin members; check that panels are properly sealed or waterproofed before delivery.

If concrete does not warp through shrinkage, it may move with thermal changes. Avoid by detailing for thermal movement, particularly with windows that can be cracked when surrounding materials expand.

This advice is particularly relevant with panels that do not have metal window frames. "One of our single-story buildings moves at the top, but not at the cooler bottom," points out an architect. "The wracking breaks glass in windows glazed directly to the concrete." But do consider preglazing to reduce site labor time.

If concrete panels are to be insulated, do not insert insulation inside the concrete unless one of the layers of the sandwich is allowed to "slip" with temperature changes. Also, with this sandwich construction, remember to insulate the joints between panels.

Joints between concrete panels should not be less than ½ in., so they can take up some dimensional variations of precast units. Understand the dimensional tolerances, caution several men; and do not work with too close tolerances, say others.

"Do not expect large expanses of concrete panels to butt exactly, and have uniform color and texture," cautions Morris Lapidus. To avoid this, break up panel surfaces, but give thought to the finishes.

Concrete cannot compete with polished materials such as granite, says a firm from New England. Roughen it, choruses the rest of the country. But not too rough: "Avoid highly textured surfaces where dirt accumulation is objectionable."

"Don't coat concrete with emulsions or silicones if the concrete is anywhere near greasy exhaust gases from domestic incinerators or oil-burning furnaces. The coatings hold the greasy dirt, which can be cleaned only with sand-blasting."

Stains from weathering can be reduced by proper detailing. Drip molds are frequently omitted, and the results cry out for climbing ivy. Make provision for carrying down rainwater to minimize streaking.

Do not detail too many projections, because it increases the difficulty, and price, of precasting. Do avoid expansive aggregates that expand when exposed to weather, and do not detail welded anchor plates where the welding can crystallize exposed aggregate.

*What structural benefits derive from precast curtain walls? How can they be improved?*

Answers to this overlap replies to the question about developments in the last six years. Curtain walls are beginning to fade out of some designers' vision, and will be replaced by loadbearing walls.

Listen to these engineers:

"With proper joint details, they can be used as precast shear walls."

"In seismic areas, curtain walls can be made to provide stiffness and shear resistance against lateral deflection."

Alternatively: "They can be used for lateral stiffening, but this can be achieved more economically with other means."

And, "It's not desirable to use exterior panels as loadbearing elements because of the field-erection cost ratio between structure and architectural panels."

Another engineer foresees post-tensioned panels strung together to make long-span spandrels. Several point out the added weight on a structural frame caused by precast panels not contributing to the structure. And one architect maintains that panels can add 1½ lb of steel per sq ft of building—an enormous cost for a large building.

*What are the special detailing problems?*

Detailing precast concrete seems to be no more difficult than any other construction material: provide sufficient clearance between different materials; don't try to make it too sophisticated; and devote time to research.

• **Waterproofing:** Sometimes found to be a hidden expense that blooms late and large in precast concrete work. The Portland Cement Association claims, like a temperance society, that architects would rather not have joints. Elastomeric sealants seem to be everyone's idea of solving the problem of leaking joints. Mortared joints are nobody's idea of a good detail.

Panels should be attached to the structure at frequent intervals, and horizontal joints calked with a waterproof, flexible compound to prevent build-up of stress through plastic flow, moisture or thermal expansion, or through transference of load.

Before sealing, the concrete surfaces have to be smooth, true, and free of contaminants. To insure a good bond between sealant and concrete, many architects specify a primer to make the concrete surface compatible with the sealant.

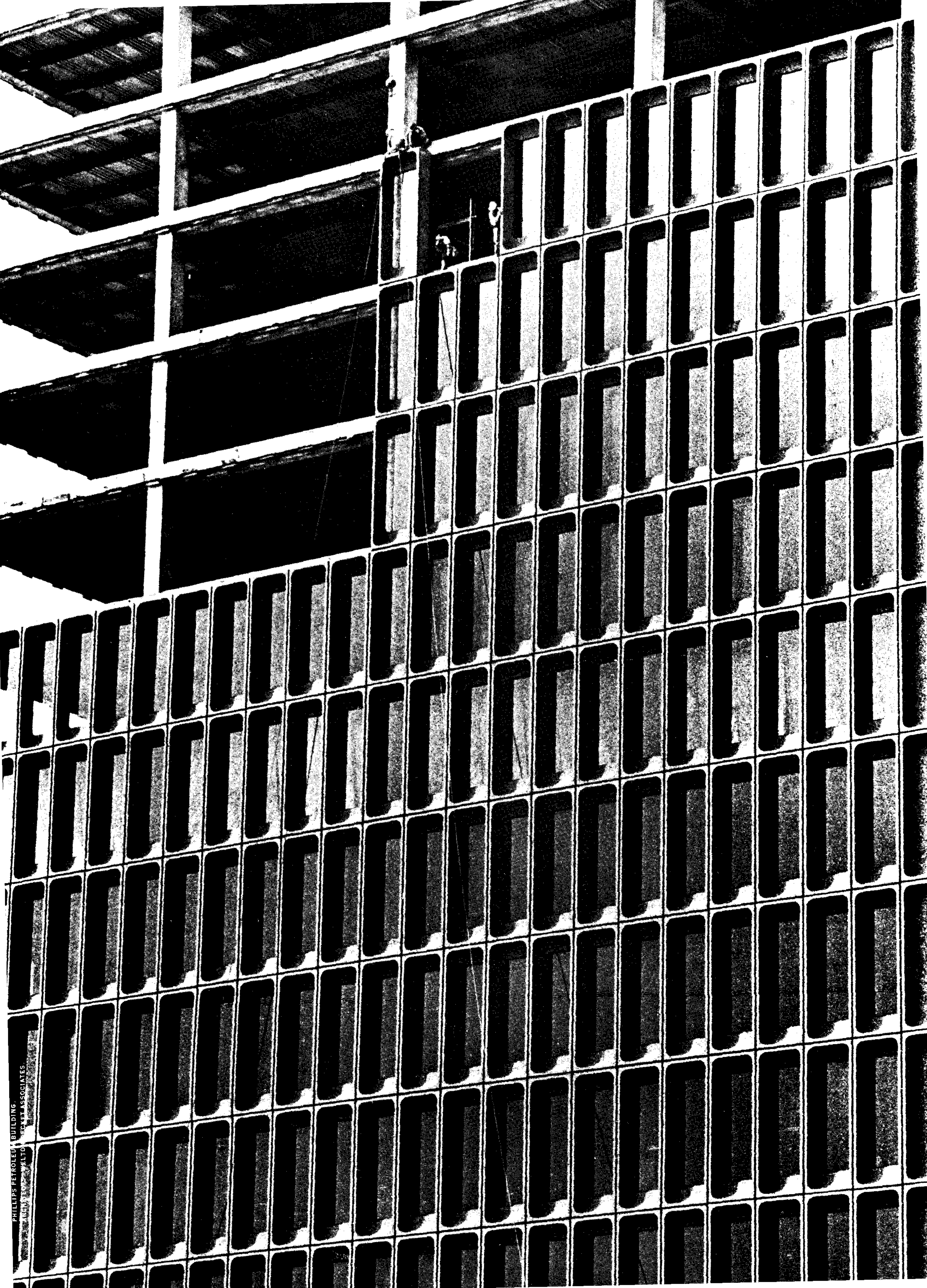
Among the general do's and dont's of sealants, this perhaps little-known news: Form release agents must be compatible with joint sealing materials.

• **Sash:** Avoid stressing concrete around window frames. Compression at the edge of a panel will spall the concrete. A 1-in. clearance around the frame, filled with sealant, will avoid trouble. Many advise against frames in favor of gaskets. One firm prefers not to use precast walls with operating sash.

Successful neoprene gasket installations require attention to details, particularly insuring that reglets are completely covered with the gaskets.

• **Corner panels:** For aesthetic reasons, many firms do away with corner posts and abut window glass with a thin plastic molding. This still requires a special concrete unit, as does a corner unit L-shaped in plan.

Special units raise costs. Since there



PHILLIPS PETROLEU BUILDING.
ELTO ECKET ASSOCIATES.

Mock-up of Pan Am curtain wall.

are usually only four corners, there is no call for repetition. Butting two regular panels at the corner is the economical solution. But an engineer cautions that there is greater wind suction at the corners of a building.

*What do you predict for the future of precast concrete curtain walls?*

Some prophets see a cloudy crystal ball. Life for the precast curtain wall will be over at forty. Or before.

Two men quote Paul Rudolph's remark about the rise and fall of a curtain wall, and apply it to concrete. The vogue, the fad, the cliché will fade. "It's being used to death. It will be considered trite by the public."

Two interesting views on money: "There will be a decreasing trend to precast walls because of an increased tendency to reduce construction costs."

And, "Average architects will switch to precast walls from metal curtain walls, and great fortunes will be made in precast curtain walls."

Before this happens, however, architects see hope for an increase in quality and quantity that can benefit the building industry. Some also believe that the road to successful concrete walls is through cast-in-place construction.

If not, precast assemblies must include mechanical and electrical components, interior finishes, vapor barriers, and eventually be attached to a structure with fast-setting compounds that do away with nuts and bolts.

This is how architects see the future. In addition, one suggested lightweight concrete panels that meet fire regulations. Well, P/A had asked some engineers about lightweight concrete panels, and, in aggregate, they gave it thumbs up.

They like it because it cuts down on dead load, insulates better, retards fire better, and has lower thermal expansion coefficients. However, lightweight aggregate wins no prizes for color or appearance, and cannot be used for exposed aggregate panels.

Lightweight concrete can be durable if cast properly. Do not make the panels too thin, do use air entraining, lower the water content, cure properly, specify durable aggregates, and, where feasible, prestress the panels.

One consultant raised the topic of commercial lightweight units with aluminum additives. He believes there is a great potential if manufactured properly, and if erected by trades other than the concrete subcontractor.

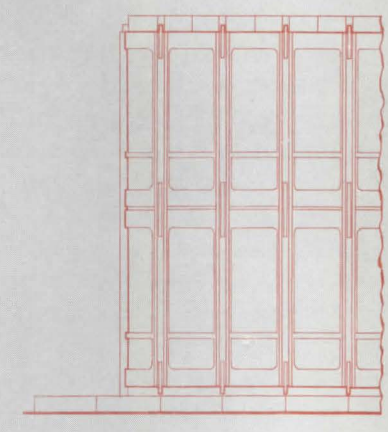
*What, in the opinion of engineers, is the best way to connect panels to a structural frame?*

Engineers, like doctors, sometimes disagree on a diagnosis. All, however, want a lot of tolerance to move the panels around. Connecting them is a varied story.

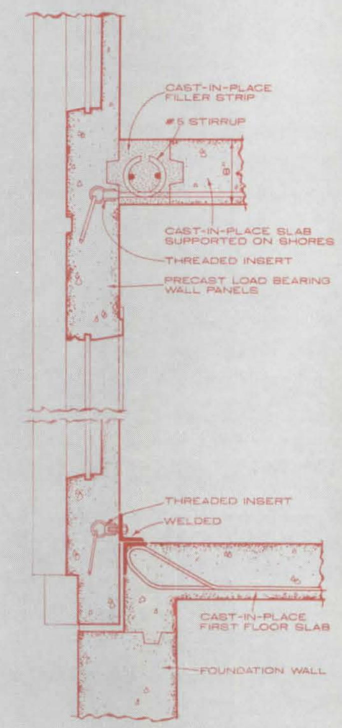
"Concrete directly bearing on concrete lugs is best." . . . "Positive bearing surfaces such as seats." . . . "Panels should rest on a concrete frame so that vertical support is directly on the structure. Galvanized bolts and angles make secondary attachment." . . . "Integral lugs bearing on the frame."

"The best way is to embed steel inserts in panels and frame, and weld the two steel plates together." . . . "Threaded studs screwed through a steel clip attached to the panel and into a steel plate on the building frame." . . . "Bolt through a plate on the frame and into an anchor cast into the panel."

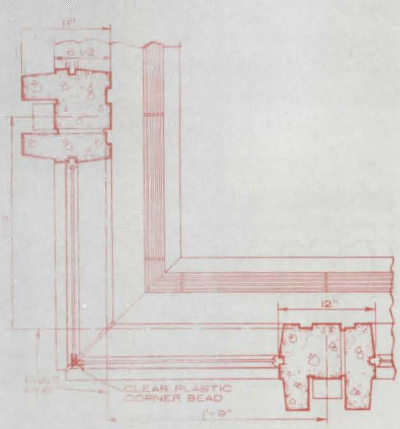
**On this note of earnest advice ends the group discussion, in which the experts, in tones ranging from harangue to despair, have argued the merits of concrete—hopefully to the enlightenment of all.**



ELEVATION




SECTION




PLAN AT CORNER

*Slab connection solves problem of coordination between precast loadbearing walls and cast-in-place slab. National Opinion Research Center Building, University of Chicago. Architects: Hausner & Macsai.*

# FROM PRECAST CONCRETE TO INTEGRAL ARCHITECTURE

An architect discusses the progression in his work from concrete curtain wall, to loadbearing wall, to architecture integrated with structure and mechanical systems.

*By Aldo Cossutta, a partner of I. M. Pei & Partners, New York City.*

It is hard to believe, in the rush of architectural events, that only 10 years ago the Denver Hilton hotel emerged from the drawing boards. When completed in 1960, it represented the first fully consistent use of concrete in the U.S.: a precast skin enclosing a concrete structure.

The hotel signaled new possibilities of architectural expression for a technique thoroughly neglected in this country. Exposed concrete construction had previously been relegated to applications of a more utilitarian nature.

In the 1950's, the then-current architecture was steel, glass, and aluminum. The mood of the architectural avant-garde was one of excitement and exhilaration over recent achievements.

One by one, the landmarks of the early 50's, such as Chicago's 860 Lake Shore Drive, the Lever House, and Pei's Mile High Center, became reality, with tangible proof that the long and persistent pioneering efforts had finally borne fruit. At last they could be seen, touched, and tested out.

Why, then, at a time when the new expression and modern technology had barely met, was it necessary to depart in such a different direction with the Denver Hilton?

## Self-Propagating Building

Three coincidental circumstances led to changing from the currently popular steel frame to concrete. The first one, somewhat negative, relates to shortages, delays in deliveries, and rising costs of structural steel during the Korean War. It thus became coldly logical from the outset to build the frame in reinforced concrete. But this decision raised questions such as: Would a metal and glass skin complement the strength of a concrete frame, or deceive it? Was not the juxtaposition of the two an inherent contradiction?

The second circumstance was a happy discovery. Despite the third-rank treatment of concrete as an architectural material, scattered around the country were a number of casting yards with a residue of solid craftsmanship awaiting to be tapped. Traveling in search of evidence, I found interesting examples of work, including the Baha'i Temple in Evanston, Ill., a curious, early work of ornamental precasting; and the more recent Mormon Temple in Los Angeles.

Although very remote from the problems of the Denver Hilton, these examples offered proof that architectural precasting could be done, even in this country, and that the material would withstand the test of time. In keeping with this tradition, Otto Buehner's casting yard in the Mormon capital, Salt Lake City, accepted the challenge, and was selected to do the work. Looking back, it is clear that, without Buehner's experience, we could not have achieved the quality of the Denver Hilton.

The third circumstance, and the most important, was the vision of the building itself. The mile-high altitude of Denver, the extraordinary transparency of the air, the capacity of the sun to brilliantly delineate light from shadow and transform its tracery into architecture—those were the uinque attributes of the environment.

To respond to this meant using a material capable of taking possession of shadows rather than diluting them by reflection, and also a material that could be worked in depth. In my mind, the building already took the form of a giant beehive of carved-out niches, counterpointed by single planes, precise in shape, and repetitious in character.

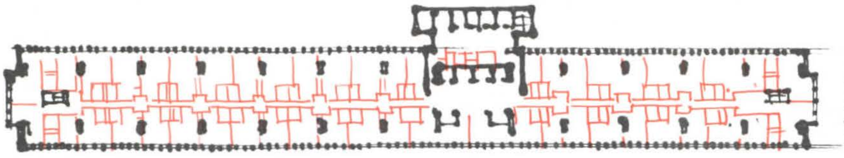
So we cast the Hilton frame in place, and hung precast wall units from the edges of cantilevered flat slabs. These façade units were cast with sand and gravel screened out from soil excavated from the site. After casting the units, workmen lightly etched them with acid to expose the color of the stone. Thus, unobtrusively clad in its brownish-red tint, the Denver Hilton literally grew from its own soil.

## Maintaining Unity

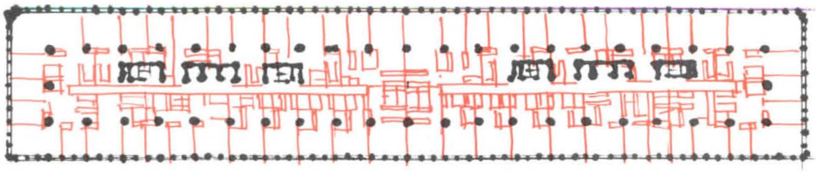
While we were designing the building in

*"A curious early work of ornamental precasting."*

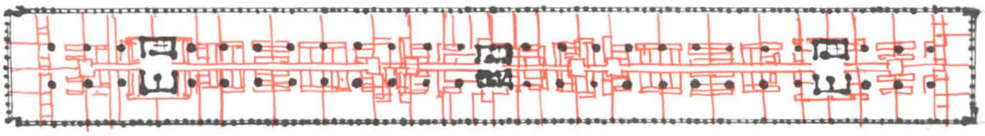
NATIONAL BAHA'I HEADQUARTERS, EVANSTON, ILL.



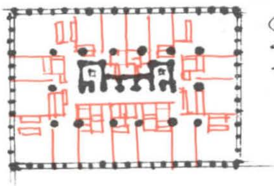
Denver Hilton, Denver
22 floors
2'-11" module, 29'-3" bay



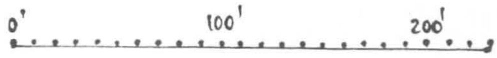
Kips Bay Plaza, New York
20 floors
5'-9" module, 17'-3 bay

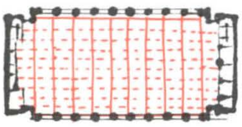


Hyde Park, Chicago
10 floors
4'-1" module, 16'-4" bay

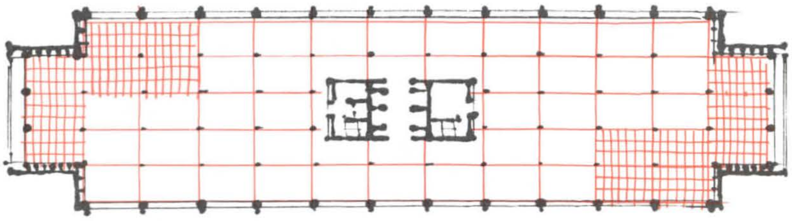


Society Hill, Philadelphia
30 floors
5'-10 module

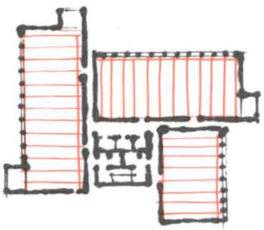


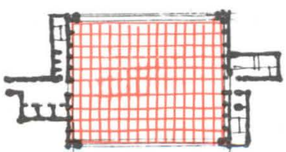
Earth Sciences Building
Cambridge
9'-0" module



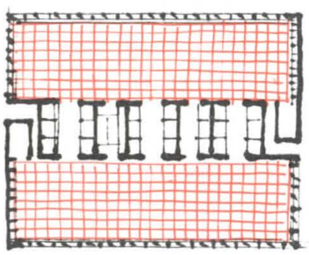
L'Enfant Plaza
Washington
3'-1" x 6'-2" module
27'-9" bay



Bushnell Plaza
Apartments, Hartford
5'-10" module

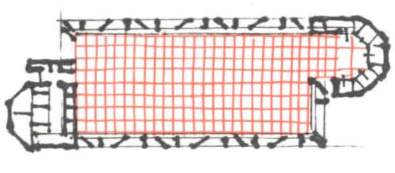


American Life Insurance
Building, Wilmington
4'-6" x 6'-0" module



Eaton Centre
Office Building
Vancouver
3'-8" x 3'-8" module

*Plans indicate design development from the rigid approach based on conventional steel-framed structures to the simpler interiors of concrete loadbearing walls, and, later, fully integrated structures. The simpler layouts tend to produce a stronger architectural form.*



Christian Science
Church Center
Boston
4'-7½" x 6'-2" module

ALL SKETCHES IN THIS ARTICLE WERE MADE BY THE AUTHOR.

'56 and '57, the material and the technique underwent a process of self-definition. I was curious to penetrate the inner logic of its existence in order to extract the architectural potential of its application.

Within the limitations of molding techniques, a new freedom could be perceived. Shapes and form hitherto unattainable could actually be produced economically if the repetition were large enough. Limitations on sizes and proportions usually found in standard building materials automatically disappeared.

The precision that could be built into the precast concrete elements equaled that of ornamental metal. Components of considerable size could not only be manufactured, but, with the huge cranes available, could also be installed.

The material at hand, however, with its strikingly new scale, also posed new problems: How to fuse these thousands of separate units into an architectural unity, how to make an insoluble assemblage instead of a mere collection of parts. The answers were not readily available.

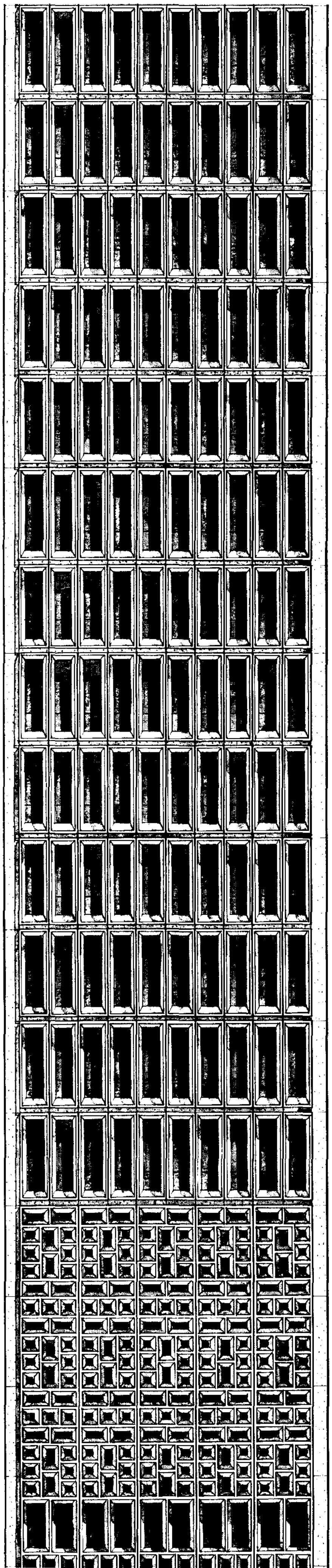
The joints in themselves were of no help. On the contrary, the joints of the story-high by 6-ft wide façade elements formed vertical and horizontal incisions that contributed to the fragmentation of the façade. The best that could be said was they were necessary, but that was not good enough.

So I designed into the surface a grid with a pattern of deep reveals: a tracery of shadow lines engendering all the joints and relegating them to a lesser role. Instead of submitting to a necessity, the design became a positive tool of architecture. Paradoxically, by this device the surface was effectively established and the illusion of a carved monolith accomplished.

But it was a device. It pointedly revealed the inherent characteristics and dilemmas of precast concrete, be it structural or not. At best, it is a material that must be produced in large components. When spanning large areas, the components become so large that their individuality continues a life of its own at the expense of the architectural whole.

Alternatively, attempts to harness the components' independence lead to a *tour de force* of one kind or another, a sure portent of a tenuously maintained equilibrium and lack of inner harmony. The ensuing aesthetic is in both cases imbued with an implacable thrust of its own.

DENVER HILTON HOTEL



## Skin and Structure

There were also other questions of conscience. For example, the strength of the structural concrete was 4000 psi. But in contradiction to this, the strength of the precast concrete skin was, for reasons of precasting, at least double the strength. It almost looked as if the skin could, and should, carry all the loads.

However, a precast structure is like a house of cards. Continuity, resistance, and lateral stability are only achieved with great effort and expense. Welding, grouting, or post-tensioning the joints may be reasonable techniques for assembling low buildings. But in tall, slender structures, where the magnitude of lateral stresses and the ability to lift components become overwhelming considerations, the joinery of loadbearing and long-span units becomes a self-defeating undertaking. It can be solved, but, like all contraptions, it runs against the grain of the problem. We tried several times and failed to prove this point convincingly.

But the main lesson I learned on the exciting Denver journey was simply this: A skin always remains a skin, even when it is made of precast concrete. Whatever its virtues may be, it can never assume the natural primacy of the structure. Structure is obvious, basic, and irreducible. It is the perennial source of strength, the spring of clarity. Even when it may seem ugly, it is never false.

Are not these fundamental qualities essential to architecture as well? Is there inherently anything a skin can do that a structure could not? Could the structure be shaped to perform also the functions of the skin? From these questions to the concept of a modular, cast-in-place concrete bearing wall involved only one step.

## Low Budget Spurs Research

The years between 1957–1960 were a trial of convictions, and a test of patience. New opportunities arose in the field of housing, and we soon discovered that economy of means was *the* essential prerequisite for this type of construction. Apart from all other reasons, cost considerations precluded the use of precast concrete. Thus it was logical to turn to cast-in-place concrete, because it was the only available low-cost material other than brick.

*Concrete: ". . . a material capable of taking possession of shadows. . . ."*

Among apartment builders, particularly in New York City, there was very little enthusiasm for innovation. Facing this discouraging background was the enormity of the problem. The great experiment in urban renewal called for the invention of better and more genuine architectural forms for living. To realize them, as far as we could determine, was to develop cast-in-place concrete so that it would become acceptable to the sponsors, to the FHA, to the lending institutions, and to ourselves. The challenge was exciting, but the road promised to be thorny.

Original architectural form cannot be created without deeply understanding the material it is made of. Matter sustains and nourishes our inspiration, and only by the fusion of the two realms of matter and form into an inseparable unity can the resulting object be imbued with an original life of its own.

The material we wanted to understand was cast-in-place concrete—so widely used but still unknown, so humble yet infinitely versatile and eloquent.

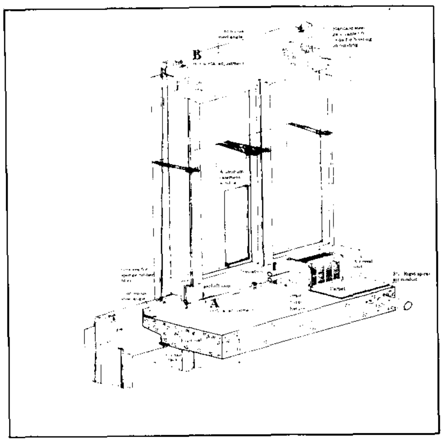
There was much to learn about this seemingly simple material, and the more we knew, the more there was to learn. This is not to say that technical knowledge was lacking about concrete as a structural material; but architecture and reinforced concrete, in the context of American possibilities and requirements, simply had not come to terms at that time.

There were gaps of knowledge, because the material was not architecturally acceptable, and also because architecture had not yet created itself in the image of the material's own potentialities. Understandably, our efforts were oriented toward filling those particular gaps.

## Beyond the Research

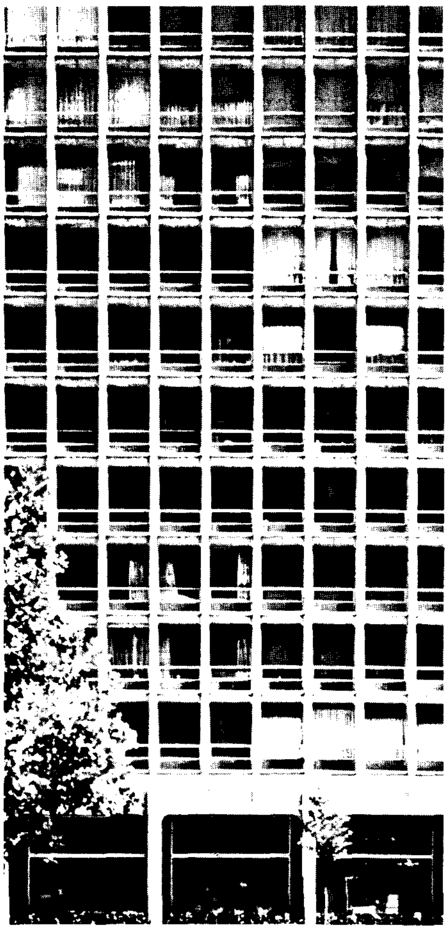
We were concerned with sources of materials and their effects on the appearance of the finished product, coloring and pigmenting action by natural aggregates, sands and chemical additives, phenomena of surface crazing, shrinkage, and thermal cracks and ways to minimize them, finishing techniques, testing programs before construction, elaboration of controls during construction, ways and means of translating intent and experience into drawings and specifications. The goal was an architectural material that would be strong, durable, easily maintained, and remain good looking.

This may sound as if a complete program of research had been formulated



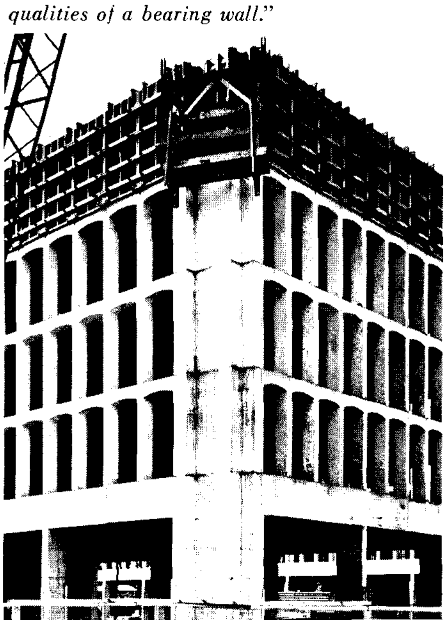
DENVER HILTON HOTEL.

*". . . façade units cast with sand and gravel excavated from the site."*



KIPS BAY PLAZA, NEW YORK, N. Y. PHOTO: JOSEPH W. MOLITOR.

*". . . a structural grid . . . rigid in its own plane . . . dense enough to assume the plastic qualities of a bearing wall."*



HYDE PARK, CHICAGO. PHOTO: GIBSON STUDIO.

from the beginning. But, in fact, it started from the most obvious notions, enlarging itself step by step: sometimes by design, sometimes by intuition, occasionally by accident. It combined the initiative and experience of many before a substantial matrix of knowledge was formed. It is unlikely, however, that our curiosity in concrete would have been as intense, or that it would have lasted for as long, if we had not seen behind this vast field of technicalities a vista of new architectural possibilities.

## Farewell to the Curtain Wall

The immediate result of this vision, and of the work we put in, was a prototype idea applied to the first generation of our cast-in-place apartment building: Kips Bay Plaza in New York City, Hyde Park in Chicago, and Society Hill in Philadelphia.

The one characteristic common to them all is the exterior wall: the façade. These walls are a structural grid modularly spaced to permit different layouts of apartments, yet rigid in its own plane to take wind loads, and dense enough to assume the plastic qualities of a bearing wall.

Structure and architecture were molded into one and the same form, and built in a single operation. Only the window frames and glass were needed to complete the elevations and enclose the buildings. And these buildings had real walls: the curtain wall was left out.

Much of our concrete research was applied to these three projects. In Chicago, for instance, we were lucky to have the McHugh Construction Company as concrete subcontractor. One of its side activities was producing forms. Faced with the prospect of casting 4000 identical window modules, and with some encouragement on our part, McHugh decided to form them in fiber glass instead of wood. Again, as in Denver, the key to the decision was the large repetition.

I believe this was the first full-scale application of this kind of forming in the U. S. The advantages were obvious. The molds could be made large enough to form four typical windows in one piece: they were light and strong, needed minimum assembly and disassembly, and could be re-used many more times than plywood.

I still remember my delight and disappointment over the first test pour. The absolute precision of the corners and the perfection of the planes, which were so smooth as to be almost shiny, were marred all over by innumerable air pockets. We soon found out that the imperviousness of the plastic form was the cause of it. The air and water in the concrete had no place to go, and could be easily trapped unless the placement of the concrete and the vibration method were adapted accordingly. I only mention this episode because the development of precise, shop-manufactured plastic forms is an important stepping stone, and much of what we are doing today would not be possible without this development.

In Hyde Park, little advantage was derived from this inherent precision, for it was not merely a question of molding concrete; rather, it was a process of remolding architecture.

The transformations that took place in these three projects were striking but not complete. Today, an examination of the three plans reveals their hybrid nature. The exterior wall, which serves both an architectural and structural function, encloses a conventional interior plan.

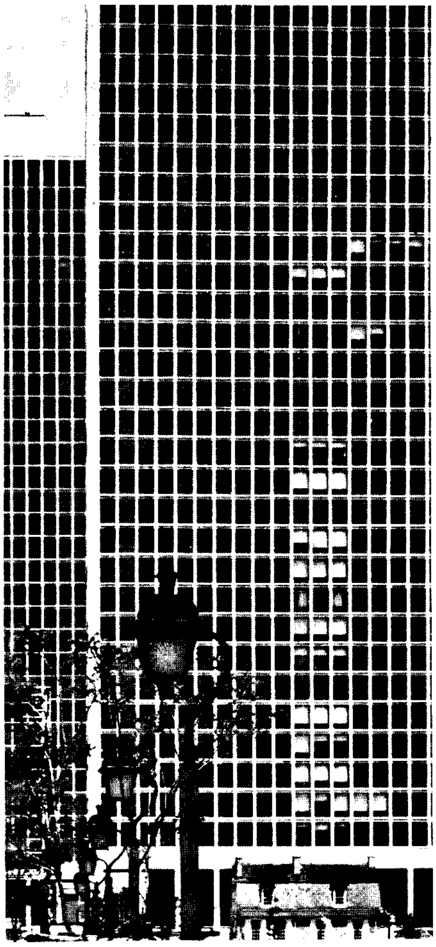
At that stage, we were unable to liberate ourselves from the servitude of interior columns. Hidden in closets, or surrounded by bathrooms and kitchens, these columns, although structurally necessary, lacked any architectural purpose, and, if anything, impeded rather than helped the development of apartment plans.

They were there because we were unable to conceive an economical configuration by which these parasitic elements (in the sense of an organic approach to architecture) would be made superfluous. But even if we had been able to advance such a solution, I doubt it would have been adapted. The drastic changes on the exterior were as much as circumstances would bear. One more step and Kips Bay Plaza, along with the other two, might never have been built.

## MIT Buys a Tower

By 1960, isolated experiences with architectural concrete began moving closer, and even flowing together, with other ideas. Like a jigsaw puzzle, these first pieces, placed correctly next to each other, started outlining an idea not quite comprehensible in its entirety. We were able to use the new, although rudimentary, alphabet of cast-in-place architecture with more self-confidence and articulation.

The immediate object of attention was the Earth Sciences Building that I. M. Pei and I were designing at MIT. The circumstance was fortuitous, because the building program, which called mainly for laboratories and offices, allowed the concept of a tall and slender tower. Small floor areas, stacked on top of each other, instead of being strung along corridor-streets, were a drastic departure from MIT's horizontal way of life.

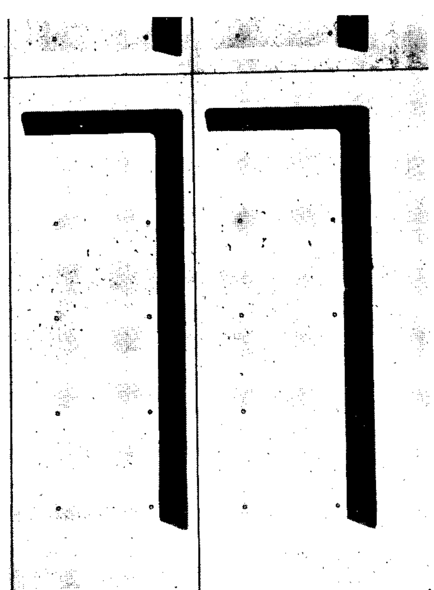

SOCIETY HILL, PHILADELPHIA PHOTO: ROBERT DAMORA

*"Structure and architecture were molded . . . and built in a single operation."*


PHOTO: GEORGE CSERNA

EARTH SCIENCES BUILDING, MIT, CAMBRIDGE, MASS

*"We used cast-in-place architecture with more confidence and articulation."*


EARTH SCIENCES BUILDING, MIT, CAMBRIDGE, MASS PHOTO: GEORGE CSERNA

The effect on the traditional silhouette of the Institute was certainly another departure, but the Eastman Court, with seven architecturally different buildings surrounding it, desperately needed a strong focus to rally the space. Besides, scarcity and the high cost of land warranted the best possible use of the available resources. It was a logical decision on MIT's part, both in space and time, to go vertical.

In addition to changing the exterior pattern, the Institute decided that the tower was to be its first fully air-conditioned building. Before then, only essential laboratories had been air conditioned.

The scheme for the tower is simple and straightforward. It rises 280 ft high, with elevators, stairs, and mechanical services located at the two end walls. The tower is enclosed on all four sides by a continuous bearing and self-bracing structure.

Floor beams spanning 48 ft across the building provide a clear 4500-sq-ft floor at each story. This enables floors to be used for small offices, libraries, or a 300-seat lecture hall.

## Fitting Glass into Concrete

The building is all muscle and no fat. Inside and out, architecture and structure are fully integrated. There is literally nothing that can be taken away or added without damage to either. We even eliminated window frames.

The slender, monolithic block was an extension of everything we learned before. The volume, with its deep carvings and recesses, aspires to the same order and scale as the original buildings by Bosswell.

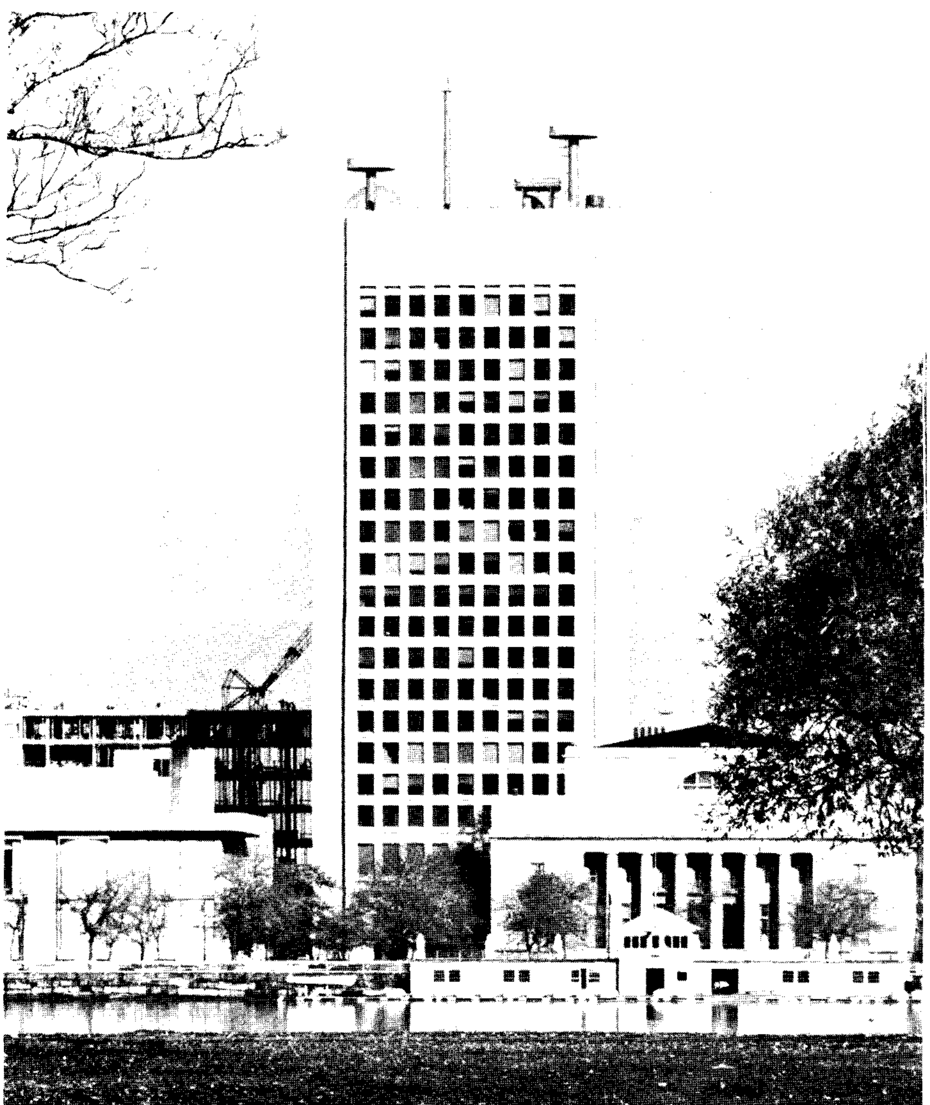
The fiber glass forms used for the exteriors were a complete success—so much so, that, both in smoothness and precision, the finish of the cast-in-place surfaces was indistinguishable from the precast window sills.

Relying on the built-in precision of the forms, we omitted all metal window frames, and specified the glass to be glazed directly into concrete. As expected, the precision of the mold transferred itself

EARTH SCIENCES BUILDING. MIT. CAMBRIDGE. MASS. PHOTO: GEORGE CSERNA.

*Pierced beams and lighting fixtures create a grid defining the ceiling plane.*

*"The slender, monolithic block was an extension of everything we learned before."*



EARTH SCIENCES BUILDING. MIT. CAMBRIDGE. MASS. PHOTO: GEORGE CSERNA.

automatically into the stone, and the glaziers *did not* encounter any unusual difficulties due to dimensional tolerances.

It was a far cry from a similar idea in the Denver Hilton lobby. This time, we did it consistently for the entire building. The largely unnoticeable detail of plate glass framed directly into the structure endows the tower with an air of irreproachable modesty.

## Sandblasting Controls Weathering

The aggregates for the concrete mix were selected to match the limestone of the rest of the campus.

After erection, all the exterior concrete surfaces were lightly sandblasted and then sealed with silicone. The sandblasting not only cleans down the building, but also removes the thin film of cement formed against the hard fiber glass surfaces that gives the concrete a "pasty" look. Besides, the rain and the acids in the air eventually erode the cement film in patterns that are completely uncontrollable.

The sandblasting, therefore, is, in effect, a preweathering process applied uniformly to the whole surface. By exposing the tough stone aggregates and sands, not only are weathering characteristics improved, but the concrete gains a more natural appearance.

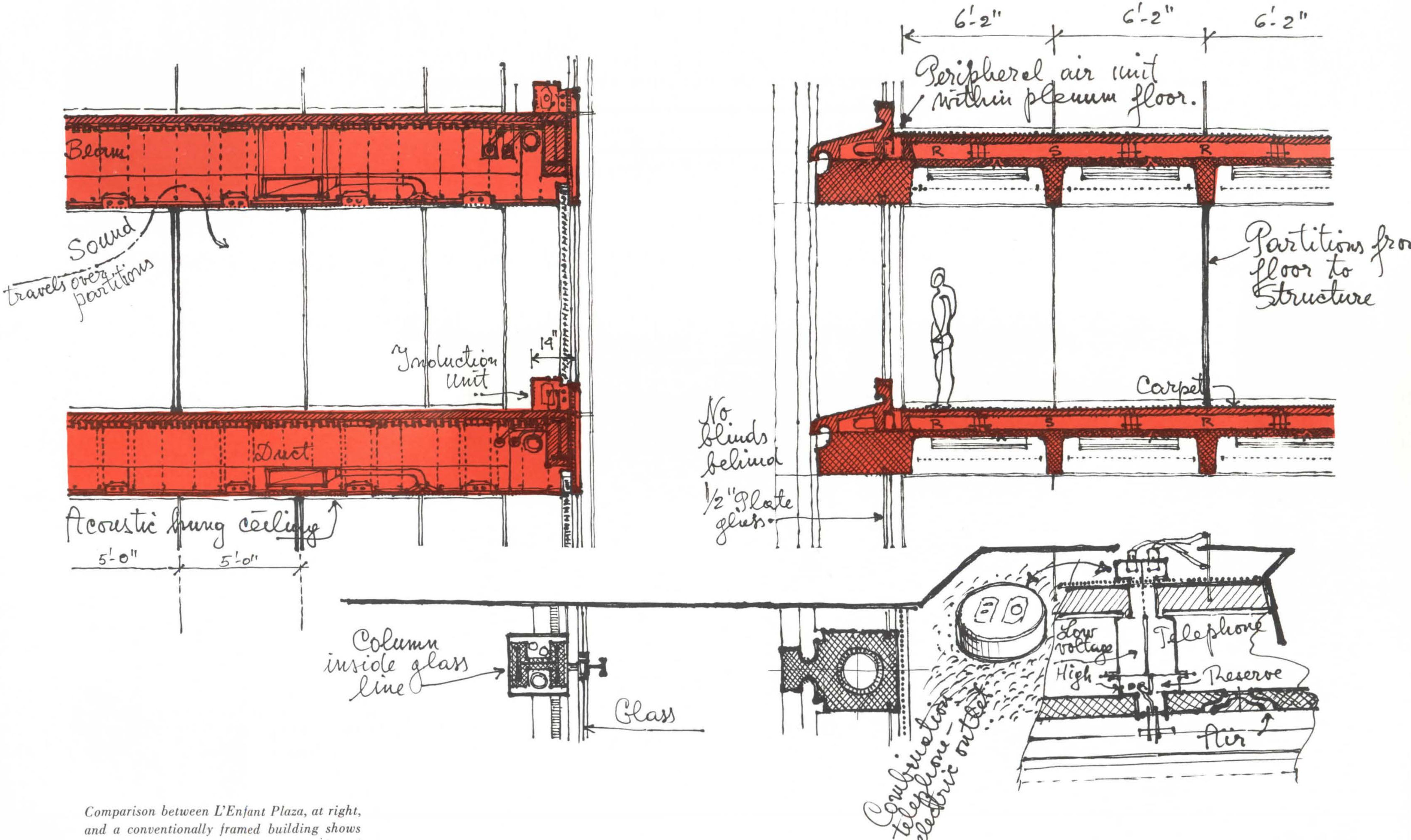
## Beams Define Ceiling

The inside of the building was conceived as a simple workshop for research and study. The slabs and the 48-ft-long beams, spaced 9 ft apart, were cast in plywood forms, and, when necessary, were patched before painting.

These 42-in.-deep beams, each pierced by four octagonal holes, create a grid, with lighting fixtures hung between the bottom flanges. This construction defines a ceiling plane. Above the fixtures, telephone cables, pipes, and ducts from exhaust hoods extend horizontally through and between the beams.

Thus, the laboratory services are visible and accessible, but contained; this was a firm requirement from the beginning. The lights are contained between the beams. The peripheral induction units are contained between columns. The branch pipes and ducts are chased through the columns. The partitions are contained between the floors and the beams.

In every respect, the integrated structure and architecture asserts itself as the organizer of space in all three dimensions.




*Comparison between L'Enfant Plaza, at right, and a conventionally framed building shows the loss of volume due to structural and mechanical requirements. The integrated L'Enfant Plaza structure not only eliminates the waste space above a suspended ceiling, but also shields windows from solar glare.*

The visible mechanical network, however unattractive, is always visually controlled.

The idea of containment was not original. But dealing with mechanical elements as visible parts of an over-all architectural equation focused my attention on a world which, more often than not, is left to the sole discretion of the mechanical engineer. This focus was sharpened by the tough and knowledgeable director of MIT's physical plant, Carl Peterson.

## Keep Mechanical Systems in Place

Peterson demonstrated that unnecessarily long pipes and ducts, superfluous bends and complicated connections, all result from faulty planning. They will not only produce an unsightly installation, but, even worse, will be costly and wasteful at the expense of architecture.

Such waste is intolerable. To do a job less well with more effort does not make sense. Besides, we knew very well that there was no room for waste in the case of the Earth Sciences Building.

We wanted to make sure that this would not happen. With consultants, we traced every riser, duct, pipe, or feeder from its source to the terminals. We planned and replanned the disposition of mechanical rooms, shafts, closets, chases, and sleeves until a clear, simple, and economical system of networks crystallized within the over-all concepts of structure and architecture.

It was a most tedious exercise. But the course I took was absolutely invaluable. From then on, these pipes, ducts, and devices ceased to be mere copper, steel, glass, or plastic. It seemed as if they were carrying energy and movement, breathing air, regulating their functions by automatic controls, and responding to a range of preset conditions almost as if they were capable of thought. Instead of a static installation, the image (and such images have tremendous force) became irradiated with life.

The notion carried powerful implications. I became acutely aware that this vast mechanical realm, the most revolutionary addition of our modern age to architecture, is often left out of our thinking. Instead of making it an integral part of architecture, we had invented ingenious hiding devices that assured quasi-total autonomy for the mechanical systems. No wonder that this man-made life, implanted into the skeletons of our buildings, could not find its true expression.

## Low-Cost Plan for Washington

It was not long before an opportunity arose to confront this problem in its broadest sense. For a number of years, ever since the spring of 1959, I had been working on the general plan for the Tenth Street Mall and L'Enfant Plaza in Washington, D.C.

Because of its size and complexity, and since it was part of an urban renewal area, the project advanced at an agonizingly slow pace. Nevertheless, by 1962 the situation seemed ripe enough to start designing the first two of the four main buildings surrounding L'Enfant Plaza.

Specifically, the program called for the construction of two identical office buildings of 300,000 sq ft each, the realization of the Plaza between them, and an underground parking facility for about 1400 cars.

The conditions of the program were difficult. The concept of the Tenth Street Mall and the Plaza implied nothing less than a monumental design approach. At the same time, they had to compete both in initial cost and rental with the run-of-the-mill, speculative office buildings mushrooming all over Washington. In practical terms, it meant building for less than $20 per sq ft.

At first glance, the requirements were irreconcilable. A superficial survey of buildings on a similar budget was more than discouraging. And, as I looked at "successful" projects in Washington and elsewhere, my sense of orientation sometimes almost left me. Was I in Atlanta, Los Angeles, or Peoria, Illinois? It was impossible to tell by the buildings I was in. They tried so hard to be different, but the more they tried, the more similar they became.

## But Not At Any Price

Looking at buildings in this cost range, I could not find even the seed of an idea that would help me solve the L'Enfant Plaza problem. There were, however, buildings like the Seagram and the Union Carbide buildings—the real pace-setters in office design. Quite apart from their outstanding architectural qualities, these buildings carried out, within their own assumptions, the systematization of the modular theory to what seemed to be the ultimate boundaries.

Unfortunately, the price for such perfection was completely beyond our range. Although the amenities provided *should* be part of any office building, the budget dilemma appeared insurmountable.

But were these crystal towers and glass prisms, passed down to us with such transcendent force by the cubists and purists, truly invulnerable in their logic? Was their implied simplicity intrinsic or only apparent? Did the poetic prophecies of some 40 years ago remain valid in the face of an evolution that followed a logic of its own?

In short, had the time come to reevaluate and realign our own dreams with the changed realities perceivable from our new vantage point. Without being sure of any of them, I was eager to learn at least some of the answers.

## Ascending Technology

The historical evolution of the "crystal box" and the tracing of its morphology could in itself be the subject of a fascinating study. It would show how, through a series of fundamental mechanical innovations, major changes in the configuration of buildings became possible. Undoubtedly, the "crystal box" appeared as an idealized abstraction of things to come.

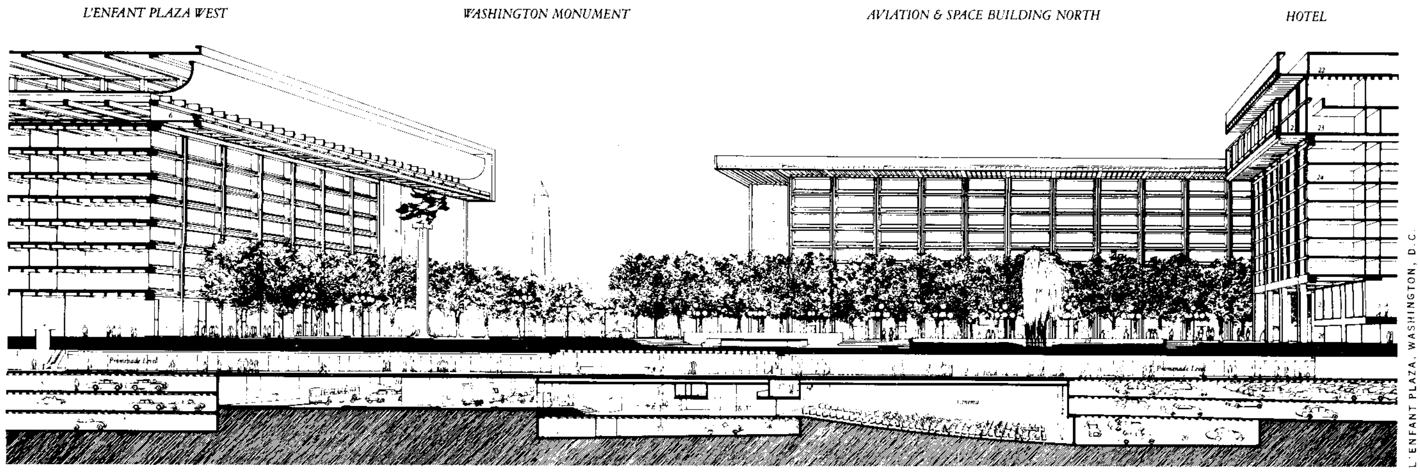
Meanwhile, progressive improvements came about step by step, layer upon layer, until the innumerable components developed into a stratified, supersophisticated collection. As the complexity of the machine grew, a parallel process of fragmentation set in, thus dividing the responsibilities for building design into a number of specialties.

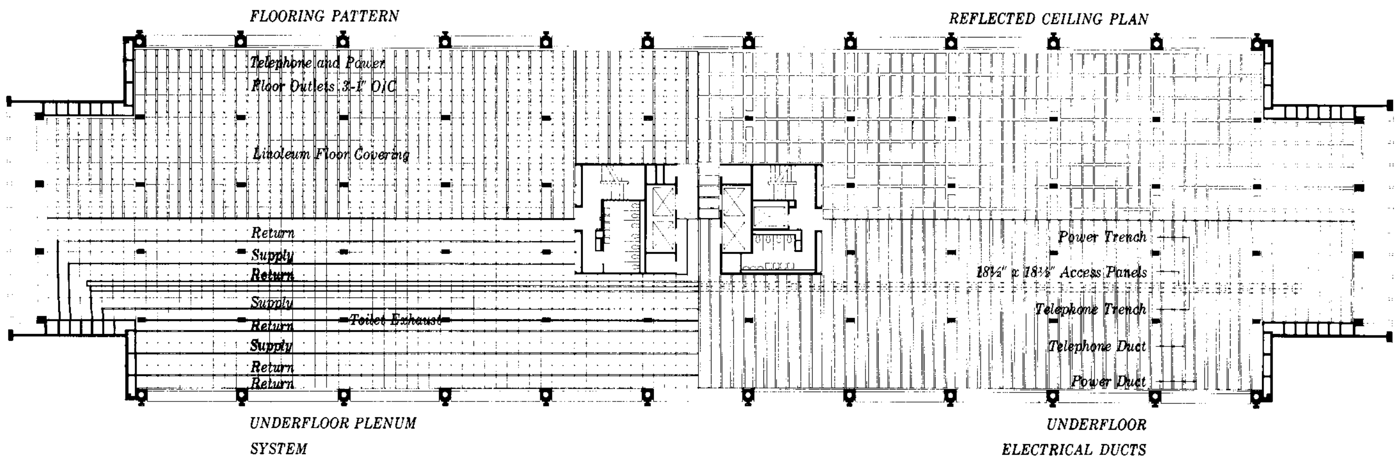
The architect's traditional grasp of his buildings as a unity was dislodged by waves of swift technological upheaval. Structural engineering became untouchable, mechanical design incomprehensible, and the manufacturers of building products showered architects with such an array of materials, in every conceivable shape, texture, or color, that they succeeded in confusing the profession and confining its freedom of action.

Instead of dealing with essentials of space, structure, and proportion, architecture became entranced with veneers, skin construction, with intricacies of the latest ceiling system, or inventing more ingenious ways of covering up the gadgetry and handiwork of the engineers.

## Squandering Space Above Ceilings

Shall we look behind the gleaming curtain-




*The lower left quadrant shows the plan of the plenum. The air supply and return followed the same disciplined pattern as the visible parts of the building. In fact, they reflect and serve the basic organization. No unilateral decisions on the part of the engineers or the architect are possible in this approach, since every component serves several functions in addition to its main purpose.*

wall panels or remove a portion of a luminous hung ceiling? What we see there has little to do with the abstract purity and simplicity of the "crystal box." In these shadowy regions, beams and girders, ducts, pipes, conduits, and wires criss-cross, interlace, and intertwine in a desperate attempt to reach destinations without interfering with one another. And the higher the building standards, the greater is the squeeze, and, of course, the more costly the end product.

As I thought through these problems, very obvious questions came to my mind. I wondered whether expert builders and real estate developers also ask themselves these questions.

- Why lose one-third of the building volume in the space above ceilings when only a part of it is occupied by beams and ducts?
- Why are efficient long spans made prohibitively costly by penetrations for air distribution ducts and the need for making up air lost in the deep space above suspended ceilings?
- Why use peripheral fan-coil or induction units that occupy between 5 and 12 per cent of net rentable space?
- Why use large glass areas that have to be sealed off from sun and view by Venetian blinds?
- Why do partitions framed into hung ceilings have low acoustic properties despite high quality materials?
- How much is the real cost of tenancy in addition to rent?

Astonishing as it sounds, when a typical office layout is revised, the changes to ductwork, partitions, lighting, and electrical outlets cost more within the lifetime of a mortgage than the original cost of a building.

## So Long, Suspended Ceiling

The question arose that the original preconceived shape of the rectangular or square curtain-walled office tower, hung onto and structured by the traditional steel frame, may be at the root of these many inner contradictions. Was it not possible that a highly specialized assemblage, in which every part is allowed to perform only one single function, inevitably forces vast overlappings and duplication of materials and expenditures?

If so, such inefficiencies clearly must be paid for in one way or another. In low-budget buildings, this is always achieved by cutting down on amenities and architectural quality. In prestige buildings, the wastefulness of the concept is covered up by more generous budgets. Neither choice is a happy one.

Admittedly, having experienced the freedom and flexibility of shaping stone concrete into structure and architecture at will, I was most reluctant to exchange that freedom for the shackles of steel handbook construction, which, with all its inevitable consequences, seemed in the context of other possibilities almost archaic in approach. Besides, sooner or later, the soft underbelly of architecture—the hung ceiling—has to yield its place to structure integrated with architecture.

## Put Ducts Under Topping

In a nutshell, the idea I advanced for L'Enfant Plaza was that of sandwiching the air distribution between the structure and the usual 3-in. fill, instead of confining it in the customary sheet metal ducts under the structure.

Various forms of double floor construction were available for electronic computer installations. We adopted the most promising one, which had been thought out by Granco Steel Co., and I used this as our point of departure.

As was to be expected, some very hard-boiled questions followed this radically different proposal. Anticipating it, I decided with my associates, Owren Aftreth and Lien Chen, and the structural and mechanical consultants, Weiskopf & Pickworth and Syska & Hennessy, to test the idea to destruction. Surprisingly, the pieces of the puzzle fell naturally into place without strain or friction. So, instead of having to justify the system, we could explain it with full conviction.

## Base Module on Space Requirements

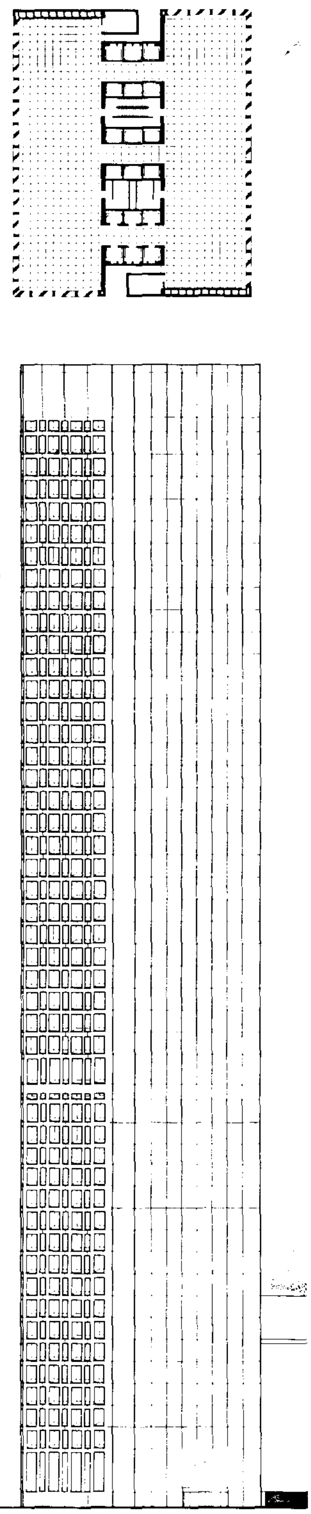
The floor structure, designed for a 100-psf live load, was conceived as an efficient two-way waffle slab with ribs spaced 3'-1" in one direction and 6'-2" in the other. The structural module and office module were purposely made to coincide.

The dimensions were not derived from a standard width of metal, plywood, or plastic sheets, but from such elementary notions as desk sizes, desk spacing, door widths and the necessity for combining maximum office flexibility with best use of floor areas. We were free to form the structure in any logical size or pattern, due to the tremendous repetition of 27,000 units of the basic module.

Precision forming of the floor structure was, therefore, the logical technique. The one-piece fiber glass domes, incorporating apertures for air conditioning, lighting, and other fittings, will inevitably mold the concrete coffers to the precision and smoothness of white plaster. Air supply and returns and light diffusers provide all the advantages of a luminous ceiling, giving more than 100 ft-c of illumination without the usual surface glare.

The consistency of the unit is complete throughout. Nowhere are there odd-sized left-overs to be fitted according to job conditions. Movable partitions not only are ideally suited, but are specified as the building standard. Acoustically, these partitions will not leak (a typical occurrence in hung ceiling installations), since they are framed between floors and the underside of structural ribs.

Carpeting will be used throughout, making any further acoustical treatment unnecessary. Not only is sound well controlled, but noise emission is greatly reduced and floor maintenance simplified. In addition, each module contains in the floor a dual electric-telephone preset insert, ready to be energized where and when necessary without the need of cumbersome drilling through the concrete.



EATON CENTRE, VANCOUVER, B.C.

## Raceways Support Topping

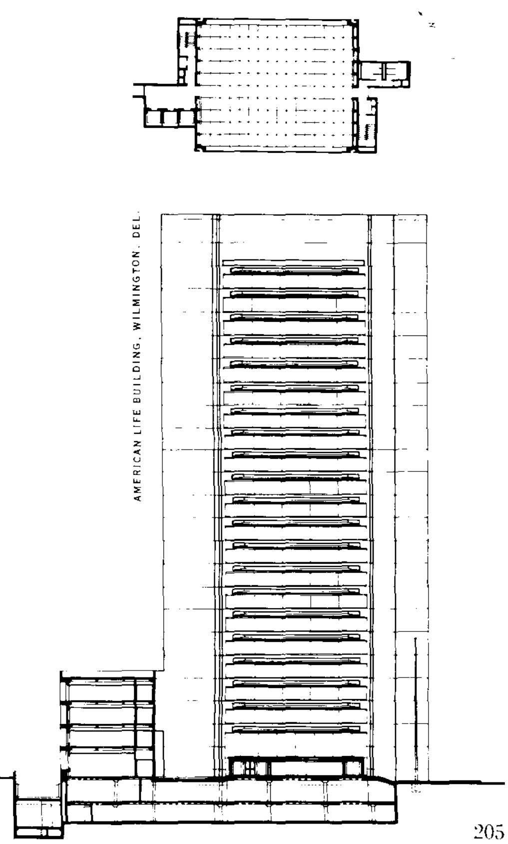
The air distribution is confined between the ribbed structure and the 3-in. secondary slab, which is supported by parallel electric-telephone raceways extending the length of the building. The three elements form jointly the 7-in.-high supply- and return-air plenum ducts.

Because the whole width of the building is used, the cross-sectional area is so simple that air can be circulated at low velocity, combining silent operation with substantial savings in first cost and maintenance. But even more valuable is the ability of moving air to and from each single office module. Once the system is balanced, rearrangement of office partitions during the lifetime of the building poses no more problems than moving office furniture around.

Partitions can be flexibly changed into new configurations, due to the complete autonomy of the module. The 3'-1" width of the module assures the most effective subdivision of the valuable window wall. The peripheral induction unit that normally projects into a room is eliminated in favor of an all-air unit set flush into the double floor.

The module itself is the measure of

*". . . principles of integral architecture, implicit in L'Enfant Plaza, open the doors to vast new possibilities."*



AMERICAN LIFE BUILDING, WILMINGTON, DEL.

today's office equipment. Each of these attributes and many others truly enhance the value and usefulness of each square foot of the building floor area.

## Waste Space Drastically Cut

How does this floor construction measure up to the standard approach? A glance at the comparative section will show that at least 1 ft was shaved off the floor-to-floor height, at no expense whatever to the interior space. On the contrary, the offices benefit from the additional volume within the coffered ceiling. Instead of one third, only 15 per cent of the building is devoted to structure and air distribution.

This economy in height was particularly significant in Washington, where zoning limitations restricted us to a 90-ft height. Not only was I able to fit in an additional floor, but enough room was left for the large roof overhangs, projecting like lofty awnings some 15 ft beyond the faces of the buildings.

The vertical air-distribution shafts feeding the plenum ducts are concentrated in the four inverted, L-shaped corners of the buildings, which also serve as main wind bracing structures.

The window walls, a massive grid of beams and columns 27 ft o.c., contain the deeply recessed, 24′ x 6′ lights of tinted glass. Despite their size, they are so well shaded by the projecting structure that Venetian blinds are unnecessary for controlling heat gain or glare. The sun shading is done externally, where it is most efficient and does not impede the view.

## Better, But Not Dearer

At L'Enfant Plaza, the mechanical network is integral with the architecture. Each part performs double and triple duty. Overlappings and duplications have been cut out wherever possible. The result is a new breed of building, with amenities matching any office building in the U.S. Uniquely adapted to its function and unmistakably individual, nobody will ever confuse it with another place.

Last fall, all of us who participated in the realization of the project had a moment of satisfaction and gave a deep sigh of relief. When the bids were opened, the original budget figure given to us in 1962 was fully and irrevocably confirmed.

## Return to Classical Simplicity

In the great periods of stone building—the Greek, the Romanesque, the Gothic—distinctions between structure, ornament, and architecture simply had no relevance. They were all carved out of the same external-internal continuum of architectural mass and space. The three dimensions not only are the essential domain of architecture, but, as Focillon observes, "They also are like gravity and equilibrium, its very nature."

Today, despite mechanization, and mostly because of it, the same intrinsic simplicity is again possible and within reach. We must diligently learn how to bring it about. The underlying principles of integral architecture, implicit in L'Enfant Plaza, open the doors to a field of vast new possibilities.

Already this same approach is further evolving, as it is being applied to my design for the 44-story Eaton Centre tower in Vancouver, the Christian Science Church Center in Boston, as well as to Pei's concept for the American Life Building in Wilmington, Delaware, now under construction. Even the Bushnell Plaza Apartments in Hartford, Connecticut, underwent a radical transformation in this direction. The plan and structure is a far cry indeed from the early days of Kips Bay Plaza and Hyde Park.

## Concrete Makes It Possible

Paradoxically, the integrity and interior simplicity of these plans are not necessarily reflected in rectangularity or squareness. On the contrary, their metamorphosis and internal organization suggest the observance of a quite different logic. Have these plans grown into these unusual forms because of the construction material used, or some other inherent assumptions?

Undoubtedly, they would have little meaning were it not for reinforced concrete. But, "Aesthetically, concrete has neither song nor any story," as Frank Lloyd Wright wrote in *The Nature of Materials*.

If architectural mass and space is defined first of all by proportions—a system of mathematical relationships — then fleshed in by matter and brought to life by light, does the invention of such spaces or such proportions that will tell a story or sing a song, still depend on us and on us alone? The answer is yes and no.

Yes, because—to quote Focillon again —the ". . . action of the experiment is evident at each of its crucial points." And, by experiment in integral architecture, ". . . I mean an investigation that is supported by prior knowledge, based upon a hypothesis, constructed with intelligent reason and carried out in the realm of technique."

No, because, having reached the threshold of form, the process ceases to be merely a vista of the creative mind. Form takes over from there on, as if aided by a new force. Again quoting Wright: "All things in nature exhibit this tendency to crystallize, to form mathematically and then to conform." Like nature, art also molds itself from without as much as from within.

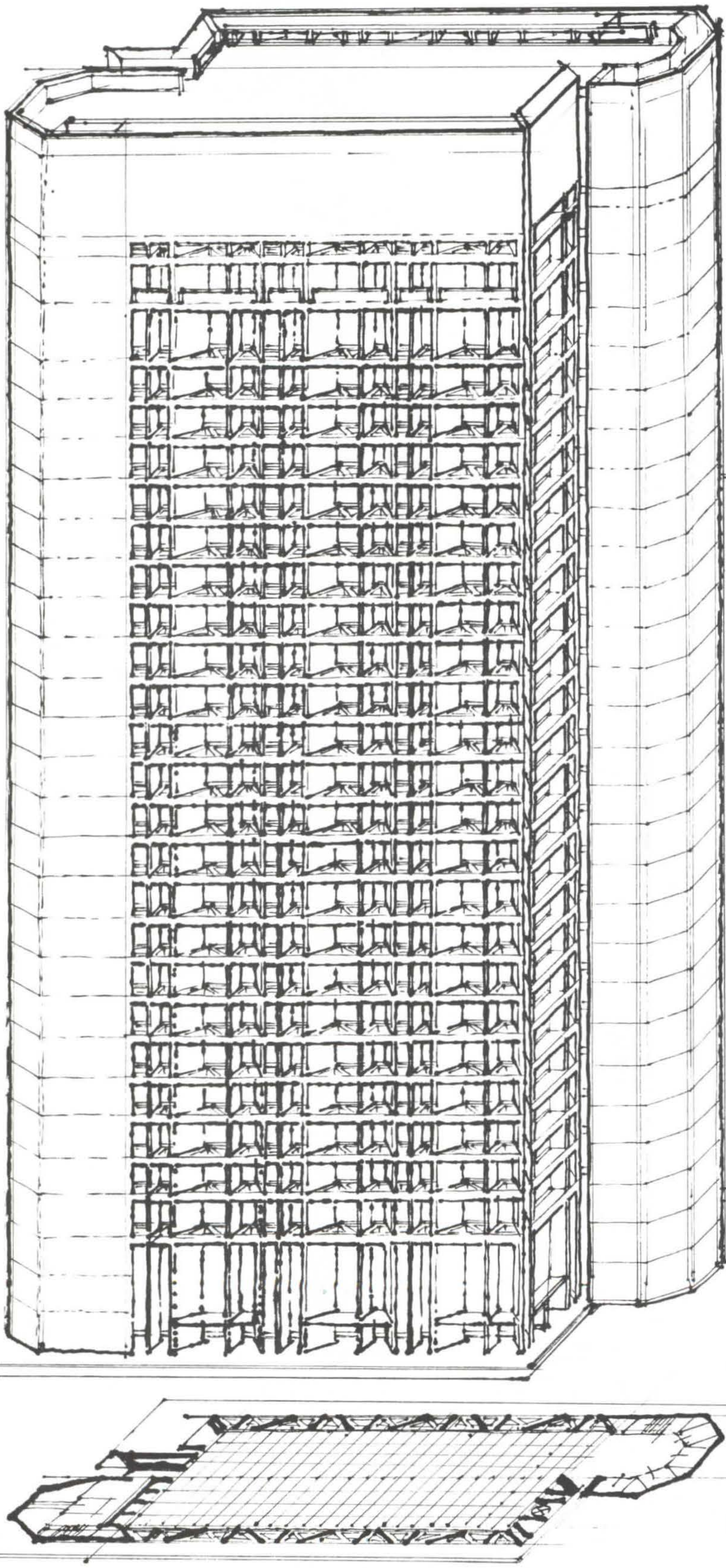
Therefore, by integral architecture, I mean forms that will result not only from an external organizing will, but also from an inner organizing logic. They shall not remain only as incarnations of our thoughts. They must feed upon their own resources, summoning themselves together by principles of their own, engendering complex laws with matchless rigor and discipline. Only then will these forms come through as true, living forms—the very essence of our time.

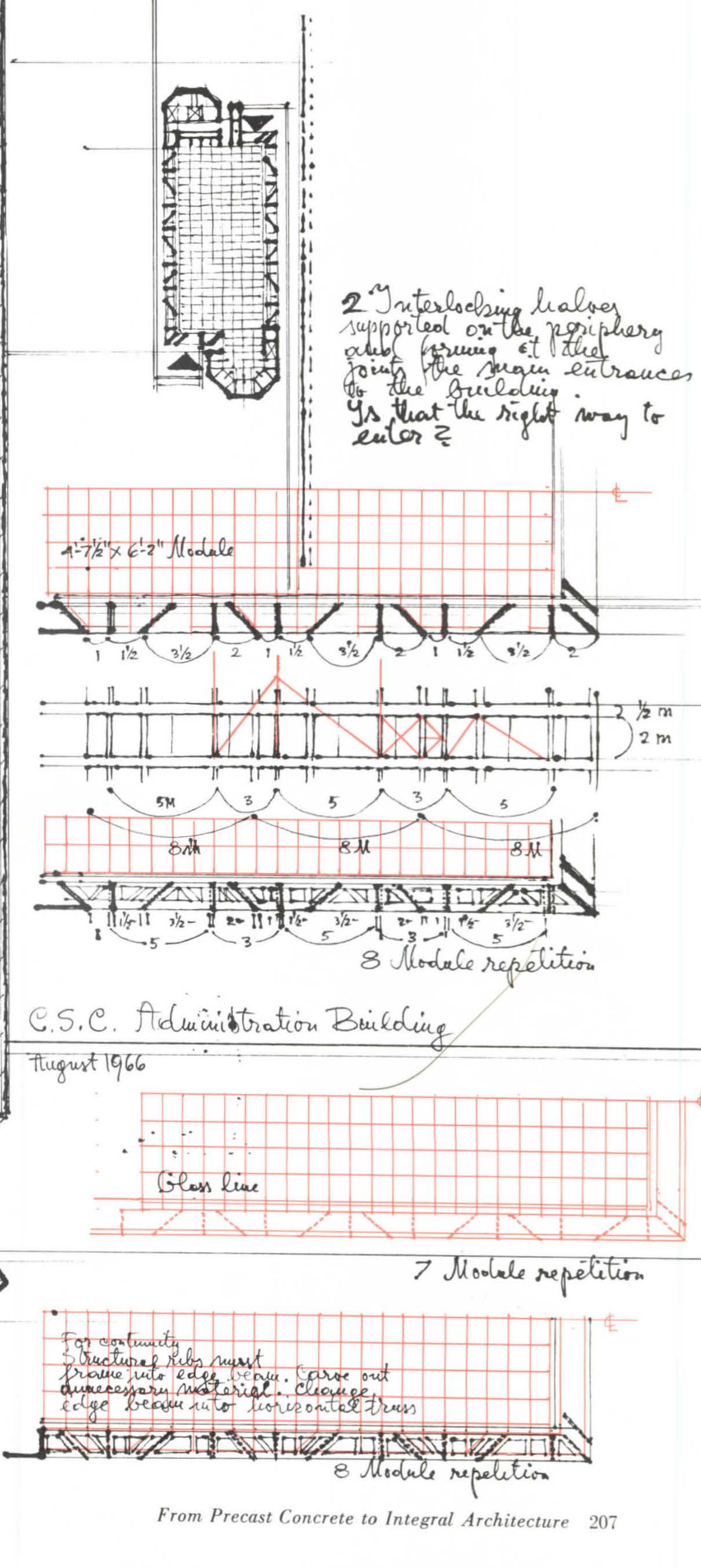
## Unite the Profession

There is one more important observation. If the ideal of integral architecture is to be given true meaning, the cleavage between engineering and architecture must first be repaired. The stratification of the engineering and architecture disciplines, and the ensuing engineering "mystique" resulting from the drastic technological upheavals of the last 80 years, must be replaced by the fusion of all these disciplines into a union of creative action.

This vastly enhances the domain of an architect's activities. But to enlarge the limits to his freedom, he must first extend the boundaries of his knowledge. His understanding of building must become total and cease to be specialized if he is to become master of his own house once more. There cannot be integral architecture without an integral profession.

*Design sketches for the Christian Science Church Administration Building show how the supporting structure affects the appearance of the building. Loadbearing walls comprise vertical components set at an angle to the façade and horizontal trusses located at each floor level. The walls serve as sun shields without obstructing the view from within the building. Sketches at right represent exploration of module systems.*





# KOMENDANT ON CONCRETE

**Consulting engineer August Komendant talks about a client, Louis Kahn; a major Canadian project, Habitat '67; and some shortcomings in concrete engineering.**

## Instinctive Concrete

Louis Kahn has his own, extremely profound architectural philosophy, coupled with a very creative mind. He always uses a functional approach, "servant to purpose," to solve architectural problems. He uses masses, areas, and depth as a basis of architecture.

When Kahn designs, I don't think he actually considers the material. He may say that he does, but I don't think he actually does so. It seems to me that the material most closely responding to his architectural philosophy is concrete and thus his selection is instinctive.

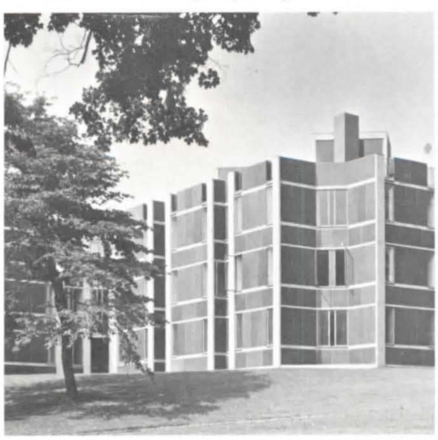
I base this belief on the fact that his design preliminaries are almost always brilliant for concrete. He does not split the surface, and his architecture is "heavy duty." And so is concrete.

I doubt that Kahn's architecture could be executed in marble, because I don't think of marble as a heavy-duty material. If Kahn tries to use a light material, he betrays his own basic philosophy and gets confused. When he uses another material to protect concrete, his decision is based on erroneous evidence, mishaps through previous misuse of concrete, or some other contradictory factor.

You often see designs where the structural system and the material of which it is made cry desperately over their incompatibility. This is because the freedom of choice to carry out their duties most effectively, and in accordance with their special characteristics, has been violated.

Buildings can tell wonderful stories of how they are made—from the gravel pit and cement factory to the final touch of the finisher—and also how they carry out their functions structurally. Only if the story is clear, pleasant, and exciting can the building be called true architecture.

*"It could be made of anything."*



BRYN MAWR COLLEGE, BRYN MAWR, PA.

PHOTO: COURTESY, MUSEUM OF MODERN ART, NEW YORK CITY.

Of all Kahn's buildings, the most completely satisfying is the Salk Laboratories. A design is right in concrete when it could not have been built in any other material. When you look at Salk, you unhesitatingly answer that it could not have been built in any other material. As for Bryn Mawr, an unequivocal answer is not possible. It could be made of anything.

## Multiple Choice

The engineer serves the architect best when he gives the architect a freedom of choice. For instance, for the church in Rochester I gave Kahn about 16 alternatives. We had lengthy discussions. I showed him all the possibilities as far as structural function was concerned. I really did not give a damn: All 16 solutions were structurally safe.

If I had had a rigid mind that said, "There is only one solution," it would be saying, that, as an engineer, I knew only one system. If you have a wide knowledge and experience, you will find there are many solutions. But the architect must make the decision as to which of these suits his purpose best, supplies the atmosphere he wants, and is most pleasing to him. The architect is qualified to make this decision; I am not. I may have taste, but he has trained knowledge in architecture, as I have in structural systems and materials.

## Engineer as Critic

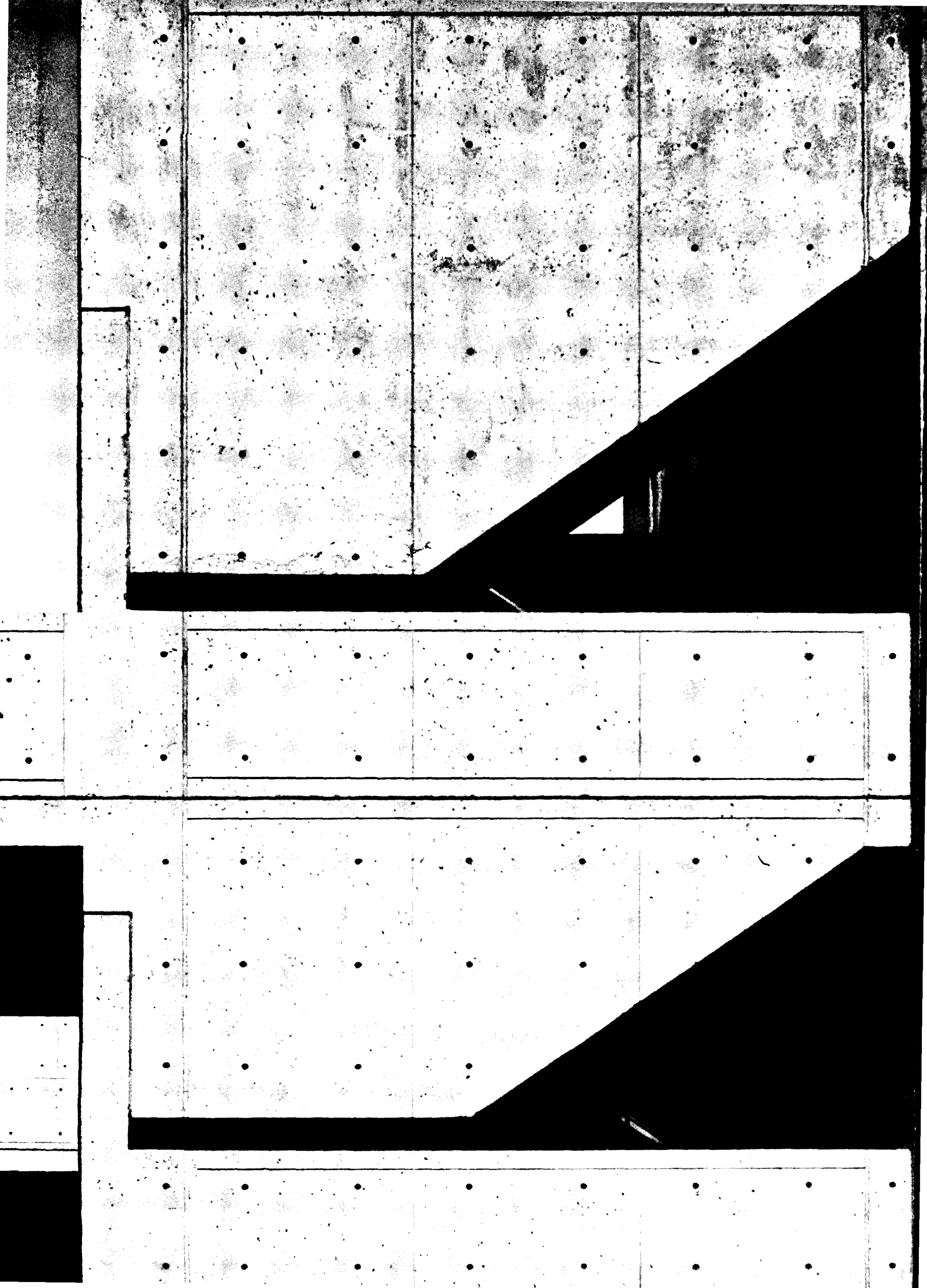
The second service the engineer can give the architect is to criticize. I may be completely wrong, but I have the right to criticize. And the architect will consider that perhaps there is some point in what I say. If something is perfect, you must also tell the architect, for he needs support very much. He is in continual doubt. When you encourage him, doubt disappears and the architect is a free man again.

The third service is practical experience. It is as important to know how to construct as it is to know how to design.

As an engineer, you are always an outsider and simultaneously an insider, too. But the architect is *always* an insider, and as such he is not honestly able to criticize another architect, or assess the true value of his design.

Most architects criticize what they see and feel about a building's external qualities only; such criticism is highly subjective, often misleading, and mixed with individual taste and concepts. True criticism must be objective, and based upon

*"... it could not have been built of any other material."*



the internal as well as the external qualities of the building. To evaluate the internal qualities of a contemporary concrete structure requires a thorough knowledge about carrying systems, materials, and their use and behavior.

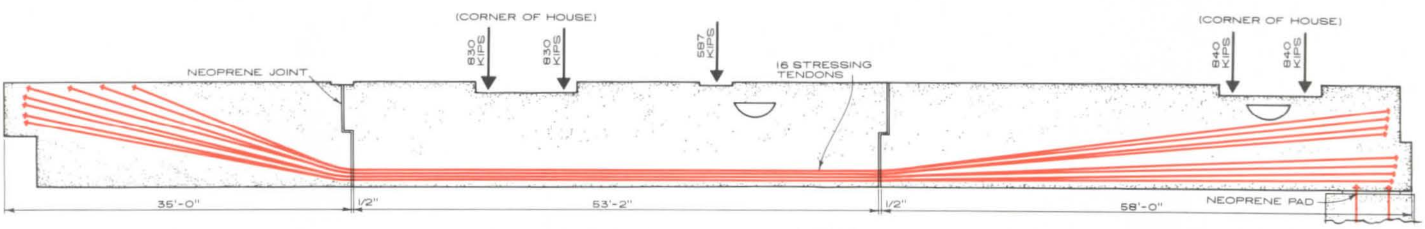
Thus, an up-to-date engineer is of more help as a critic to an architect than a fellow architect can ever be.

## Stressed Concrete

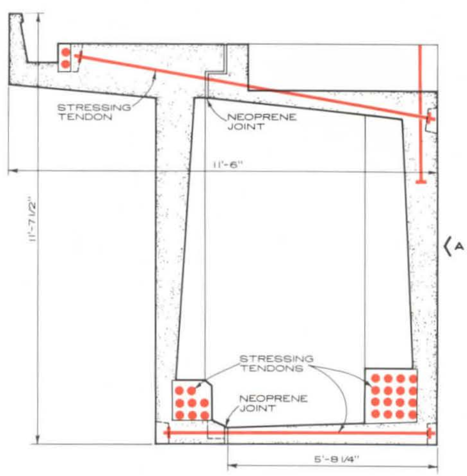
There was nothing wrong with the original pyramidal structural system proposed for the Habitat project in Montreal (see p. 226). It was good for a seismic area because it kept the center of gravity very low. But, in this case, the structure was more important than the function; the servant was more important than the purpose. And, when this happens, it is not architecture; it is something else.

The system now being used for the revised, smaller Habitat is a crystal-like structure. It is very functional and expressive. It comprises a variety of cantilevers made stable and efficient by a combination of beam, suspension, and arch actions. The cantilevered house-unit clusters are vertically and horizontally supported by huge street girders spanning up to 190 ft and carrying tremendous loads (dead, live, and seismic). One of these girders has a prestressed force of more than 5000 tons.

As can be seen in the drawing, most of the loads are carried directly by suspension action to the supports. The remaining shear is carried by the girder itself. If the concrete girder had to carry the total shear, this design would not have been possible. One cannot assign functions to a material that is not able to perform.




ELEVATION OF GIRDER LEG (AT A)




SECTION THRU GIRDER

## Pioneering Design

The problem with very complex designs like Habitat is that the extent of the participation of various carrying actions can be estimated only by deformations. This, unfortunately, requires a knowledge of material constants before they can be computed.

Furthermore, the common structural theories do not apply, because the system is composed of boxes and panels, instead of beams and slabs for which the standard theories have been developed.

At the beginning of the project discussions, engineers of industrial associations were enthusiastic about participating, but they lost interest after they realized how complicated Habitat actually was. The excuses given were usually that they objected to interference from governmental authorities, committees, etc.

Besides the theoretical structural problems, there are manufacturing, handling, and erection problems that must be considered and incorporated into the design. If these had been overlooked in the design phase, the complex could not have been erected. The timing of manufacture, handling, and erection is determined by the erection scheme.

The street and house units are manufactured in a factory that is close by, and are transported by a 100-ton travel lift to the hook of the crane. This lifts the precast units into the over-all structural system of stacked units.

All connections between the concrete units are provided by dowels and post-tensioning. Units are separated from each other by neoprene bearing pads so that deformation can occur, and concrete is not subjected to tensional stresses. In addition, the neoprene separation provides the ductility required to reduce seismic forces.

There are no members that do not participate in the carrying action of this complicated structural system. Without this concept, the project would not be economically possible.

## The Habitat Team

I met with the so-called advisory committee of Habitat only once, and was disgusted because every second word referred to building codes. So I told them that if they wanted me to design and carry through the project to the end, I would like not to have any interference. I would appreciate any help that they could give me, but it would have to be up to standard.

I don't particularly like technical historians and I don't like to waste my time listening to and arguing about their obsolete views, which are at least 20 or 30 years behind the times. I told the committee that if they built a thing like Habitat, they would have to forget about codes. We don't know what the codes will be when Habitat is built.

Col. Churchill, Director of Installations for Expo '67, the owner, is a very flexible and an open-minded engineer. He told me, "No committees will bother you. You will be the code. Habitat will be your responsibility."

The architect, Moshe Safdie, is a very intelligent man. He is young, still flexible, and very creative. There is no friction between the architect and engineer because there is no other way out, if the work is to be accomplished. I respect his views and I help him as much as possible, and of course this is mutual.

## Figured Concrete

Most engineers, as well as most architects, are ignorant of what concrete actually is. Architectural concrete could be 8000 psi and still be bad concrete. If concrete loads to 5000 or 6000 psi, it is considered to be good concrete. This is not the case. The 28-day cylinder test is often the only criterion used, but it is a mistake to consider only this test of concrete.

Architectural concrete must be stable, must not stain, and its color should be consistent. I have seen the work of famous architects who thought of concrete control solely in terms of the compressive test, and the results have been very annoying.

The mix must be designed so that it is completely watertight. Absorption of moisture from the atmosphere by exposed concrete should be limited to an absolute minimum. If it is not possible to do this, other means must be employed.

For instance, a silicone treatment might be used. There is an affinity between silicone and cement, and, in a perfect application, the active silicone causes a crystallization so that the concrete surface is closed and practically everlasting.

## Concrete ABC's

Handling, placing, and timing of concrete is also very important. A limited quantity of water is required for placing and to create a colloidal state. After crystallization starts, a portion of the water hydrates the cement, and the rest is left in the concrete as free water.

Free water does not help concrete. It creates capillary forces that support shrinkage and add to plastic flow. Light pressure and high frequency vibration will reduce this water considerably. I frequently check correct placing and curing on the site.

## You Can't Steel Concrete

Concrete is the predominant material in contemporary architectural structure. A recent European report shows that, during the past 25 years, more than 90 per cent of most structures, including bridges, are built with concrete. Steel is available, but concrete is used for aesthetic and economic reasons.

An additional factor in the use of concrete is its sculptural quality. Steel is a strange material. You don't like to have it stare at you from odd angles, and it usually has to be covered.

## Concrete Test

Whenever something goes wrong, you must investigate the causes. You have to analyze the mishap, and make small experiments. It then becomes a research project of "let's find out." You must carry out most of your tests at the site, not in the laboratory only; anything can be made to work in the laboratory.

We need industrial help to make tests, but the most important experiments are carried out by the engineer at the site with on-site material and under on-site conditions.

## The Economical Cable

Economically, the factor that contributes most to the extensive use of concrete today is the use of prestressing and post-tensioning. Strands are the most economic way of carrying a load, and are more than eight times as effective as any other carrying action.

Our previous concept of beams and slabs was, in my opinion, a confusing use of the material. Analyzing a structure, it will be found that four types of stresses are required to accomplish the carrying action of a simple reinforced concrete beam: tension, compression, shear, and bond. In the sense of its carrying action, the beam is not at all efficient.

The productive action of concrete in an ordinary reinforced concrete beam is about 15 per cent. But, in prestressed concrete, the steel strands can give us almost 100 per cent efficiency in the use of suspension and arch action.

The controlling factor of structure today is economy. Cathedrals used to be built over a 100-year span. And how much did it cost? We have much more money today than was available to builders in the Middle Ages, but we are guided by different philosophies.

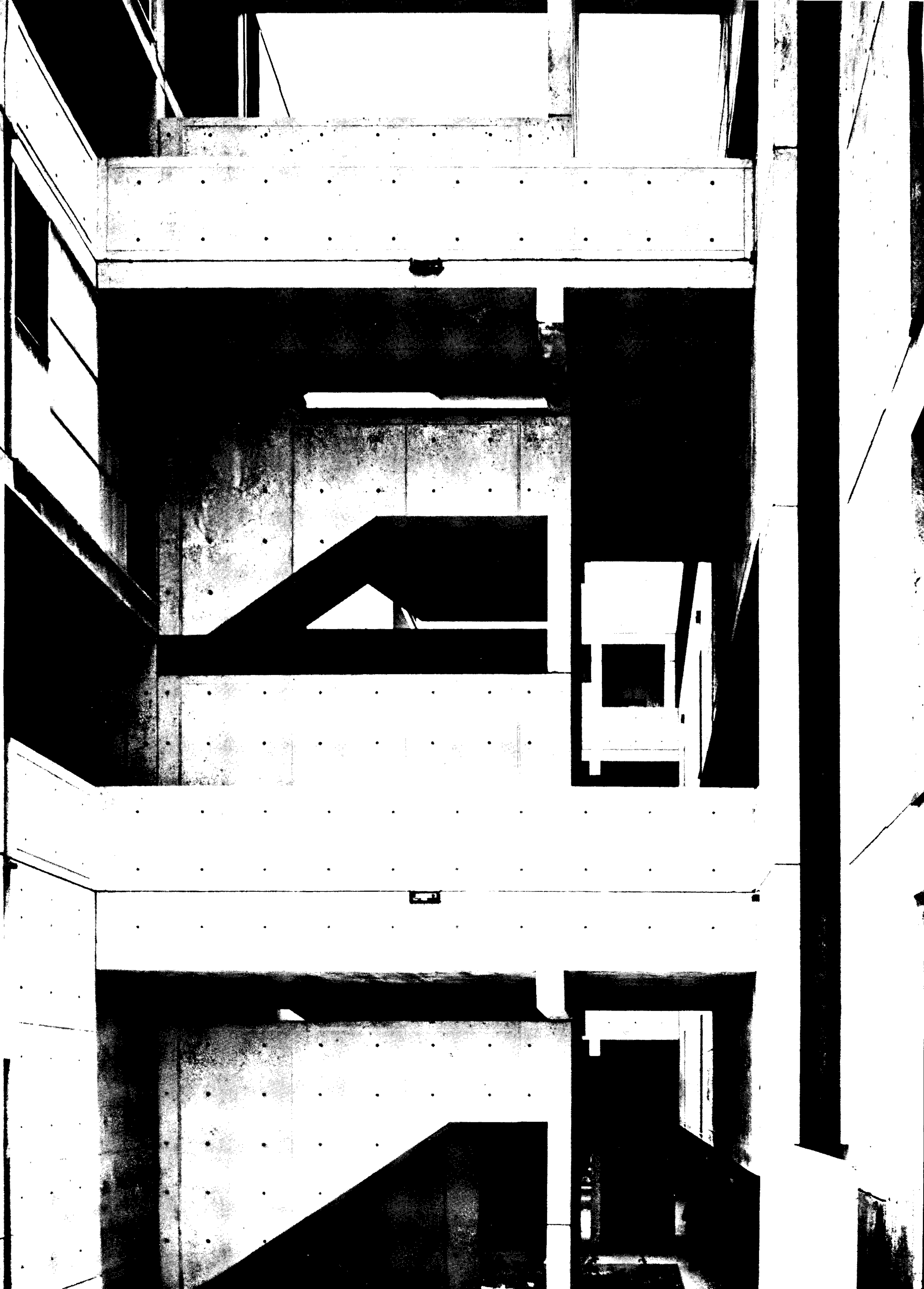
Our idea today is economy. Why should we waste money when we have the means of making economic structures? I do not use economy in the sense of money only, but in connection with engineering ends-and-means relationships.

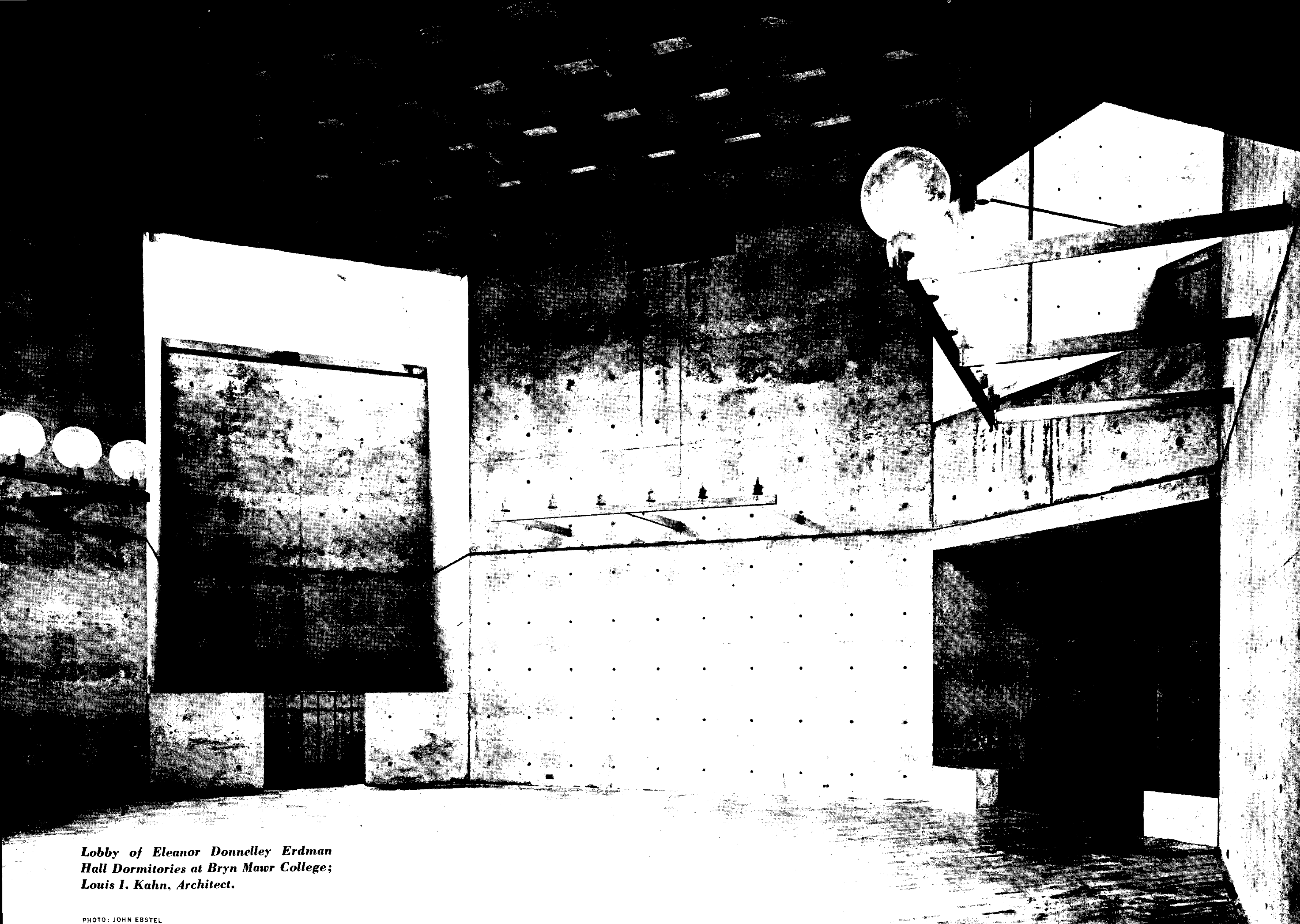
In a sense, economy is the engineer's integrity: I can do many things to show that I have money, but when I do a thing economically it proves I have intelligence.

## No Cement Concrete

Thinking about the future of concrete, I would say that we would have the best concrete when we don't use cement at all. If we could develop an epoxy plastic and use it to replace the cementing action in the mix, we could produce a material like granite. Such a mixture would not be subject to plastic deformations, and would not change in the course of time. This, to me, would be the future of concrete.

Even though we do not have this perfect material, we must respect the inherent values of the material that we do have. We must esteem its honesty. Its normal, natural surface is the most valuable in architecture. To paint architectural concrete would be like painting gold.





*Lobby of Eleanor Donnelley Erdman Hall Dormitories at Bryn Mawr College; Louis I. Kahn, Architect.*

PHOTO: JOHN EBSTEL

# CONCRETE INTERIORS

It is the dream of many architects to build with concrete consistently, throughout the interior as well as the exterior.

Several architects come to mind who have been interested in exposing and expressing cast-in-place concrete extensively: Louis Kahn, of course, Gordon Bunshaft, Paul Rudolph, Walter Netsch, John Johansen. Any proposed tally of the status of this activity would make one think a lot of concrete is being used in this way to make interiors integral—organic, if you remember—with the exteriors.

The facts, however, indicate a different situation. One can probably find only two dozen buildings in this country, built in the past two decades, that show concrete used extensively on the interior with any aesthetic intent.

"We haven't done this the same way that Rudolph and Kahn have," says Kevin Roche. "The other people tend to get walls of concrete. It is not that we have consciously refused to do it; just that we haven't done it."

"We like the idea of exposing concrete on the interior," says Frederick G. Frost, Jr., concurring, "but when you come to looking at what you've done about it, it doesn't amount to much."

"It probably is true that concrete hasn't been used very much on interiors," Rudolph observes. "After all, it has taken a good time to get it used to any degree on the outside, so it is bound to take time to see much of it on the inside. It is all a matter of time."

The reasons for concrete not being used more extensively on the exterior are given elsewhere in this issue: industrial development, code restrictions, and public acceptance. For interior use, however, there are no code restrictions that would seriously prohibit using concrete. Thomas Long, of the Portland Cement Association, notes, "You would probably exceed the code requirements with concrete interiors."

Public acceptance is another matter. Clients in general, it appears, simply do not like concrete in interiors, finding it unsympathetic and visually unattractive. One critic has said that people are looking for a softer, warmer, more tender expression in interiors, and there is very little you can do to concrete texture to achieve this. Furthermore, as Raymond Epstein points out, a rough texture looks different in a small interior space than it would in an exterior application, when seen at some distance.

But concrete appears to be disliked for other reasons also. Actually, one finds a texture like monumental seersucker a rather rough emery board to brush against in a room. How hard a brutal concrete is on clothes and skin has never been seriously examined. People even wonder if you can get insurance against persons scratching themselves on rough interior concrete. Paul Rudolph says he never heard of any and counters with, "Did anyone ever get insurance against a rough brick wall or for a band of Louis Sullivan panels?"

There are also some practical difficulties for architects. Although Daniel Toan, of Warner, Burns, Toan & Lunde, says, "Concrete is the same as the Gothic tradition —the same material inside and outside," Frederick Frost finds "it better not to expose the same cast-in-place concrete member both outside and inside because of temperature conduction, which causes condensation on the interior."

Hugh Hardy points out that you have to make double walls or give up the concrete on one side or another. "We're lushed up and air conditioned, unlike Gothic times," he explains.

"If you use 3000-psi concrete to keep the water out," Paul Rudolph counters, "it becomes a dense concrete but it is still a reasonable insulator. My argument always is that it is a lot better than glass. I don't build double walls because of the expense. It is easier offset by conditioning the air."

Why architects continue, then, to be hung-up on the ideal consistent interior-exterior concrete expression seems somewhat inexplicable. It is an old argument—the matter of structure as finish. Yet no other "organic" living thing is built the same on both interior and exterior. A turtle shell, a snail shell, or the human body would not be so comfortable a shelter if they were as "consistent" as architects would like to have a concrete building.

Furthermore, in strictly functionalist terms, one is hard put to defend interior and exterior surfaces as serving similar purposes. In fact, much as we love it, the consistent use of concrete throughout both exterior and interior of a building may in time prove to be one of the major aesthetic rationalizations, if not aberrations, of this century.

Brilliant some of the interior uses have been, however.

Paul Rudolph is one of the architects most dedicated to this goal; perhaps more than any other he has cast entire buildings. He admits, however, that details such as the buckless door in what is sometimes waggishly referred to as Yale's D&D

Building, where the concrete itself is poured as the buck, the attachment of the hinges into the concrete was a finicky and perhaps an uneconomical gesture.

Walter Netsch, another of the architects whose use of both cast-in-place and precast concrete is forceful and extensive, approaches this problem of attachments differently. "Since the concrete is the most permanent surface," he comments, "our technique is to keep as much off of it as possible. We try to keep circuits out of it, for instance, and put them in plaster shafts adjacent to the concrete, since plaster is a more pliable, moldable thing."

"The pouring of the concrete is the important thing," Netsch continues. "And if you have to worry about the size of a grille opening or about fiddley details in the form, then the vibrating is difficult and you get honeycombing. If you want to insure the consistency of the surface, you try to make the pouring of the material the important thing."

From this, it becomes evident that the most important reason for the lagging use of concrete in interiors is industrial development—and not only that of manufacture but also of construction.

"A very good contractor is important," Rudolph says ominously.

Peter Samton of Kelly & Gruzen elaborates: "The big problem with exposed concrete as an interior finish is one of workmanship. Edges get broken during construction and the patching is never even. Workmen cannot be convinced, no matter how much talking and instructing you do, that the concrete is the finished wall. So they prop bucks against it or make notes on it with crayon or paint. Once it gets stained or broken, you can't ask the contractor to tear down the wall.

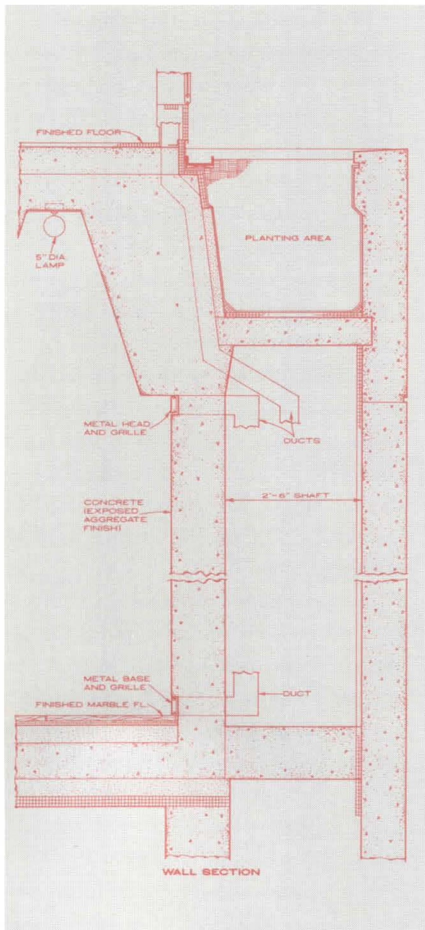
"Rough concrete," Samton continues, "is one solution. So far as keeping it fresh is concerned, smooth concrete is the major problem. It's a problem of concrete craftsmanship."

Because of the novelty of the material to the majority of contractors, even though there is considerable use of concrete in schools, hospitals, houses, and offices as hallway partitions and screen walls, the largest volume of the concrete in interiors is in block. Thomas Long of the PCA observes, "The major factor is the traditional fabrication sequencing. As we become more adept in the traditions and the fabrication, masons can utilize concrete better in interiors. But putting partitions in as we go up with the frame, as they

PHOTO: EZRA STOLLER

*Roy Allen of Skidmore, Owings & Merrill, New York, says, "The cheapest thing you can do is a cement plaster ceiling. If you expose a concrete ceiling there are problems of getting air conditioning to the interior of the building, and problems of attaching partitions. At our Des Moines building, we had to provide a number of pool spaces for large departments of workers on the upper floors, so the exposed ceiling of tees was right for the American Republic Insurance Company's needs. But pool spaces that cannot be easily partitioned are not good for diversified uses. Flexibility governs this interior-exterior matter, and so the opportunity to carry concrete through a building—total integration of concrete structurally and in finish—is very limited. Exposed concrete architecture is not going to replace furred ceiling architecture, I am sure." (See contradictory opinion of Aldo Cossutta, p. 196.)*

*On the lower floor of the Des Moines building (top), SOM used what Roy Allen feels is the most flexible exposed concrete ceiling—the waffle slab. The prestressed waffle slab was cast on plastic pyramidal forms, then painted. Air-conditioning vents are concealed in black spacers at base and head of exposed sandblasted concrete wall on right. The sandblasted wall is rough enough so that people stay away from it; consequently, it does not get marked.*




WALL SECTION

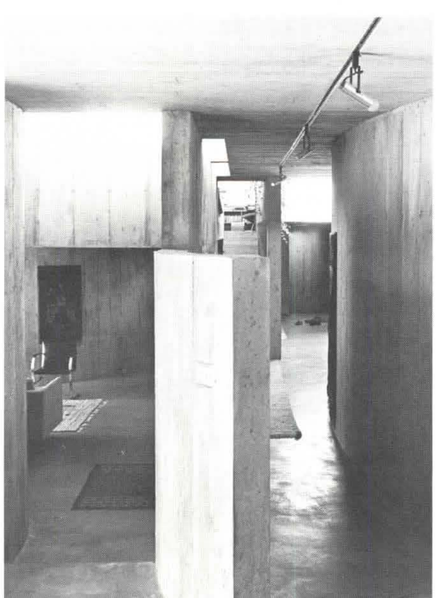
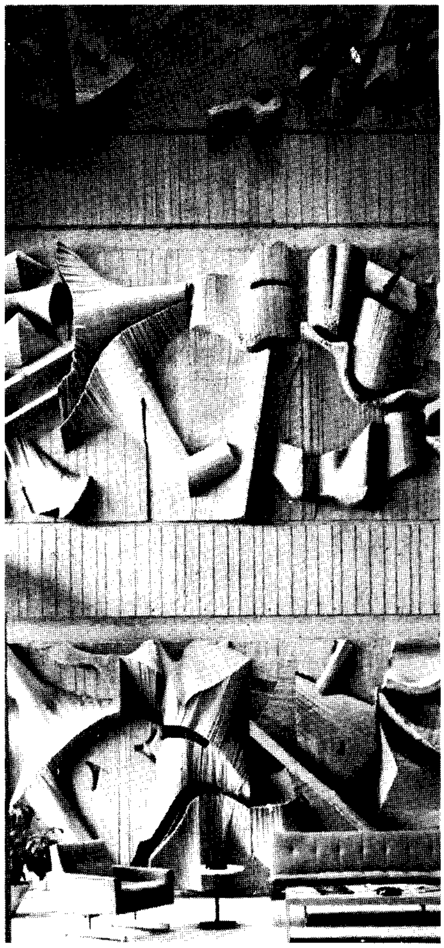


PHOTO: THOMAS MC NULTY

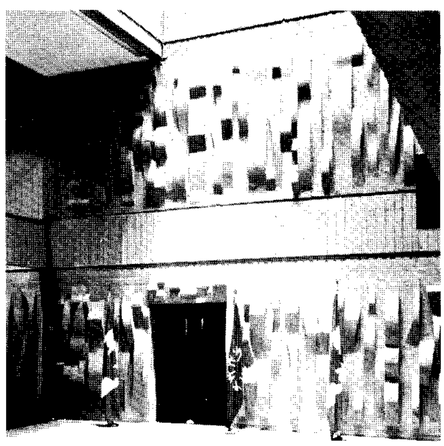
*Architects Thomas and Mary McNulty, whose house in Lincoln, Massachusetts, is of cast-in-place concrete outside and in (bottom), remark that "an austerity is implied in the treatment of the concrete," but also that "the simplicity of construction places an emphasis on the individual." About the building process, they point out, "The contractor considers that the biggest problem was communicating to the workmen and tradesmen what was going on. It was the liaison between those executing the architectural design that seemed so extraordinary—novel yet traditional. Novel in terms of today's mass and industrially oriented labor market, with its generally erosive influence upon craftsmanship and personal involvement; traditional in its recall of the guilds and mystic brotherhoods, which, in earlier building periods, supplied an inspiration and framework of relationship that could assure close collaboration."*

*Lightweight aggregate and air entrainment were used for the 8-in. silicone-coated exterior walls to improve insulation. Floors were polished and finished with an acrylic coating.*

*Concrete can be sculptured to provide a variety of decorative textures as well as overall textures, as the three entrance courts to the administration pavilion of the 1967 World Exhibition in Montreal indicate. Each entry has a three-story well that is ornamented by floor-to-ceiling concrete creations of three different Canadian sculptors. Toronto's Tom Bieler executed a curved and fluted series of fragmented objects (top); Montreal's Ulysse Comtois designed a ribbon-like concrete weaving (middle); and Montreal's Armand Vaillancourt produced rugged sponge-like sections studded with chunks of blue-green glass. (bottom). All the sculptures were cast in plaster molds, then placed as infilling panels on the concrete walls of the building.*



PHOTOS: ARNOTT ROGERS BATTEN LTD.



would most economically be installed, would require a complete new view on the part of our contractors. Eventually, this may come along. In Russia, at the present time, interior walls are prefabbed as panels, and they go up with the frame. But there is more control over industry in Russia."

There is another industry concern—the matter of maintenance.

"Every material has a maintenance problem," an architect points out. "With concrete, there may be a question of dust. Can you control the mix so you don't have to dust; what do you do when it gets dirty? Do you wash it? If so, how? Maybe the problems are so great that people should not use concrete on the inside. Maybe they are not."

"You vacuum-clean it," Rudolph says, smilingly pointing out that he is always serious. "Or you take one of those wide brooms to it."

"High-gloss paint is good for low maintenance," Walter Netsch says in a balanced way. "It makes a tough surface on a tough surface. Or we sandblast it."

Thomas Long adds, "Silicone is not necessary on interior panels. New latex oil base or plastic paints can be used on concrete surfaces, or you can stain it with ordinary stains. Rubber-base paints won't peel inside." For exposed concrete, Long continues, "Marking can be remedied by soap and water; solvents would knock off ink and crayon; and a real light solution of muriatic acid and washing would clean it, but this is messy inside. Some masonry units have a thick layer of plastic cast right on the block, so that you have a smooth surface that is easier to clean."

"Once the maintenance people take over," a critic reminds us, "they add things. At one concrete building they added a clock, and ran the cable, an exposed conduit, right across the concrete surface. It looks really ghastly. In the usual construction, you could cover those things up, because it is much more flexible. No doubt one reason concrete is not used as much on the interior as architects would like is because, as everyone knows, it is cheaper to plaster than to fiddle around with the concrete."

No serious historian would want to discourage any attempt at consistency, nor, happily, could any seriously discourage whatever will happen. But clearly, several practical problems will have to be solved before any widespread use of exposed concrete in interiors can be expected.

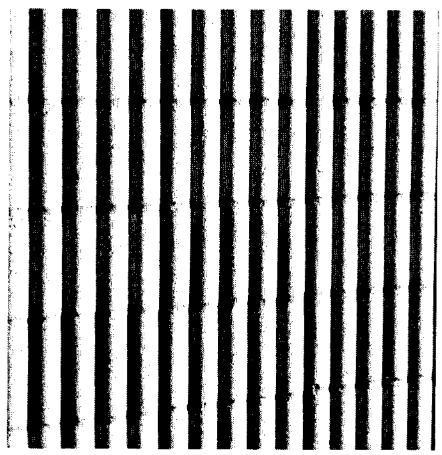
Several architects have things to say about the future of this direction:

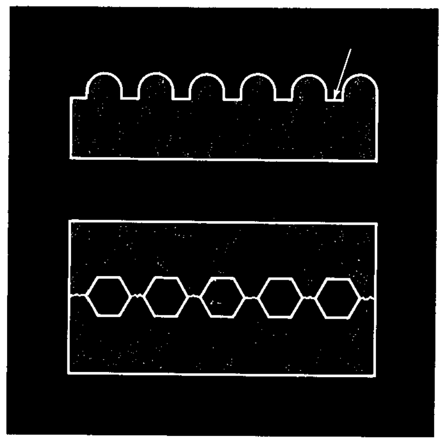
"Because of the way property is abused in a public building," says George Larsen of C. F. Murphy Associates, "it would be a good thing to use more concrete in interiors, perhaps provide concrete furniture and hoses in the ceiling so you could hose it down at night."

"In the future," SOM's Roy Allen says, "concrete architecture may come most predominantly in parking architecture."

Paul Rudolph adds, "I am under no illusion that cast-in-place concrete is ever going to be very popular for any number of buildings except garages. But I do think that precast concrete will be used for many small buildings, especially because of the economics."

Finally, Walter Netsch concludes, "If I have any guess coming, I think that people are shying away from concrete interiors simply because not everything is a high hierachy building, such as a church. A concrete environment is really kind of hard to do inside. Plastics are probably the coming things."

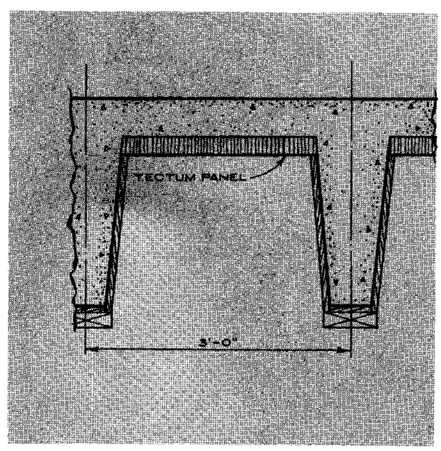


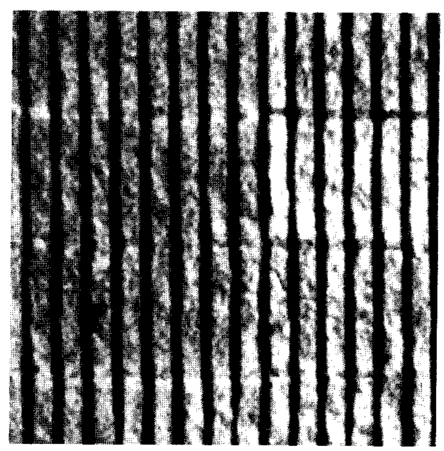


*The most recently completed building for Southeastern Massachusetts Technical Institute (SMTI), designed by Desmond & Lord and Paul Rudolph, is of cast-in-place concrete with a fluted block facing, which was also used at Rudolph's housing for the elderly in New Haven, Connecticut (top). Rudolph's interest in concrete has led him several times to investigate the potentials of cast-in-place concrete furniture, but he feels the results too often end up looking like bathroom furniture. At SMTI's first building, the stair landings overlooking a three-story well (facing page) have cast balustrades that grow into benches and tables as well. Upholstered foam rubber pads line the concrete sofas.*

*Rudolph's Creative Arts Center at Colgate University (below) is faced with a split hollow-core block, using the ragged inner surface as the finished texture (lower part of drawing left).*

*Davies, Wolf, Freeman & Flansburgh, Associated Architects, integrated Tectum acoustical panels into the casting of the concrete waffle slab of the Kennedy Junior High School in Natick, Mass. (drawing at right and photo below it). They gained, in addition to the acoustical insulation, which is also the finished ceiling, a saving in the amount of concrete in the cast slab. Squares of Tectum were simply placed on top of standard metal domes prior to the casting.*



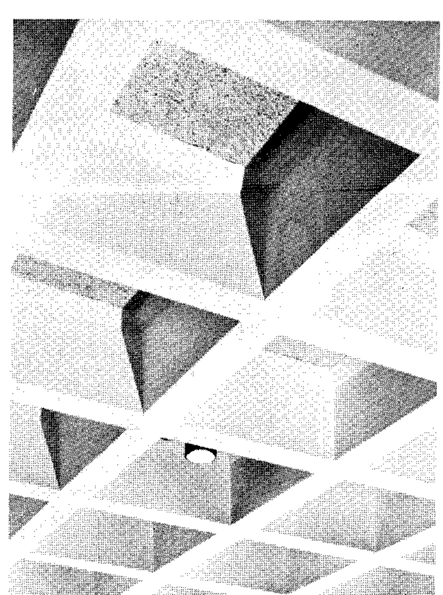


PHOTO: COURTESY, NATIONAL GYPSUM

PHOTO: DICK BROUSSARD

PHOTO: PACHECO

# EXPOSING AGGREGATES: A PRECASTING PRIMER

**Precast concrete panels do not have to crack, spall, or fall apart if they are specified, batched, and fabricated properly.**

*By A. I. Tenzer and Ray McNeal of the Building Materials Research Institute, Inc., New York City.*

Exposed-aggregate concrete panels, with their variety of colors, designs, and textures, can be counted among architecture's most versatile developments. They also create many problems in construction and disappointments in service, but this fact is less surprising than its corollary: sometimes they do not.

What makes a totally successful installation of precast exposed-aggregate so surprising is that it can only result from the most delicate coordination of design, engineering, specification, manufacturing, and erection. Problems arising at each stage of manufacture require an understanding of what went before and what will follow after; sometimes, the information on which judgments must be based is either unavailable or already buried in a batch of cured concrete.

As consultants on building materials and material problems, we may have a somewhat unstatistical view of the proportion of failures to successes. This is not only because we see more problem jobs, but because we have to look closely for problems in the making. Sometimes it takes a magnifying glass to find them. But, sad to say, we often do.

What are these problems? How do they show themselves? What are their effects? What can be done about them? Although causes vary, failures such as those shown here can usually be traced to the portland cement concrete that is used in most exposed-aggregate precast panels. Weathering and stress cracks, spalling or disintegration are most common and most dangerous, because they permit moisture penetration that causes progressive deterioration.

Or the binder may fail to hold all of the exposed aggregate, resulting in unattractive voids that also permit progressive damage. Staining and discoloration are separate problems. They may or may not be related to structural weakness, but they can hardly gladden the heart of the architect who specified exposed aggregate for its aesthetic appeal.

## Goulash Won't Do

To understand where troubles begin—and how they can be prevented—consider the structure of a typical panel and how it is affected by design, specification, quality control, and manufacturing.

*Deep etching of a weak matrix undermines small aggregate which falls out leaving dark voids shown on facing page.*

The exposed face of a precast panel is rarely "ordinary" concrete. For the sake of appearance and texture, it is usually made of selected, tightly graded—and frequently costly—aggregate mixed with clean white sand and cement, and, more often than not, with pigment or coloring agent. These expensive ingredients are not needed in the unexposed, back-up portion (some are undesirable since they weaken concrete), but for strength and durability each panel has to be a monolithic mass.

Therefore, to keep costs down and strength up, most panels are cast in two steps. First the reinforced back-up is cast with a mix formulated without regard to appearance. Then, before it can take an initial set, separately mixed concrete for the face layer is cast over it. The two layers are consolidated, usually by mechanical vibration.

The panel then has to be cured. Steam curing is commonly used because it yields an ultimate strength nearly as good as water cure, and is a great deal faster and therefore less expensive. The heat of the steam chamber speeds the initial curing action of the concrete. And the moisture-saturated environment prevents loss of water that the concrete needs for a full, high-strength cure. The panel must be kept moist for at least seven days after it is removed from the steam. This can be done either by placing it in a high-humidity chamber or by covering it with a suitable plastic membrane.

The final manufacturing step consists of exposing the surface aggregate. In one method, it is etched with solutions of hydrochloric acid. In another, the curing time is retarded by applying chemicals to the surface of the concrete mix during casting. The shallow, uncured layer can be scrubbed away after the bulk of the mix has set hard enough to be unaffected by hosing and brushing.

## Mistakes Multiply

As simple as these procedures sound, they are full of pitfalls. Precast panel problems can begin at any stage, from design onward; the earlier they start, the more chances they have to multiply along the way. And good components and systems may fail because they are are incompatible with each other.

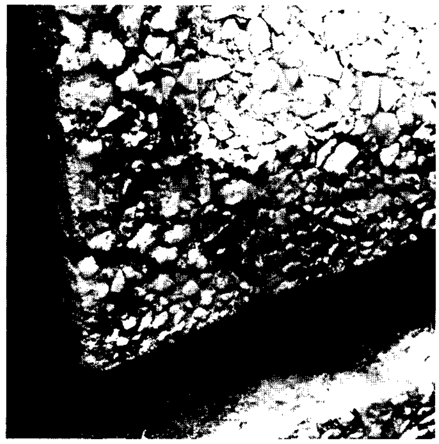
The initial design and specification of exposed-aggregate precast panels is partly architectural, partly an engineering function. Requirements of size, thickness, color, texture, strength, loading, and resistance to probable environments have to be translated into concrete-component ratios, density, air-entrainment, pigments, aggregate type, size and grading, and the size and placement of reinforcement. All of these are important to a sound and durable end product; most are critical.

The specification of concrete involves many compromises and trade-offs. Assuming that all components are of the quality and purity called for (they not always are, but we will come to that later), the design must still balance cost and appearance against tensile, flexural, and compressive strengths, density, absorption, and similar physical factors. Most of these are determined by the basic formulation—that is, the ratio of cement to total aggregate to water. Subsidiary relationships, such as fine to coarse aggregate, exposed aggregate mix to back-up mix, and all of these to pigment, air-entraining agents and chemical accelerators or retarders, if any, are almost equally important.

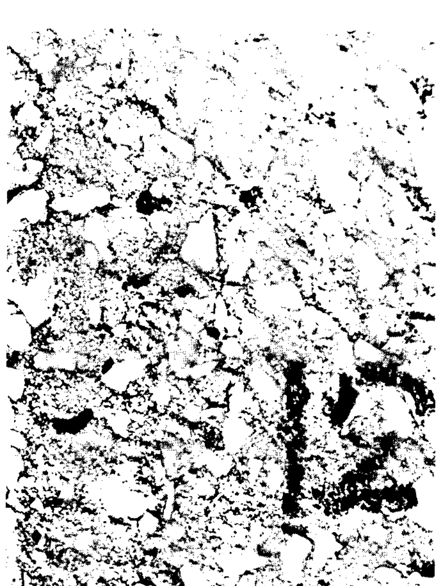
Where strength is a factor, high density is, of course, desirable. Exposed-aggregate panels are rarely loadbearing, but they have to be strong enough to withstand strains of handling and erection, settling and possible misalignment, and wind loading. Higher density also gives better resistance to weathering, disintegration, water penetration, dirt retention, and, usually, loss of exposed aggregate.

Since it is not usually practical to compound exposed concrete for total resistance to moisture penetration, the surface layer should entrain between 4 and 7 per cent of air. This makes it less vulnerable to freeze damage from water that does get in. Since air-entrainment reduces strength, the loss should be compensated for in mix design.

The same is true of pigment. It contributes nothing but color to the mortar and should therefore be calculated as part of the inert filler. Too often, it is simply added to the total without regard for the fact that it can change the over-all proportion in the direction of lower strength and poorer bonding. Some types may also react chemically with some types of cement, resulting in staining, uneven color, or early disintegration. Impurities in pigments can have similar, or worse, effects.



*Corner of panel (top) can be expected to fall off when reinforcing fabric exposed in crack oxidizes. Corner may have been cracked during installation of panel, but deepening of crack results from weathering and mortar failure. Sandy matrix (center) provides poor adhesion for aggregate, and cracks will admit water, which will freeze and widen cracks. Stress-cracking pattern (bottom) of small cracks joining large cracks, leave ½-in.-dia. voids where aggregate fell out.*



## The Stone's the Thing

To a designer of exposed-aggregate panels, the component of greatest interest, quite naturally, is the exposed aggregate. Frequently, it is also the most troublesome. Although appealing to the eye, some types of aggregate are basically unsuited for this use because they react with the alkaline in cement; in exposed faces, they tend to expand and pop out of the mortar. Some lightweight aggregates are good to look at and would seem to be desirable for minimizing panel weight. However, they should usually be avoided, because they are apt to absorb moisture which, in exposed surfaces, would promote cracking and deterioration. In time, they would probably crumble out and damage the appearance as well as the strength of the panel.

When specifying aggregate, an architect should also consider how the surface is to be exposed. If acid is to be used, it is important that the aggregate be acid-resistant. Otherwise the color (and possibly the strength) for which the stone is selected may be leached out before the panel ever gets on a wall. Even if chemical retarders are to be used for exposing the surface, it is best to specify acid-resistant aggregate. For, in steam curing, the surface mortar sometimes sets up too quickly for successful wash exposure. When this happens, acid has to be used, regardless of the manufacturing plan.

The size of coarse aggregate is as important to durability as it is to appearance. Even more important is the gradation of sizes, for whatever the design reasons for mixing small and large aggregate in an exposed face, they are more than offset by disadvantages in function. Inevitably, if the surface is etched enough to give proper exposure to large stones, small ones will scale out sooner or later. Probably sooner.

Aggregate size, in the base mix as well as the surface mix, must also be considered in relation to panel thickness. As a rule of thumb, the largest piece should be no more than one-quarter the thickness of the panel.

Size may also be governed by the need to keep reinforcing steel at least ¾ in. below the surface. In exposed-aggregate panels, this measurement should be taken from the most deeply etched valley. Some water penetration has to be expected, and, if any moisture does reach the steel, the resulting oxidation and expansion will surely cause progressive damage. So, if a safe depth cannot be maintained for reasons of design or structure, specify galvanized reinforcement and coat the ends of cut bars with a zinc chromate primer.

## No Single Cause

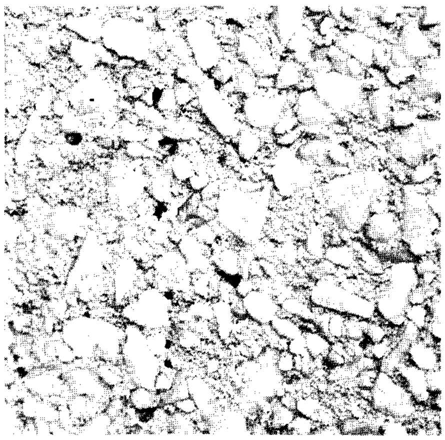
Careful, knowledgeable specification is essential to a satisfactory end product, but it is *not enough*. Everything an architect or engineer plans for in an exposed-aggregate panel can be undone by poor manufacturing techniques, or even by good techniques that are imperfectly executed.

Good manufacturing must begin with careful inspection, testing, and quality control of every batch of component materials. All aggregate—coarse, fine, exposed, and back-up—should be tested for soundness, alkaline reaction, chloride content, cleanliness, and freedom from deleterious substances and minerals. They should also be checked for size and gradations of sizes. Substandard aggregates or mixed-in impurities, as has been noted, create time-delayed problems by expanding, crumbling, reacting chemically, staining, blooming, or just weakening the concrete mass.

Batching and proportioning can also be critical. In the inspection of problem jobs, it is routine to check core samples for physical properties. Probably the most common finding is that compressive strength is far below design specification. This is probably most often due to nonuniform batching and poor placement of mixed batches in the forms. There is a natural tendency for coarser aggregate to settle to the bottom. Unless this is checked by careful batching, mixing, and slump control, it will leave strength-robbing voids in the cured concrete.

Many other factors can contribute to nonuniform, subspecification concrete:

*Water-Content Variations:* Even when water is carefully measured, calculations can be upset by rain or air moisture settling on the surface of stored aggregate. This must be allowed for; it should be recalculated each time the batching storage bin is filled from the stockpile. Moisture varies as the overnight accumulation dries out during the day and as the scoop reaches the inner, drier part of the pile. This kind of sliding-scale calculation may not defeat an engineer, but it could pose problems for the mechanic on the stockpile bucket. Such problems could be avoided, or at least minimized, by requiring that all aggregates be stored under cover.



*Deep and wide cracks (top) can lead to serious stress cracking that may buckle panels when entrapped water freezes. Small cracks (center), extending between stones, indicate insufficient adhesion of mortar. Uneven distribution of aggregate (bottom) creates weakness because there is insufficient binder around large pieces, and too much matrix at left of picture.*

*Cement:* Cement quality is not necessarily uniform. Each incoming supply batch should be tested not only to confirm freshness and quality, but also to make sure of batch-to-batch uniformity. Even slight variations in color, setting time, or processing requirements between batches mixed together can cause unpredictable results. Quality control at this point should also insure that none of the cement used is already partly hydrated.

*Consolidation:* The separate pours of surface and back-up concrete have to be mechanically tied together at the interface. This is done by vibrating the combined mass before either layer has obtained an initial set. Unless the process is carefully handled, it could bleed some of the back-up mortar to the surface. This would be no problem unless the mortars were of a different color. But they frequently are. Somewhat worse, it could settle larger aggregate to the bottom and weaken the concrete. Or it could cluster or rearrange stones that should be spread out for visual effect.

*Curing and Handling:* This should be routine, but not infrequently it is routinely bad. For a high-strength cure, concrete has to be kept thoroughly and continuously moist for at least 7 days, preferably 14. Panels should be processed at a uniform rate. It is best not to handle them at all until they have taken a good set, and then they should be handled with great care through the remaining cure cycle. Premature or rough movement can set up internal cracks or strains from which concrete can never recover. The dangers are greatest when panels are moved through cure stages, and when they are removed from their forms. Perhaps some banging is necessary at this point, but in a good shop, workmen will not seize upon form release as an excuse for letting out their aggressions.

*Exposing Surface Aggregate:* Whether exposure is accomplished by acid etching or by the retarding method (or by both, if steam-curing hardens the surface too fast for successful wash-out), it is important that the treatment not remove too much of the binder. Acids have to be applied carefully in proper strengths for controlled times or they will penetrate unevenly and too deeply. This will result in an inert binder that obviously cannot hold the aggregate. And dead cement can wash out later and invite water penetration with all the resultant damage of steel oxidation and freeze-thaw damage. Chemical retarders must be handled with equal care to insure adequate, but not excessive, binder wash-out.

*Testing Panels for Soundness:* If there are going to be any problems, it is clearly better to know about them before panels are hung on a structure. In a good quality-control procedure, test cylinders and slabs will be taken from every mix batch from which panels are cast. Before any panel is used, its matching samples should be cured for 28 days and then thoroughly tested for tensile and compressive strength, absorption, freeze-thaw stability, and other relevant properties. And, of course, the samples should be closely examined for hairline cracks, voids, discoloration, or other flaws.

## Haste Makes Waste

Care at every stage of design, manufacture, and testing can eliminate most problems of exposed-aggregate panels. But until men become infallible, they will not eliminate all. Further checks of the finished structure should therefore be made both early and periodically. For early detection and treatment of minor faults can sometimes keep larger ones from developing.

If inspection does reveal problems, it then becomes important to analyze their causes and forecast probable effects. Minor loss of aggregate may not be serious. But if stiff brushing removes a significant amount of stone and powders out the matrix, it is likely that weathering effects will be severe.

Cracks, too, have to be carefully analyzed. If there are many of them, it may be necessary to remove a panel and project its weatherability by accelerated freeze-thaw cycling. Minor hairline cracks, if there are not too many of them, can probably be checked by a sprayed or brushed-in water-repellent. This should not be attempted, however, until the future course of crack development has been projected as accurately as possible. Many surface waterproofers are based on silicones that repel not only water but most other materials as well. If cracks should open up, the silicone treatment will not only be ineffective but will prevent the adhesion of new grout or slurry that could repair the damage. Therefore, repellent surface treatment should not be used unless there is good reason for believing that serious cracks will not develop for at least three to five years. After that, the silicones will be sufficiently worn away to permit further sealing. And, in the meantime, they could afford considerable protection for both the concrete and the building.

Serious and progressive cracking present other problems that, through exposure of reinforcing steel, could affect structural soundness. Problems like these will probably require rebuilding of the matrix with carefully worked-in grouting compounds.

Polymer types of emulsion solutions have been successfully used to overcome binder and stone defects. Corrective compounds must be developed and tailored very carefully, so that their physical properties and coefficients of contraction and expansion will be similar to those of the original panels.

Regrouting or rebuilding faulty panels is cheaper than replacing them; but not much. It is so costly, in fact, that it should not be allowed to happen.

Nor does it have to happen. At least, not any more. In the earliest days of exposed aggregate, problems developed that could neither be reasonably anticipated nor fully controlled. Even today, perfection still eludes us. But enough problems and pitfalls have been identified to teach those who can learn from experience.

An architect no longer has to hesitate in recommending or designing exposed aggregate, nor need he solve all the technical problems of specification and manufacture. He should know, however, that they do exist, and that they can be solved only by technical coordination and meticulous control at every step from drawing board to scaffold.

# HOW TO SELECT EXPOSED AGGREGATES

**Means of insuring sound aggregate, with uniform color, for exposed concrete.**

*By Edward L. Friedman, an authority on concrete in architecture, and a consultant to I. M. Pei & Partners, New York City.*

The wisest advice for an architect looking for aggregate to use in exposed architectural concrete is, "Commission a geologist to do the dirty work, and select a firm familiar with the geologic character of the project area."

Before we can understand the significance of aggregates in architectural concrete, the material must be defined.

Architectural concrete is intended as an architectural surface that does not receive a subsequent coating other than a transparent, and presumably colorless, water-repellent. The concrete may be cast-in-place or precast; left as it appears out of a form, or surface-eroded to expose the aggregate by abrasive blasting, bush-hammering, high-jet water spray, or acid bath.

Obviously, the color of the aggregate grows more important with the degree of exposure of the aggregate. Only trial panels can determine the extent to which concrete color is affected by its constituent materials: brand and type of cement, and type and gradation of the fine and coarse aggregates. The crystalline structure of the aggregates also affects appearance. This depends on the erosion technique; the resulting surface texture will vary with the magnitude, direction, and frequency of strike.

Acceptable aggregate can be interpreted to mean material that is initially suitable and does not deteriorate or lose its character during a building's normal lifetime. In establishing criteria for acceptable aggregate, a careful distinction must be made between interior and exterior exposure; for instance, some aggregates do not maintain their color under prolonged weathering, or are not resistant to alternate wetting and drying or freezing and thawing cycles.

## The Color Chart

Knowing what he wants, how does an architect proceed to select specific aggregates? Obviously, if color is not a factor, then the least expensive aggregate governs. Usually, commercially produced aggregates cost the same in any area; it is the distance they must be transported to market that determines the final price, and 5¢ a ton per mile is a good rule of thumb.

But when color is a consideration, as is the case with exposed aggregate, an architect's most useful tool is the Rock Color Chart. This compendium, which is available for $5 from the Geological Society of America, 231 E. 46th Street, New York, N. Y., is based on the Munsell Color System.

The chart indicates the entire range of known rock colors, and most effectively describes fine-grained or single-tone rocks like limestones. Coarse-grained rocks, such as granites, are of variegated colors and the chart describes an amalgam of their colors.

Unlike paint colors, however, a universal color chart listing stone quarries and sand pits by representative color chip does not exist; it remains the architect's problem to locate the closest source. Therein lies the geologist's patient search. Like a bloodhound given a scent, the geologist is advised of the desired color by the architect and his investigation begins.

## Well-Informed Sources

Initially, a review is made of old and new published material on the geology of the area and its quarry industry. Some of the best sources of information are the Geodetic Survey, university geology departments, museums, departments of public works, and local geologists and quarry men. A geologist's field work may include trips to known aggregate sources to investigate color continuity, soundness, and, in the case of new sources, availability.

The final report consists of samples of the aggregates and information on the appearance, texture, mineral content, friability, soundness, uniformity, mode of occurrence, and cost, as well as recommendations for further tests. Parallel to this, an architect must determine the ability of local ready-mix suppliers to handle the material, shipping costs, and stockpiling problems.

Once all of the determinations have been made, the architect should retain a testing laboratory to design concrete mixes and prepare panels of the various potential materials, in conjunction with tests for compressive strength and workability. The panels should also be subjected to various erosion techniques to permit a final selection of material and texture, which can then be incorporated into the project specifications.

## What to Specify

When specifying aggregates, the following criteria should be included in the contract documents.

*Coarse Aggregate for Exposed Concrete*

Material: Uniformly graded, clean, hard, durable, non-alkali reactive, uncoated particles free of iron sulfide, wood fragments, dirt, soluble salts, or deleterious materials; crushed stone, gravel, slag, or screened gravel. Material shall be free of substances that change color on oxidation.

Tests:

a. ASTM C-289: Non-alkali reactive.

b. ASTM C-33:

(1) Free of deleterious materials (Table III).

(2) Maximum loss on five-cycle magnesium sulfate soundness test not to exceed 10 per cent.

Choice of Test c or d:

c. Deval Abrasion Test: Maximum loss to be 6.5 per cent.

d. Los Angeles Abrasion Test: Maximum loss to be 50 per cent.

e. The 10 per cent, 25-Cycle Sodium Chloride Solution Freeze-Thaw Test: Maximum loss not to exceed 3 per cent.

Color: Material shall emanate from the same basic source and strata throughout the work. Material must be quarried to produce a uniformly colored (or variegated) aggregate that does not change color upon weathering. Periodically, verify uniformity of rock face color.

*Fine Aggregate For Exposed Concrete*

Materials: Clean, hard, uncoated, non-alkali reactive, free of deleterious materials, soluble salts or substances that change color on oxidation; natural sand, stone screenings, or manufactured sand. Stone screenings and manufactured sand are acceptable, provided they are produced from an approved source of hard, durable rock, the surface of which is uncoated by deleterious material.

Tests:

a. ASTM C-289: Non-alkali reactive.

b. ASTM C-33:

(1) Free of deleterious materials (Table I).

(2) Maximum loss on five-cycle magnesium sulfate soundness test to be 10 per cent.

Color: Material shall emanate from the same source and strata throughout the work. During the supply span, color must confrom to an approved record sample referenced to Standard Rock Color Chart.

# BUILDING A CITY WITH KING KONG BLOCKS

A housing project rising in Montreal indicates possible directions of precast concrete construction.

Habitat '67, a housing project in Montreal, merits attention in P/A's concrete issue because it is the first practical use of concrete precast in house-size units.

Furthermore, Habitat can be viewed in two ways: first, as an advance in technology; and second, as a breakthrough in urban design. Both these viewpoints are open to dispute, to a greater or lesser degree. This is not surprising, considering the scale of the project and large amount of public money invested in it.

But before viewing Habitat through the eyes of its protagonists, it would be useful to review these unassailable facts:

Habitat comprises 158 houses with one to four bedrooms.

These houses are built with 354 precast boxes, each measuring 38½-ft long, 17½-ft wide, and 10-ft high.

The general contractor signed a $10,500,000 contract.

The owner allocated a $13,500,000 budget (without land).

Costs are rising above budgets.

Habitat is built with precast concrete boxes stacked on top of one another so that each house has a garden on part of the roof of the house beneath it. In its simplest form, the garden space is achieved by putting one rectangular box at right angles to the box below. Because these story-high boxes are stacked 12 high, with some sitting on the cantilevered halves of lower boxes, the structural engineering becomes more complex than if boxes were stacked vertically in a conventional, straight-sided, multistory building.

## THE ARCHITECT'S HABITAT

Moshe Safdie, the young architect who designed Habitat, sees the project as an urban system for housing families, where, despite its city location and multistory construction, they will have the same amenities of privacy, identity, and open space as they would have in a single-family house.

He thinks of Habitat as an inseparable advance in construction technology and town living. "It's a step toward the development of buildings systems for large-scale urban construction—both new and redevelopment. It's the beginning of a building system."

Safdie is enthusiastic but objective in his views: "Habitat is still crude, it's primitive, it's imperfect, it has a lot of things we are still learning, but it's the beginning of a system. And, as a system, it's both a three-dimensional urban pattern and a technical building system. They overlap.

"I don't think you can talk about the three-dimensional reorganization of a city without including new construction techniques, because without them it would be uneconomical. One is conditional upon the other, and is more critical in high-density construction than in single houses."

The Habitat system consists of precast, loadbearing concrete boxes, but Safdie did not start out to design a concrete project. Several years ago, when writing a thesis at McGill University, he thought of modular units installed in a multistory frame.

But he abandoned this concept because there were no suitable lightweight materials for the units: Plastics were too expensive, and steel has to be fireproofed. So, since concrete seemed to be the most practical material, Safdie decided to make the units loadbearing, because the codes required a wall that would have been ridiculously thick for a nonloadbearing unit.

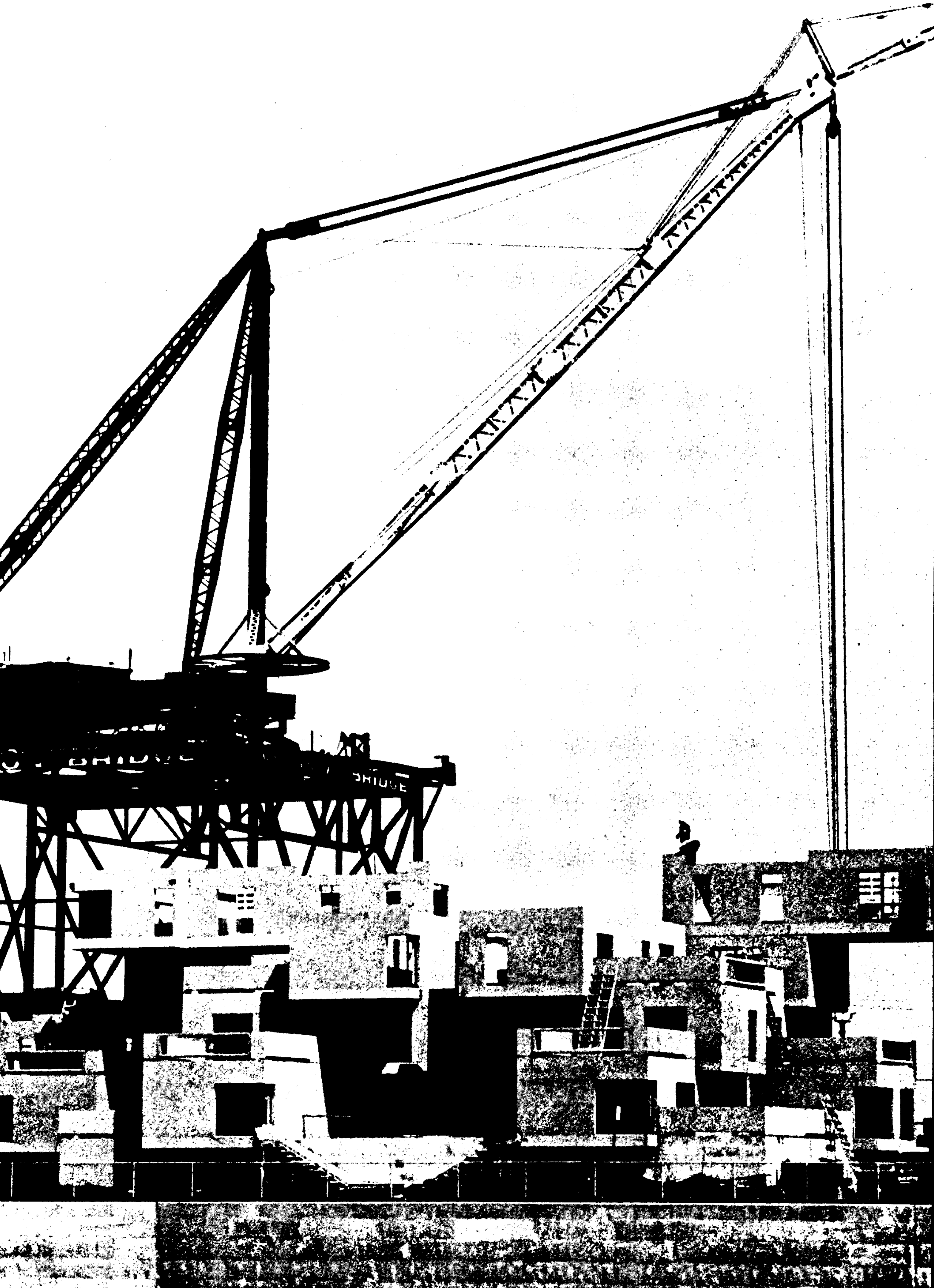
Thus frames were eliminated from the Habitat concept, and, since then, Safdie has not regretted his decision. Recently, he said, "We should try to eliminate the redundancy of a frame with plug-in units."

### Morphology Replaces Function

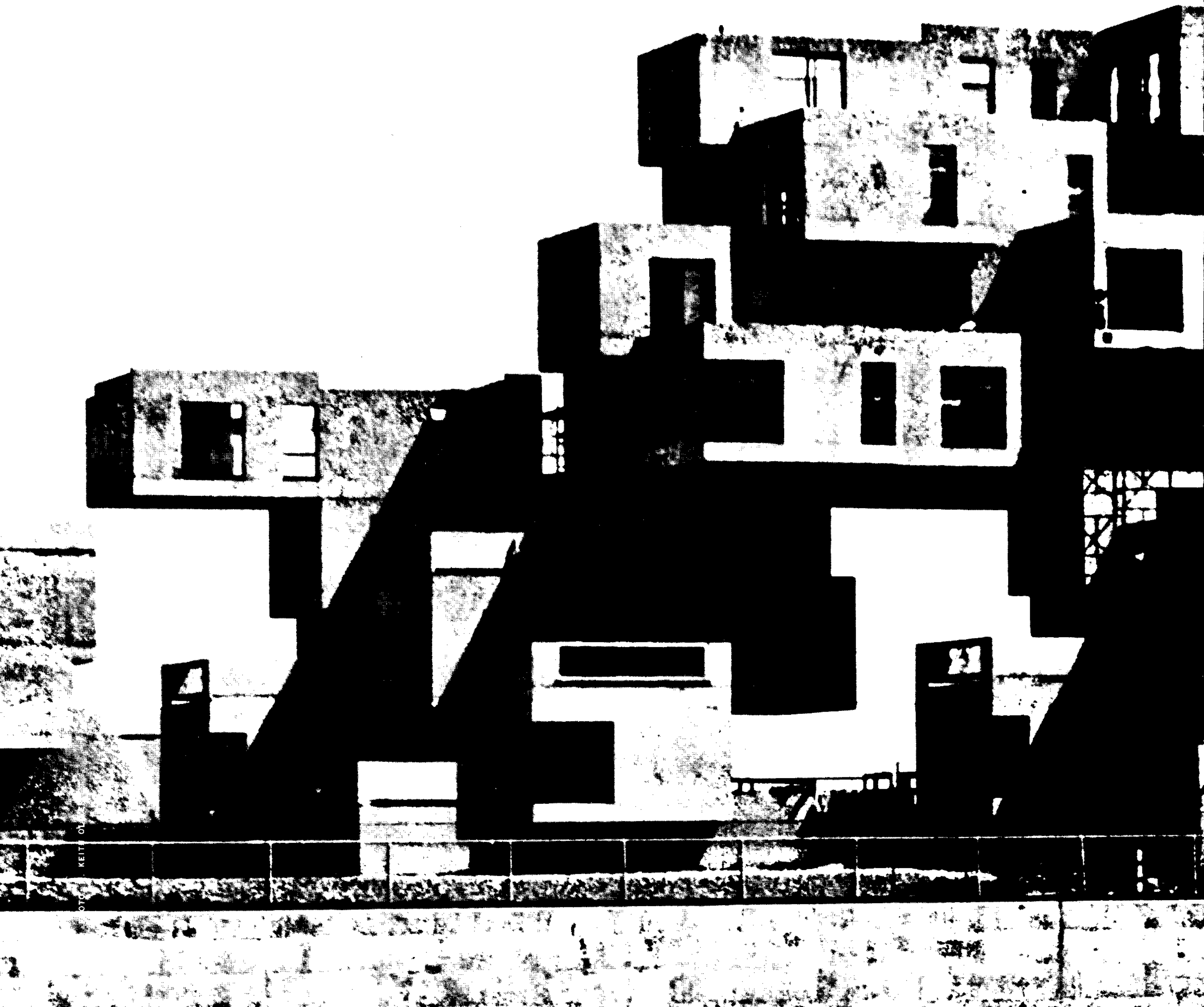
Habitat has been described as an offshoot of functionalism. Safdie comments: "I believe this approach to building goes back to the so-called functionalism of the 30's and 40's, except that they tended to look at it in a restricted way, which we don't.

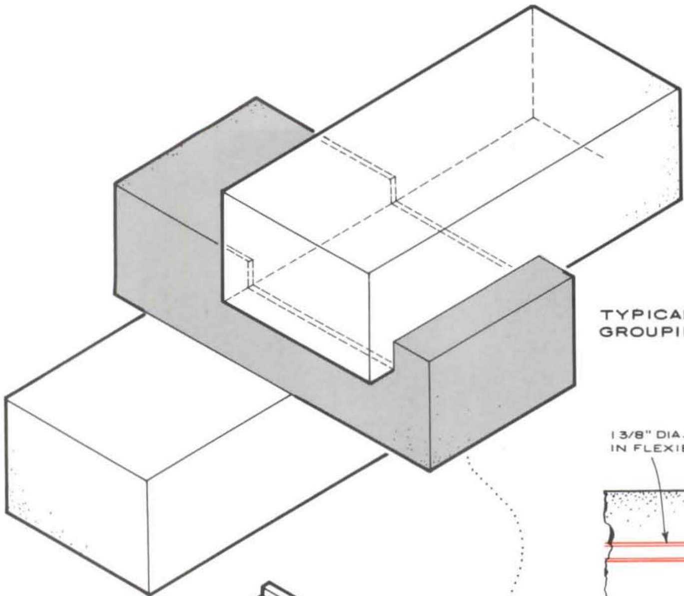
"For example, the so-called functionalism of Mies van der Rohe, where he expresses structure, is really only using steel for a frame and expressing it as a frame. But structure is more than the material holding up a building. It is concerned with all the many aspects that make up a

PHOTO: H. KEITH OLIVER

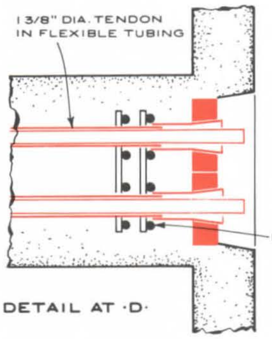


***Associated Architects:*** *Moshe Safdie & David, Barott, Boulva.* ***Structural Consultant:*** *Dr. A. E. Komendant.* ***Structural Engineers:*** *Monti, Lefebvre, Lavoie, Nadon & Associates.* ***Mechanical & Electrical Engineers:*** *Huza-Thibault, and Nicholas Fodor & Associates.* ***General Contractor:*** *Anglin-Norcross Quebec Ltd.* ***Concrete Subcontractor:*** *Francon Ltd.*

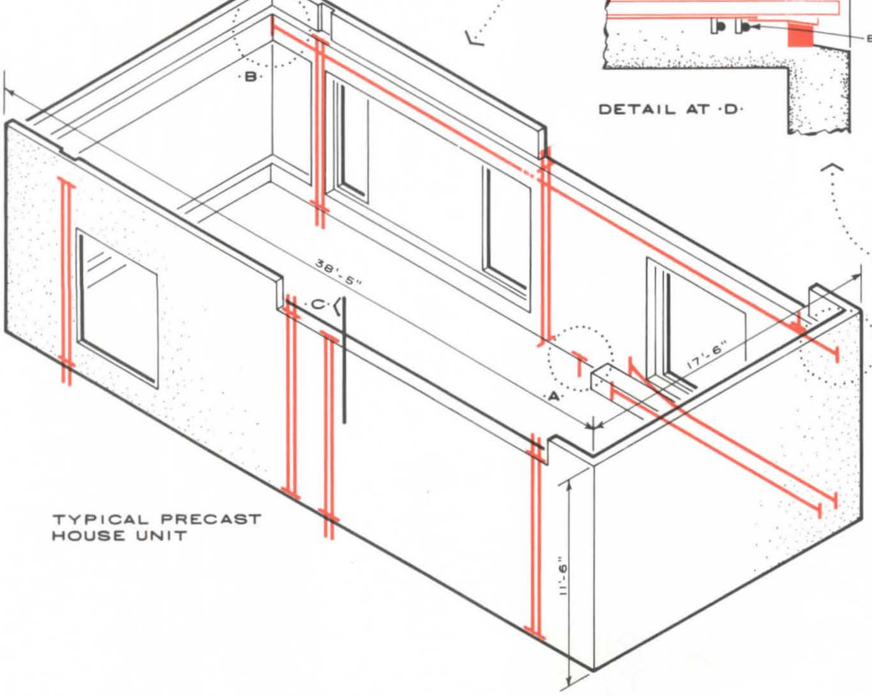




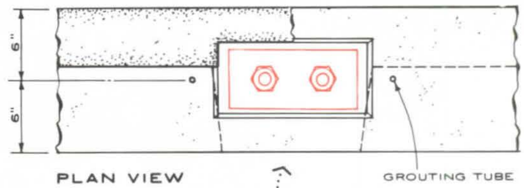
TYPICAL UNIT GROUPING



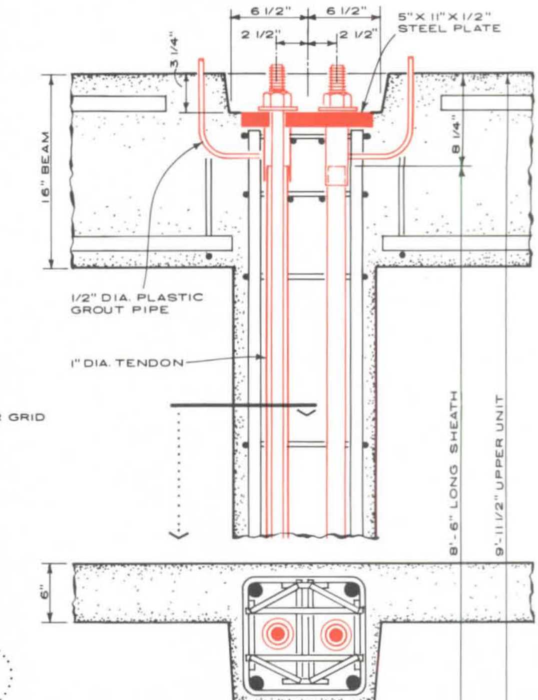

DETAIL AT ·D·



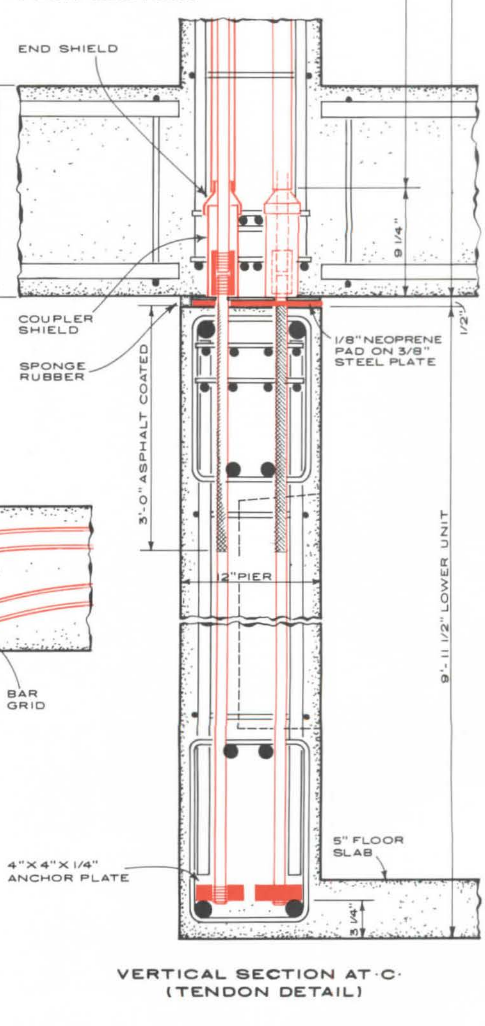

TYPICAL PRECAST HOUSE UNIT



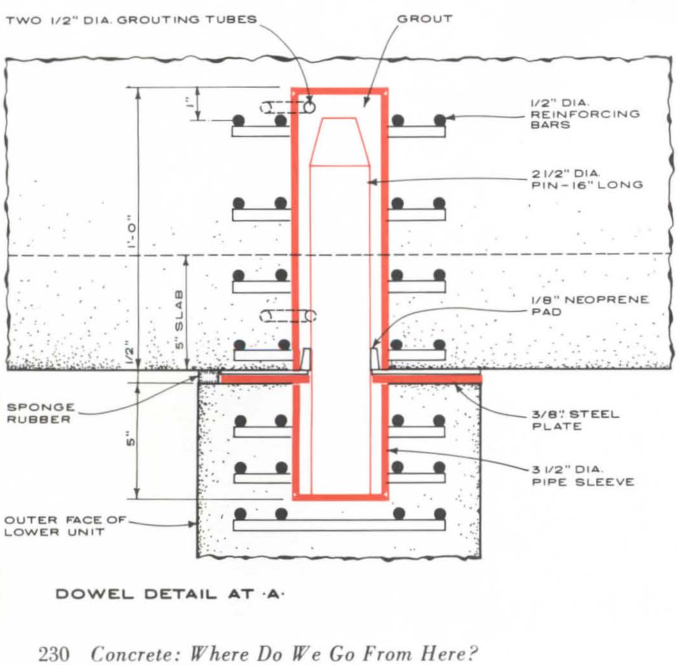

PLAN VIEW



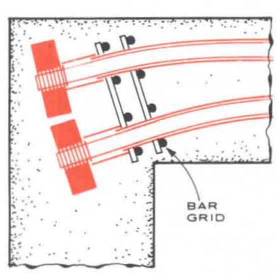

PLAN SECTION




VERTICAL SECTION AT ·C·
(TENDON DETAIL)




DOWEL DETAIL AT ·A·




DETAIL AT ·B·

building. Therefore, structure must include such things as circulation, services, sun orientation, and air movement, because each is an aspect of structure and influences the building form.

"Function is not an adequate word to describe this sense of structure. I believe morphology—the science of the evolution of form in nature—is more descriptive. What morphological forces influence the form of a building? If you explore all the forces, you start imitating the morphological process that evolves in nature, and then automatically stop looking at buildings as single entities. You have to think of cities as systems, as building systems.

"I think the Habitat system could be applied to different sites in different ways to provide varying building form and densities."

## No Corner Connections

The difference between Habitat and other precast concrete projects is in the three-dimensional form of the components. There are no wall or floor panels to be assembled at the site. The casting yard turns out five-sided boxes that are lifted on top of similar units. Only the roof slabs not covered by another box are cast separately.

Two of the reasons Safdie prefers boxes to separate panels are: They eliminate the difficulty of connecting panels at corners; and they considerably reduce the cost of site labor. Box units, he believes, should be large enough to permit rooms, including bathroom and kitchen, to be prefinished before erection. In Montreal, the rooms are to a certain extent being prefinished, and more is expected when the construction schedule shakes down.

After designing Habitat, Safdie visited the Soviet Union to see builders precasting three-dimensional units for apartment buildings. He was impressed with the techniques but depressed by the result of stacking units 12 stories high and 1000 ft long, even though these conventionally shaped buildings are cheaper than Habitat. Habitat, he repeats, "is an alternative to suburban housing, and consequently must be compared with the economics of a suburban house."

Habitat houses, to be generous about it, could be described as expensive, but in actual fact they are prohibitively costly. Safdie figures an average of $80,000 each, but others think his guess is low. He also believes the cost will diminish when more Habitats are built. This seems possible, because the cost of the prototype Quonset hut was surely more expensive to build than the thousands that rolled off the production lines in World War II.

"Costs for Habitat units are meaningless," points out Safdie. "The $10,500,000 construction budget includes the precasting plant set up for the job, the molds, mobile lifting equipment, and a specially-designed crane."

Also inflating the price is the small scale of the project. Originally, Habitat contained 1000 houses for a construction cost estimated at $42 million. The larger scheme was more than the present project multiplied by six. Its whole structural concept was different, because the large masses of boxes, stacked 10 stories higher than the present 12 stories, required the support of big A-frames that also contained the elevators and carried the free-spanning streets (see p. 211). It also included shops, library, school, and other community facilities. Lack of financing squashed the big scheme, and Safdie reluctantly drew the plans for the present 158 houses.

## Enter, Government Angel

Financing problems dogged Habitat until Safdie, like a medieval artist, found a patron. The large-scale Habitat had been planned for construction by private developers. Safdie was aware that, compared with other Montreal buildings, it could not be built economically. But the Canadian government suggested that private sponsors could enjoy tax concessions on the difference between the commercial value and the actual cost of Habitat. Two or three corporations were interested in this deal until the government decided against the tax write-off.

Behind this change of heart lies an interesting aspect of a government's attitude toward research and development. The Canadian government grants tax concessions to industries undertaking basic, approved research, and this law could have covered Habitat. Unfortunately for Habitat, the government's own department of building research is said to have vetoed Habitat as a research project because it was afraid of opening the door to any developer who wanted tax relief by trying something new on an apartment building. Eventually, however, the burden of financing Habitat was returned to the federal government, for it is indirectly paying 50 per cent of the cost.

Safdie's patron entered the scene through a momentous piece of coincidental good fortune. *Montreal* won the bid for hosting the 1967 World's Fair. This is a "real" world's fair held under the rules of the International Exhibitions Bureau. The fair, called Expo'67, decided to build Habitat and added '67 to tie it to the exhibition.

Expo gave part of a land-fill pier to Habitat. The architect is pleased with the site, which is close to the exhibition and to downtown Montreal. Habitat homes will face a wide expanse of the St. Lawrence River or nearby ships docked on the city side of the pier, with the city making an attractive backdrop. The site holds one great advantage: There is sufficient space for a large precasting plant and open space for storing completed boxes.

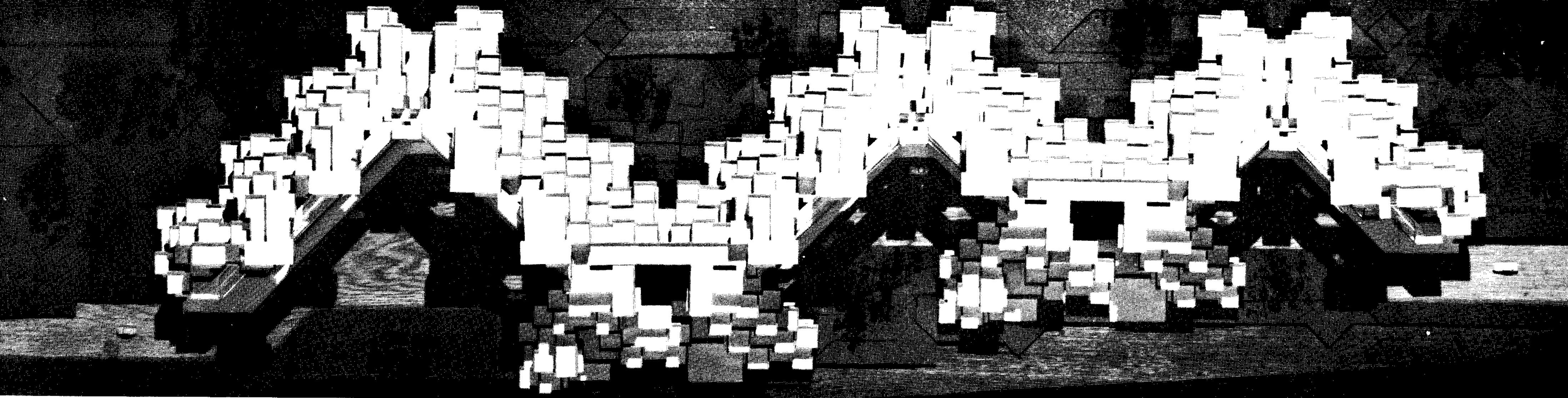
## The Multiple Master

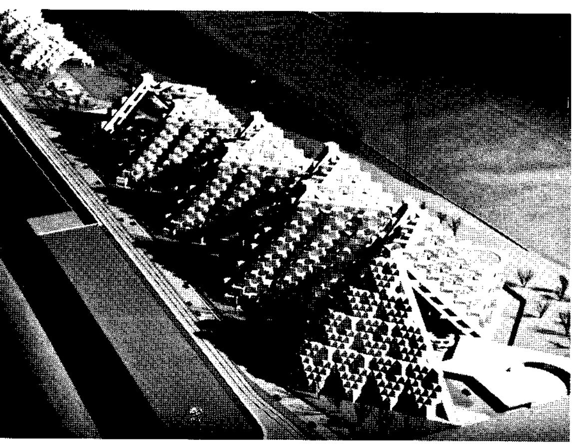
Governmental patrons are not the easiest fairy godmothers to get along with. Expo is financed by three governments: the Canadian government contributes 50 per cent; the government of Quebec, 37½ per cent; and the city of Montreal adds the remaining 12½ per cent. So Expo has three masters to serve, and often moves with the caution of a first-year intern.

With his client, the architect has to "go through channels," which are compounded by the form of construction contract. Expo, because of its government sponsorship, had to take lump-sum bids for the general contract. Safdie would have preferred a cost-plus contract, because the drawings were not completed and because the experimental nature of the job forced bidders to add a large contingency.

The company doing the concrete work, Francon Ltd., of Montreal, has a subcontract nearly three times larger than the $2 million work load of the prime contractor, Anglin-Norcross Quebec Ltd., of Montreal. (Francon's subcontract is $5,500,000; Anglin's prime contract of $10,500,000 includes mechanical and electrical work.) Therefore, when the architect wants to communicate with the company doing the major part of the work, he has to go through the offices of the general contractor. Apart from the awkwardness and waste of time, costs rise when a percentage of the subcontractor's work is added to the general contract.

Francon, the concrete subcontractor, invested a lot of money in molds and lifting equipment for the Habitat boxes. Safdie feels that the ownership of this equipment should have remained with





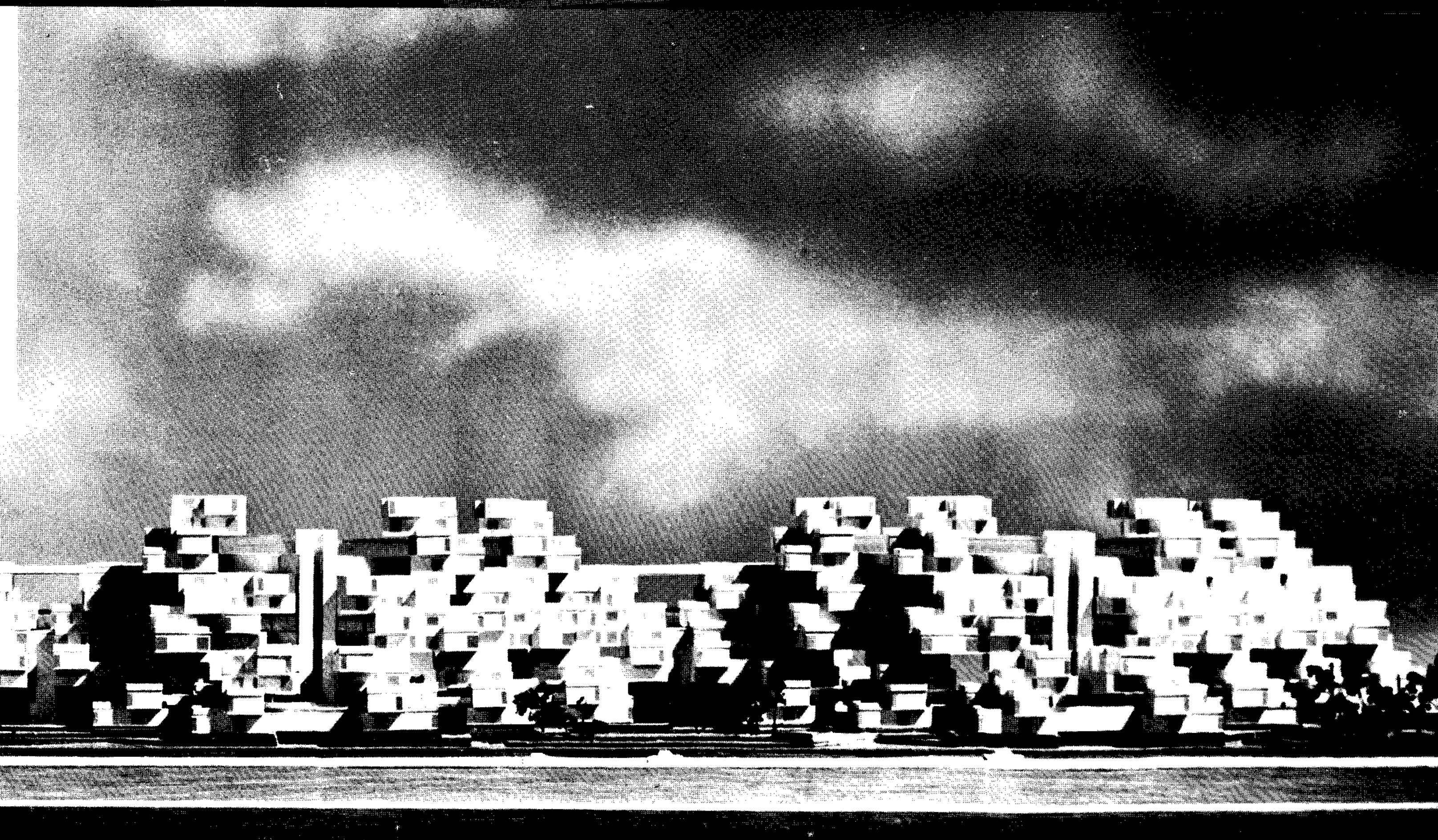


PHOTO: ARNOTT ROGERS BATTEN LTD.

Expo, for, ultimately, the government is paying for the equipment through its contract with Francon. But the specs were not written that way, so it is now up to private developers to negotiate with Francon for future construction, and the government will have no way of recouping any of its investment.

It does own the pier on which Habitat is built, and will make 40 acres available after the Expo pavilions are removed. So, if private enterprise wants to extend Habitat at the site, it will have to talk with a government agency.

The government, maintains Safdie, will encourage extending Habitat. Officials are enthusiastic about the project—now that they can see it going up. During the six months of the fair, Habitat will house foreign exhibitors, and 36 furnished houses will be displayed to the public.

But before adding to Habitat, Expo, which is a government agency, must dispose of its ownership of the existing Habitat when the world's fair closes next October. One way to do this would be to sell the houses as condominiums, for which the provincial government is now considering a bill to legislate condominium sales in Quebec.

## Plumbing Isn't Easy

Montreal relaxed its building codes to accommodate Habitat, provided that the designers could prove the soundness of their requests for variances. Concrete wall thicknesses used to be 8 in., but Habitat obtained permission for 5-in. walls on condition that they met a three-hour fire rating. It also made a major breakthrough with acceptance of a Swiss device that dispenses with conventional vents in plumbing fixtures. The "Sovent" funnels water in a way that does not create a vacuum, and therefore the fixture does not require venting.

Supplying plumbing and utility services to Habitat houses required a lot of ingenuity to meet Safdie's prefabrication demands, and overcome Montreal's perverse winter weather. All services rise in vertical trunks outside the houses. Ideally, says Safdie, he would have designed a universal connection to make a fast joint between the vertical trunk and each house, so that hot and cold water, waste pipes, and power cables could be snapped onto the underfloor distribution system of each house.

In cold fact, pipes are installed piecemeal in the trunks and separately connected to the houses. Each house is air conditioned and heated through a fan-coil unit located under a wood subfloor. Hot- and chilled-water pipes feed the unit from a central plant. These and other plumbing lines will be enclosed in insulated vertical trunks that will be washed inside with warm air to prevent pipes from freezing.

## Habitat's Safdie

Safdie is no head-in-the-clouds dreamer. Although he aspires to build housing systems with octahedral units, he was realistic enough to anticipate bad driving conditions at the Habitat construction site by buying a car advertised for its ability to travel rough, unmade roads.

He visits the site frequently, and during the early construction days he acted a little like the father of a new child: He was overanxious at first, but learned to relax as it progressed.

Safdie says, "I remember during the first few days that I was running after the fellow calking the windows, and making him re-do the work because it was sloppy. But now, the little details are eclipsed by the whole thing [Habitat].

"When the first concrete units were cast, I worried about their imperfections. But the geometry of the building is so strong that all the imperfections disappear."

The architect also is loosening his paternal grasp: "I don't think I would mind if the occupants put awnings of different colors on the houses. I don't care what people do to them. Let people use it as they want; the building stands to gain by it. It's not the kind of building that would suffer from use, from being dirty or getting stained."

## Inspecting Under Pressure

Safdie still wants a high standard of construction, and agonizes over getting it. The story is familiar to architects: An owner insists on a deadline, a contractor sacrifices quality to meet it, and an architect is stretched between them.

Each phase of Habitat's construction is closely inspected. Starting in the plant, the architect's men inspect concrete, reinforcing, casting procedures, finished concrete and erection. Despite this elaborate inspection, there is one drawback: The pressures of schedules and costs make it difficult to reject any work.

Points out Safdie, "Architectural inspection is almost useless. The pressures of scheduling are impossible. With Habitat, we have to accept the best the precaster can do, and try to help it do better. Once you have trained the crew, it is possible to get a very good finish for concrete cast in steel forms."

At the beginning of the casting program, Francon refused the guidance of Safdie's office on one particular concrete box. Inspectors pointed out that forms were not lined up, were dirty, and the reinforcing had not been cleaned. Nevertheless, Francon cast the box, and Safdie subsequently rejected it. This, not surprisingly, caused bad feelings, considering the high price of each unit.

Thinking about that contretemps, Safdie comments, "We should have stopped the work before the contractor cast the concrete. In this scale of precasting, inspection has got to be done at a stage where you can stop work before it's done poorly. And, most important, the architect and engineer must enter the discussions on formwork and procedures."

*Original project (inset, facing page) rose higher, extended further than Habitat '67 but required giant A-frame for support.*

## THE OWNER'S HABITAT

"I think that an exposition has to examine ideas that are a curious combination of the daring and the practicable. Don't think of Habitat as either low-cost housing units or high-cost housing units; think of it as a housing exhibit," say Colonel E. Churchill, Director of Installations for Expo '67.

The housing exhibit symbolizes the fair's theme, "Man and his world," says Churchill. "We were determined not to lessen the image of the exhibition by the easy and somewhat insincere way of using a meaningless vertical symbol that people realize is meaningless, and can't identify with. You may make money with such projects if you install elevators in them, but they are of no real consequence. We wanted a meaningful architectural project for the exposition symbol."

The colonel's remarks were directed at the Eiffel Tower built for the Paris exposition of 1889, and he acknowledges that the structural innovations of the tower led to the science and art of building skyscrapers. He courteously avoided any mention of symbolism at a recent, widely criticized fair.

Habitat will lead to the redevelopment of urban areas without penalizing people for inordinately high land costs, hopes Churchill. And, for Montreal in particular, he hopes Habitat will open the way to reclaiming the riverfront from industry and making it available for the public. The city has agreed to zone part of the harbor area, including the pier that Habitat is built on, for housing and light commercial use. Anticipating this, Expo built its administration building on the pier, and intends to sell it as an office building after winding up the exposition.

## The Well-Intentioned Painter

Churchill works for the Canadian Corporation for the 1967 World Exhibition, a government agency running Expo'67, which, in turn, owns Habitat. Expo administers Habitat carefully, as good bureaucrats should, and occasionally makes impulsive decisions that it repents at leisure.

Such as the time Expo agreed to let the general contractor paint the exterior walls of the concrete boxes because the contractor offered a credit for not having to carefully finish the walls or sandblast them. Painting, said the contractor, would mean a saving of 6¢ per sq ft, which totals many thousands of dollars.

Fortunately, only one wall was painted before Moshe Safdie reached the site. Then, to convince the owner that "to paint the lily . . . is wasteful and ridiculous excess," he showed him the peeling walls of a four-year-old painted concrete building.

Many aspects of Habitat are experimental, and the contractors happily admit that they are learning new tricks every day. Expo views Habitat as an experiment, and Churchill says that it permitted contractors to research prefabrication methods, techniques, and equipment. It also enabled an unprecedented approach to prefabricated bathrooms and kitchens that were expensive at Habitat but will be cheaper when mass produced.

PHOTO: H. KEITH OLIVER

*Precast planters transform one man's roof into another man's garden.*

PHOTO: H. KEITH OLIVER

*Stair and elevator towers support girders bracing building against horizontal forces.*

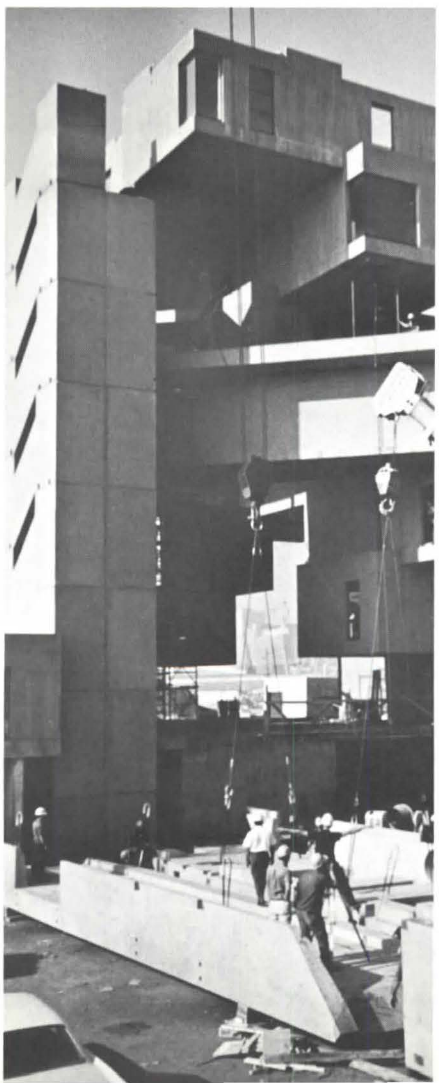


PHOTO: H. KEITH OLIVER

# THE CONTRACTORS' HABITAT

"Getting these guys to accept the notion of standardization was very difficult." The designers talking about the contractor? Wrong. These words are from the precast concrete contractor's office, and "these guys" refers to the consulting engineers.

"Fifty per cent of our battle has been convincing the consultants that the whole basis of precasting is repetition. Every time we saw details that vaguely resembled a standard, we detailed them as standards." To do this detailing, the precasting subcontractor, Francon Ltd., set up an office at the Habitat site and hired 60 men to interpret, detail, and check drawings. Precasters, like steel fabricators, customarily prepare shop drawings, but Francon far exceeds the usual ratio of drawings to shop work.

The high cost of drafting falls on the owner, Expo, which pays extra for the work, even during the days when draftsmen were idle, because the structural engineer could not produce work fast enough. Francon has engineers on its staff who spend considerable time figuring out how to translate the engineering drawings into feasible shop drawings.

During the early days of construction, Monti, Lefebvre, Lavoie, Nadon & Associates, a Montreal firm associated with Dr. August Komendant as consulting engineers, called for reinforcing steel that could not possibly be placed in the concrete. Steel totaling 6 linear inches was shown in 5-in.-thick walls. Francon suggested that some bars could be omitted and others serve two purposes: such as stirrups doubling as temperature steel, and other bars resisting shear in addition to bending moments.

## Consulting Could Cut Costs

Francon and the general contractor, Anglin-Norcross Quebec Ltd., believe that

Habitat could have been built for less if the two companies had been consulted earlier. Jim Thomson, Anglin's project manager, says the Habitat contract should have been part of a management team comprising all interests in the project. This team would have thrashed out many of the problems before construction started.

Both companies make the same observation that the engineer, architect, and owner makes: We are learning a lot from this job. Some of the newly gained knowledge concerns the limitations of time. Thomson's hope for a preconstruction management team could not work because there was no time between Expo's decision to go ahead and calling for contract bids. And, after precasting started, there was never enough time for the architect to reject any material, because the whole project revolves around a tight schedule.

## Handle Concrete Like China

Habitat's builders are pioneering in concrete technology. The sheer size of the precast units required engineers to invent handling equipment and build it for this one job. The boxes weigh 80 tons, but are subject to the same damage along the edges as a 800-lb precast spandrel panel. Says Dave Fitzgerald, Francon's project manager, "The boxes have to be handled the way you'd handle your wife's best china."

One of the handling problems arises from Francon's ability to precast boxes faster than erection crews can put them in place. Hence in June, the ground between casting plant and Habitat was covered with boxes that require double or triple handling instead of rolling straight from plant to site. These open-topped boxes are roofed by the general contractor with timber trusses enclosed with polythene tarpaulins.

Anglin's temporary roofs were clumsy and inefficient, and caused friction between architect and contractor because they leaked. In fact, the contractor had to remove all the insulation from walls and floor of one box because the material was waterlogged. Safdie thinks that a glass-fiber-reinforced plastic roof fitting over the boxes would have been efficient and perhaps cheaper in the long run.

Thomson would rather change the design of the boxes to include a concrete roof. Casting a six-sided box can be done, but not easily. Fitzgerald suggests an inflated form (and this is being experimented with at MIT) or forming the roof with the wooden subfloor raised on telescoping supports.

## Casting the Boxes

Francon casts 10 Habitat boxes every week. To meet this schedule, crews work two shifts daily on four molds. In addition to the boxes, Francon also precasts stairs, elevator towers, and massive horizontal girders that tie the structure together and serve as pedestrian streets.

The streets connect the elevator towers at fifth and ninth levels. Theoretically, they will reproduce a street system in the air, and encourage people to mix instead of traveling straight from elevator to door; practically, they reinforce the piled boxes against seismic forces in Montreal's Zone III condition.

Although the Habitat units appear to be loosely stacked, the structure is bound together with miles of prestressing tendons extending horizontally and vertically. Vertical post-tensioning holds down cantilevered boxes, and horizontal tendons support the walls of cantilevered boxes. Prestressing also enabled the engineer, August Komendant, to span street girders 112 ft between towers and support boxes with the girders.

All boxes are heavily reinforced. The steel for a complete box is fabricated in jigs before being placed in the forms. Forms, or molds as they are often called, look like invasion craft with ramped bows. However, the molds are probably sturdier than the boats, and both end walls can be winched down.

End walls hinge down into pits in the shop floor so that, after casting, the contractor can haul the box out of the mold without lifting it over a 10-ft-high wall form. Side walls hinge back about 5 ft at the top of the walls—just enough to break bond and give clearance for removing the box.

Forms for the interior faces of the walls are assembled in sections that are vibrated to help consolidate the concrete in the walls. But most of the compaction is done through internal vibrators.

Francon casts the floor slab first, then pumps concrete through ports in the wall forms to cast the wall in three lifts. Immediately a crew completes concreting a box, men cover the mold with tarpaulins and pipe in steam for about five hours. When the concrete attains 3000 psi, steam is shut off, inside forms are removed, and exterior forms are tipped back. Next, tarps

PHOTO: H. KEITH OLIVER

*Hydraulically-operated steel walls form 80-ton concrete boxes at on-site plant.*

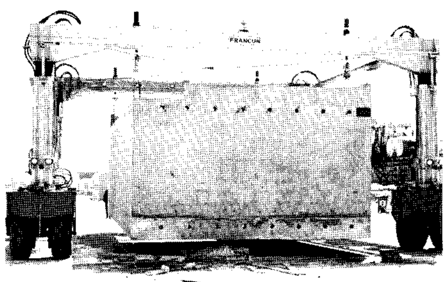


PHOTO: COURTESY OF EXPO '67

*Custom-designed lifting equipment moves precast boxes into storage yard.*

PHOTO: COURTESY OF EXPO '67

*Contractor insulates interiors under a temporary roof, then hoists boxes into place.*

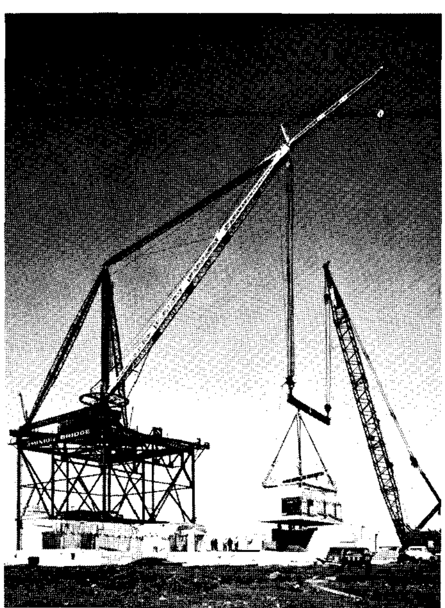


PHOTO: COURTESY OF EXPO '67

are replaced, and the concrete is steam-cured until it reaches 4000 psi. After cooling off, the concrete box is transported to the storage yard.

## Lifting Equipment

The precaster developed a special transporter for the 80-ton boxes. It consists of two steel bents mounted on wheels. Load lines from the cross beams are hooked onto the load, and hydraulic rams in each leg raise the cross beam until the load clears the ground. Francon built two of these transporters, one capable of carrying 100 tons, the other 50 tons.

Expo also entered the transporting business, and ordered a 100-ton-capacity crane that travels on a 70-ft-wide track through the center of Habitat. Expo provides the crane for the contractor to erect the boxes, which theoretically can be spotted in any location by the crane. The contractor feels that Expo's crane is not quite what it would have developed for the job, and is using the crane in conjunction with a heavy-capacity crawler crane.

By the time boxes reach the big crane, they should be prefinished. This includes sandblasting the exterior, insulating the interior, installing windows, plumbing, kitchen, and bathroom.

# EVERYMAN'S HABITAT

Montrealers not working with or for Habitat or Expo look eagerly to the opening of the fair. Some complain of the cost, but the Expo public relations staff is banging the drum and costs get lost in the general excitement.

Montreal architects critical of Habitat seem to fall in two camps in their attitude toward it. Many withheld comment in order not to prejudice their chances of an Expo commission; others observe the professional etiquette of not criticizing fellow members.

Montreal, however, is a revolutionary city, in both a political and artistic sense, and not all its inhabitants quietly accept Habitat as a solution for housing or structural innovation. As taxpayers, Montreal's professionals are appalled at Habitat houses costing nearly $100,000 each. They do not care for government support of an experiment on this scale for so little purpose.

## Orange Crates, or Equal

"Safdie may be using repetitive elements, but, my God, an orange crating system does the very same thing," says Melvin Charney, a practicing architect and director of graduate studies at the School of Architecture, University of Montreal. He reacts adversely to Habitat's stacking of boxes one upon another, like neolithic masonry, in which the lower boxes have to carry the upper boxes.

"A building system that differentiates between framing circuit and the actual housing units would have been a more sensible process to develop," says Charney.

Habitat's engineering, though highly praised by persons involved with the project, does not impress Charney, who says that the insistence on concrete as the panacea of housing has negated real innovation. "I think that Safdie's notions of what housing should be dominate the engineering of the solution. The engineering was done *ad hoc* by people who worked with projected views that were not sufficiently studied in the context of the problem. They produced building elements made to resemble components and a system."

And on the purpose of Habitat: "It does not recognize the economic or the social realities of the kind of housing it pretends to provide. It is indeed unfortunate that often an *idée fixe* is mistaken for genuine insight."

There are also many men who envy 28-year-old Safdie for being the designer of such a large project at a comparatively young age. Their criticism is tinged with complaints of Safdie the entrepreneur who bulldozed the exposition authorities into building Habitat.

## So Much For So Few

American visitors admire Habitat, and usually say they are glad it is being built. However, they admit their eagerness would wane if they were taxpayers. A professor from Harvard spoke enthusiastically about Habitat after visiting the site, but privately thinks it immoral to concentrate so much talent and time for housing so few at such great cost.

The site is not every Montrealer's cup of tea. Mackay Pier will contain Habitat, some new office buildings, and maybe more Habitat-type structures—a combination that seems to preclude the friendly, corner delicatessen or bar and grill that makes a neighborhood habitable by Jane Jacobs' standards. Looking at the pier now, observers suggest that, at night, when the offices at the landward end of the pier are closed, it will be a lonely, sinister walk from public transport to Habitat.

Within the site, Habitat's concrete boxes cantilevering one from another create a feeling of excitement not found with vertical-walled structures. On the debit side, observers say that such a configuration belongs on the side of a mountain, and that Habitat built on flat ground is comparable to building split-levels on level sites.

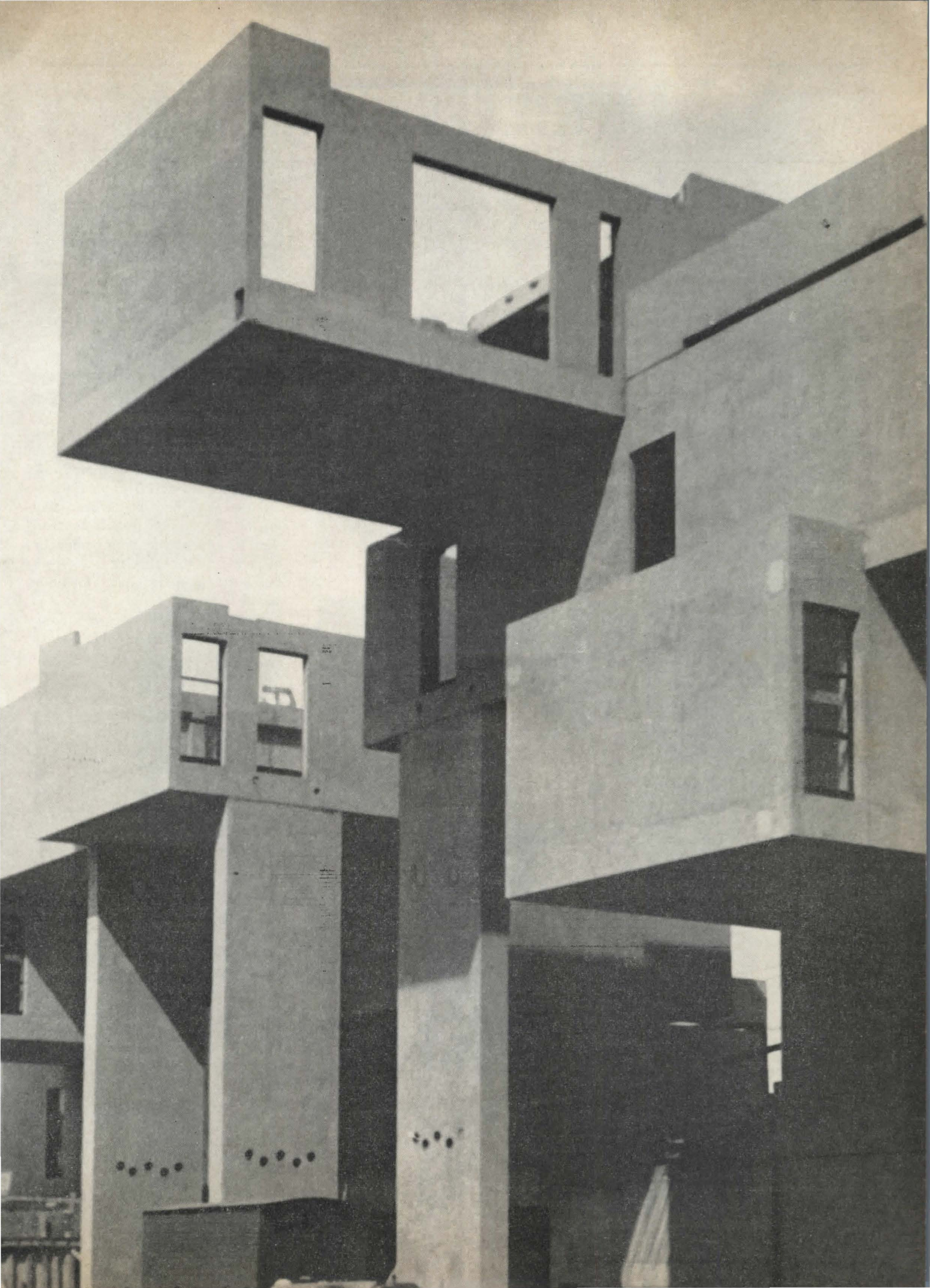
## This Above All: To Thine Own Self Be True

When Expo first took up the ball and began to run with Habitat, the Canadian steel industry tried to intercept the move. To do this, the industry hired an architectural and an engineering consultant to study the project with a view to saving the country money by substituting steel for concrete.

One consultant thought that middle-income Canadians would not approve the 'New Brutalism' of Habitat, especially the exposed services. He said that for the same cost as concrete, the boxes could be framed with steel and enclosed with concrete sprayed on metal lath. This would lighten the dead load and provide better service connections.

The other consultant concluded that the housing units would best be built with concrete because that is how the designer conceived them. "There is a penalty on a material when it is treated as a pure substitution, and its own particular characteristics ignored."

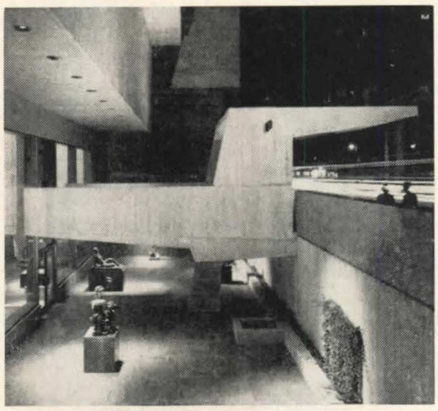
Which, after all, is what this issue of P/A has all been about.



# WHITNEY OPENS

The new Whitney Museum of American Art would be very easy to dismiss in flip newsmagazine terms. It has a front façade like an inverted Sakkaran stepped pyramid; its entrance canopy has a profile like a duck; its beetle-browed windows are seemingly capricious and solely for effect. There will inevitably be those superficial souls who will label it the square Guggenheim.

Actually, the building is more often a success than not. Marcel Breuer (with Hamilton P. Smith as associate architect and Michael H. Irving as consulting architect) has taken one of the most thankless sites possible—a corner lot in New York's middle East Side grid pattern—and attempted to do something with it. Not just for the fun of it, either. He felt, and rightly, that an art museum is not just another building along the avenue, but one that should have a particular distinction, one that should announce its individuality by means of its visual presence. This the Whitney does, not only with its unique silhouette, but also by means of an open sculpture court a floor below grade on Madison Avenue, by its stately cladding of warm gray granite, and by its glimpses of gallery life afforded through the jutting windows. Breuer states that the advancing floors of the Madison Avenue front are not whimsey on his part, but a means of providing the sheltered courtyard on the lowest level and housing larger galleries on the upper floors. He feels that the effect of the overhanging elements is to "receive the visitor before he actually enters the interior of the building."

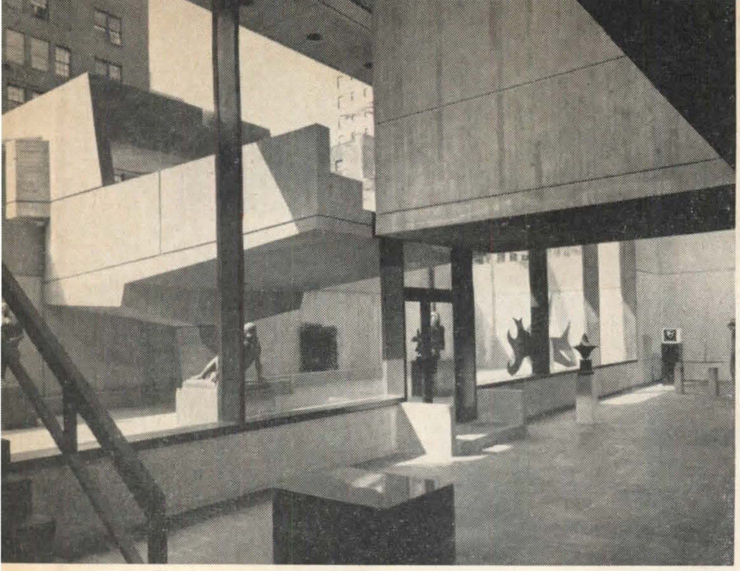


Photos: Ezra Stoller

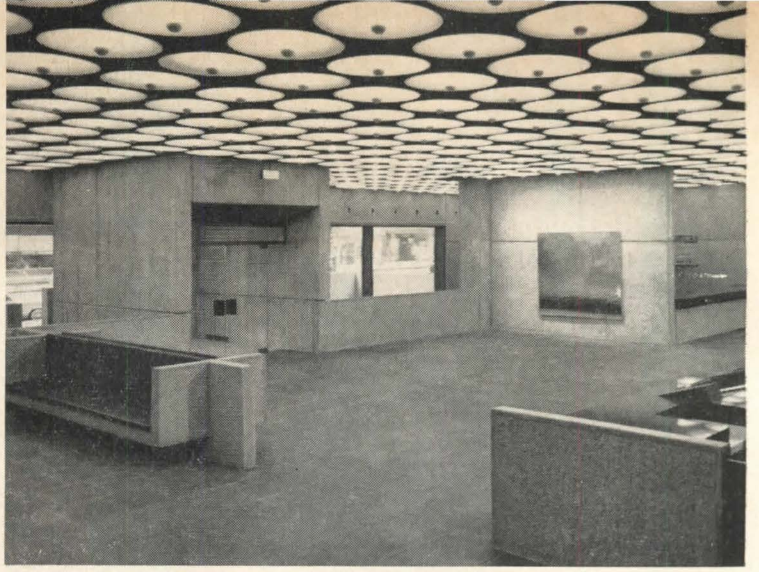
This observer is not very happy about the way the architect turned the corner on this building. The side on 75th Street appears stark and rather naked in comparison to the main façade, despite the presence of the sculptural window shapes. Of course, space would not permit the building's being a *real* inverted ziggurat—that is, stepping out on all four sides. But the designers might have considered introducing some visual connection with the front, such as heavy scoring of the stone at each break in the advancing prow.

On entering the museum by a concrete bridge over the sculpture court, the visitor comes into a lobby containing an information desk, sales counters, cloakroom, and waiting spaces. A very busy ceiling lighting system of bare silvered bulbs in circular white pans is a distracting element here. The materials otherwise are rich and muted: granite, wood, bronze, leather. On this floor, there is a gallery intended for "happenings" and exhibitions of an experimental nature.

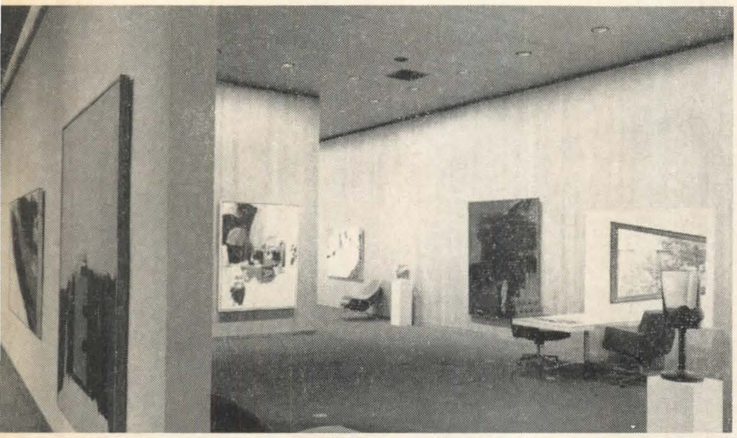
The three gallery floors above, which increase in length and height



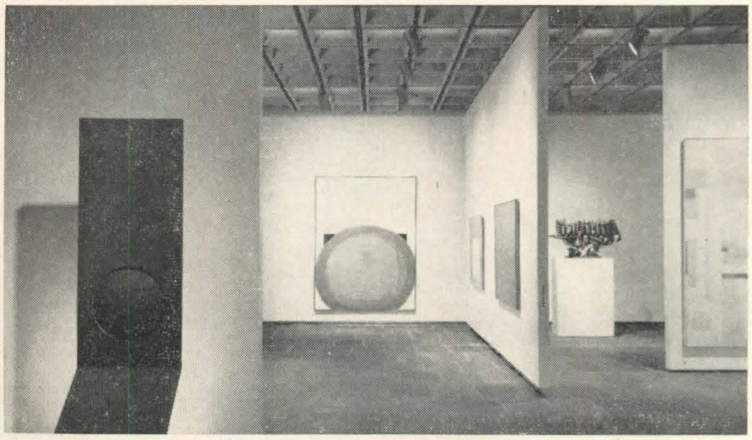
*Sculpture court and entrance bridge.*



*Lobby.*

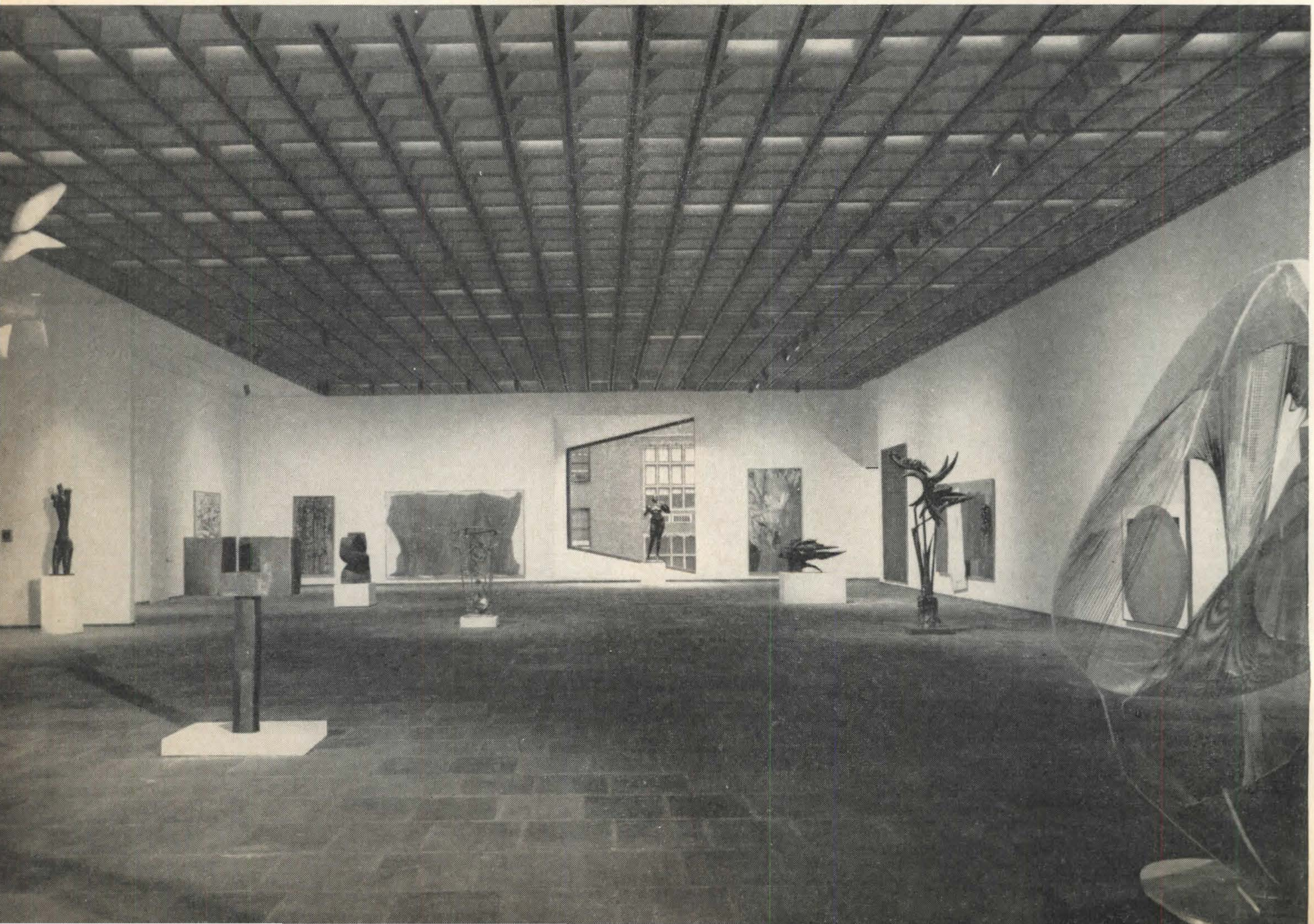


*Small, permanent gallery.*



*Partitioning system installed.*

*Largest gallery before panel installation.*

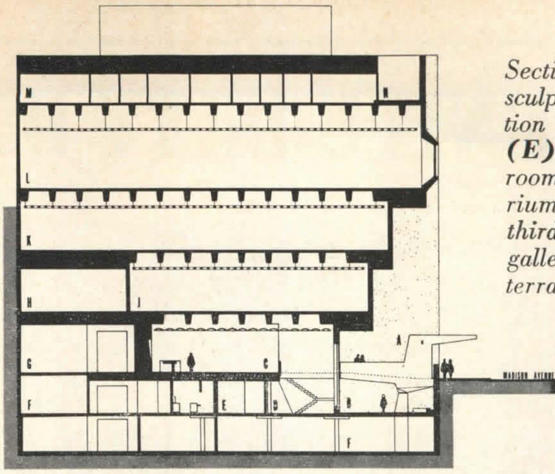


as the museum rises, contain two types of space: smaller rooms for permanent exhibitions on the 75th Street side, and huge open galleries for changing shows. A flexible system of tall panels was developed to fit into the grid of the suspended ceiling of precast concrete pan modules. Outlets for special floodlights and spotlights are integrated into this system.

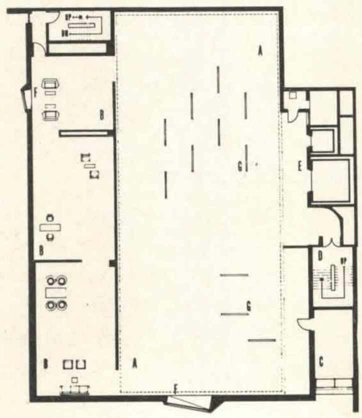
Here, in the galleries, the museum comes into its own. There is no decoratorish foolishness here as at the Huntington Hartford Gallery of Modern Art. This is a working museum that, in the gallery spaces, subordinates the architecture to the art. Breuer's palette—split slate floors, white walls and panels, light gray concrete ceiling—provides a strong but subdued background for the exhibitions. A different atmosphere is achieved in the permanent galleries, where carpeting, woven wall coverings, and comfortable furniture give a more intimate feeling. The museum offices are on the top floor, concealed behind a granite parapet formed by the continuation of the west and north walls. The structure is separated from its neighbors by stair cores and roof-high, granite-clad walls.

The Whitney is the latest in a series of sculptural buildings by the Breuer office. Breuer states that he made "an attempt to form the building itself as a sculpture. However," he adds, "a sculpture with rather serious functional requirements"—those of housing a public museum. If he has been rather more successful with the function than with the sculpture in the opinion of this observer, that is not to denigrate a commendable attempt to make a forceful and individual design statement for an important cultural repository.—JTB

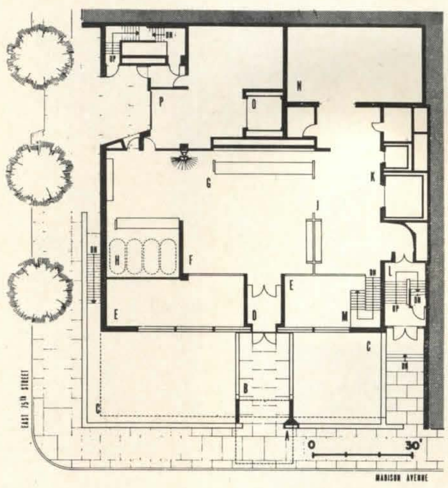
***Architect:*** *Marcel Breuer.* ***Associate Architect:*** *Hamilton P. Smith.* ***Consulting Architect:*** *Michael H. Irving.* ***Structural Engineer:*** *Paul Weidlinger.* ***Mechanical Engineer:*** *Werner, Jensen & Korst.* ***Lighting Consultant:*** *Edison Price.* ***Interior Consultants:*** *Ford & Earl Design Associates.* ***Graphics:*** *Architectural Graphics.* ***Portable Walls:*** *U.S. Plywood.* ***Builder:*** *HRH Construction Co.*



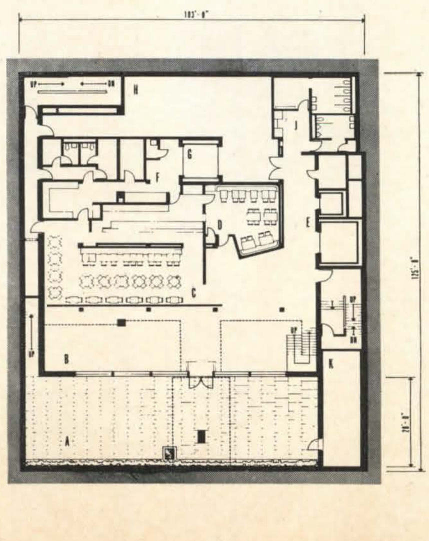
*Section:* ***(A)*** *entrance bridge;* ***(B)*** *sculpture court;* ***(C)*** *lobby and exhibition space;* ***(D)*** *sculpture gallery;* ***(E)*** *cafeteria;* ***(F)*** *painting storage room;* ***(G)*** *truck dock;* ***(H)*** *auditorium;* ***(J)*** *second-floor gallery;* ***(K)*** *third-floor gallery;* ***(L)*** *fourth-floor gallery;* ***(M)*** *office floor;* ***(N)*** *roof terrace.*



*Fourth-floor gallery:* ***(A)*** *flexible gallery space;* ***(B)*** *permanent gallery room;* ***(C)*** *restoration lab;* ***(D)*** *staircase connecting gallery floors;* ***(E)*** *elevators;* ***(F)*** *eyebrow windows;* ***(G)*** *movable partitions.*



*Ground floor:* ***(A)*** *exhibit announcements;* ***(B)*** *entrance bridge;* ***(C)*** *sculpture court;* ***(D)*** *vestibule;* ***(E)*** *open to sculpture gallery below;* ***(F)*** *lobby and exhibition space;* ***(G)*** *information and sales desk;* ***(H)*** *cloakroom;* ***(J)*** *entrance control;* ***(K)*** *elevators;* ***(L)*** *stair to gallery floors;* ***(M)*** *open stair down to sculpture gallery;* ***(N)*** *gallery;* ***(O)*** *freight elevator;* ***(P)*** *truck dock.*



*Lower floor:* ***(A)*** *sculpture court;* ***(B)*** *sculpture gallery;* ***(C)*** *cafeteria;* ***(D)*** *Friends' lounge;* ***(E)*** *elevators;* ***(F)*** *kitchen and staff area;* ***(G)*** *freight elevator;* ***(H)*** *sculpture storage;* ***(J)*** *public rest rooms;* ***(K)*** *storage.*

# FOCUSING UNIVERSITY DEVELOPMENT

The unspoken controversy concerning open versus tight campus planning continues with almost weekly announcements of new plans from all over the country. Currently, the advocates of the tightly-knit plan seem to be in ascendance, with even some of the new California campuses beginning to pull in their belts.

When the architect or planner is handed the job of creating an entirely new campus, he is free, within the limits of the program, to follow either the tight or open approach. The question of developing a plan for an existing campus presents more stringent problems, however, including the necessity of respecting the buildings that are already there, and coming up with an over-all plan that will provide the desired new facilities and integrate them with the older plan in a manner that is, hopefully, a model of convenience and good design.

Such were the problems facing Don M. Hisaka & Associates and Sasaki, Dawson, DeMay Associates, Inc., when they were commissioned to develop the master plan for 56-year-old Kent State University in Kent, Ohio. The school has a pleasant group of older buildings at the northwest section of its 800-acre site, but more recent additions have tended to straggle out in an unplanned manner. Using the 10-minute-between-class period as the longest time-distance between one point of the replanned campus and any other (except for housing, playing fields, and other non-classday facilities), the designers proposed creation of a new University Center southeast of the old portion of the campus. This center would focus academic life on the geographical and activity center of the campus. A new tower Library and a broad, low Student Union would bound a wide plaza rather reminiscent of the main square in Siena, Italy. This would be the first experience of visitors with the university after passing through an arrival court from the entrance boulevard leading from a new expressway at the south of the campus. From this urban space, linkage to the existing campus and to future elements would be by pedestrian "streets," along which would be located new academic buildings. A new Science Center would be developed adjacent to the University Center, illustrating the enshrinement of science as the Big Discipline On Campus these days. The plan has the ability of being organically extended along these pedestrian malls as future needs require. (The current plan is based on estimated needs of 24,000 students in 1973, but has built-in provisions for a larger number in 10 to 20 years, such as a traffic pattern separating walker and auto and a system of parking-garages and fields.)

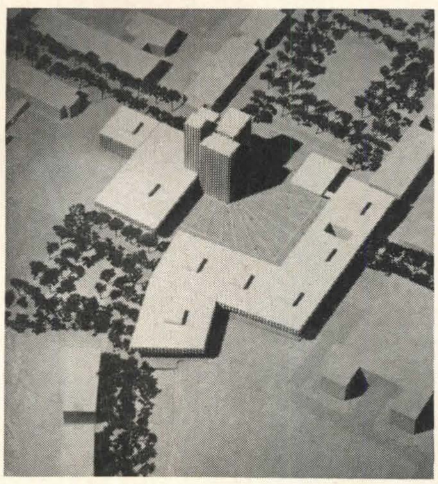
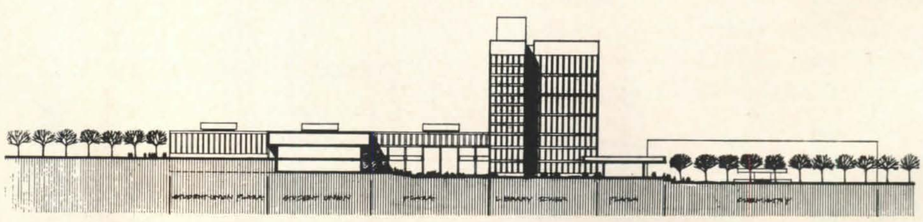


Photo: Thom Abel

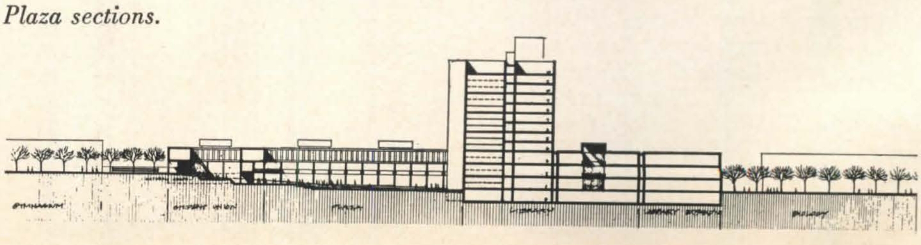
Continuing south of the new center, the architects propose three clusters of student housing atop three small hills. These units would be high- and low-rise buildings grouped around courts, with the rolling land between them left in its handsome natural state. Married student housing would be to the west of the entrance boulevard; there it would tie in with the city's residential section at the western boundary of the university.

The school's present clogged and inefficient system of roadways and entrances would be relieved by the new entrance coming in from the proposed expressway, and by creation of a loop road to take traffic around the campus and out of the way of pedestrians. Only one major road would penetrate the campus proper, for maintenance and deliveries.

The Kent State plan seems, on paper, to provide a judicious "tightness," while at the same time allowing some open-endedness for future expansion. The connection with "Quarter Circle," the older campus, appears respectful but companionable. The determination of the designers to disturb the natural shape of the terrain as little as possible and to leave a seemly amount of open land should create some very pleasant groves of Academe in the Western Reserve.



*Plaza sections.*




QUARTER CIRCLE
EASTWAY MALL
CENTRAL PLAZA
ARRIVAL COURT
SCIENCE MALL
SOUTH ENTRANCE BOULEVARD
SINGLE STUDENT HOUSING
MARRIED STUDENT HOUSING
LOOP ROAD
GOLF COURSE
NEW EXPRESSWAY RTE. 261
N
0
500'

# CHICAGO CIVIC CENTER:
## DIGNITY AND CONTINUITY

The modernization of Chicago's Loop proceeds apace with the full-time occupation of the huge brown Chicago Civic Center. Situated across Washington Street from the new Brunswick Building (see pp. 194-197, AUGUST 1966 P/A), the center contains 119 courtrooms and hearing rooms for the Circuit Court of Cook County, two courtrooms for the Supreme Court and the Appellate Court of Illinois, related office space, and badly needed space for the City of Chicago and Cook County.

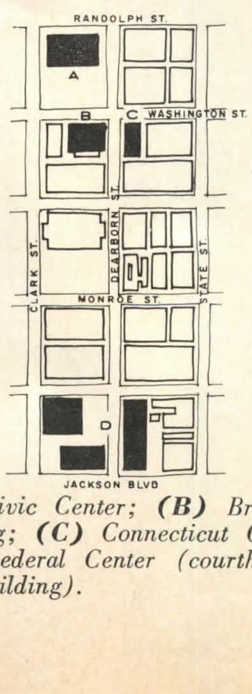
During preliminary design studies, the architects considered plans with two or three buildings arranged on the site, but eventually decided on the single, 31-story building as most economical and most convenient in containing all judicial functions in one envelope. This permitted the creation of a vast granite plaza on the south side of the building, one that has been criticized as too large and too devoid of planned incident.

Photos, except as noted: Hube Henry, Hedrich-Blessing

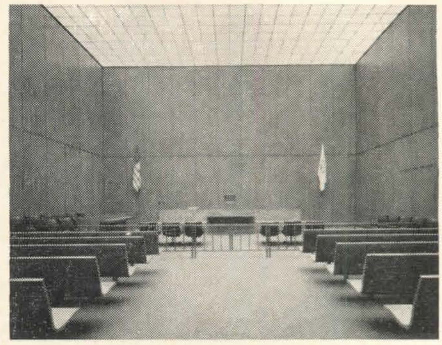
Desirable as open space is in congested mid-city, there evidently can be too much of a good thing, particularly in an area known for the severity of its windy winters. The smaller-scaled, more sheltered courts provided at the Brunswick Building and the Connecticut Mutual Building will no doubt prove more appropriate for Chicago. (As we go to press, it is announced that Picasso has given a design for a 50′-high plaza sculpture.)

In accommodating rooms and offices of varying shapes, sizes, and uses within what *appears* to be a straightforward Miesian office building, the architects found that a 4′-10″ x 9′-8″ module would perform best for most circumstances. An over-all ceiling height of 11′-10″, dictated by the space required over the elevated judge's bench in a typical courtroom, was used; in the large motions courts, this was extended through two stories, affording a 26-ft height. For simplicity in circulation, separation of public and official traffic, and control of ventilation and artificial light, all courtrooms, jury rooms, and attorney conference rooms are on the interior; judges' chambers command sweeping views of the city from the east and west ends of the center.

If the thought that this building bears a kissing-cousin relationship to the Federal Center three blocks south on Dearborn Street occurs to many observers, it is not surprising to learn that the Supervising Architect on the Chicago Civic Center—C. F. Murphy Associates—was associated with Mies van der Rohe, Schmidt, Garden & Erikson, and A. Epstein & Sons on the Federal project. The kinship of the finely detailed, subdued exteriors (Cor-Ten steel and bronze-tinted windows for the civic center, flat-black painted steel columns and bronzed glazing and spandrels in the Federal Center) and their spacious open areas is readily




***(A)** Civic Center; **(B)** Brunswick Building; **(C)** Connecticut General; **(D)** Federal Center (courthouse is long building).*



*Civic Center Court.*

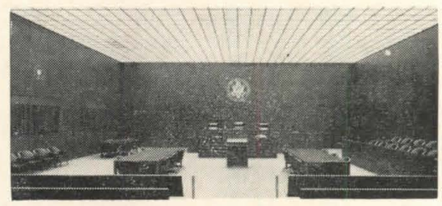


Photo: Balthazar Korab

*Federal Center Court.*

apparent, but when one moves inside to the courtrooms, the resemblance becomes positively uncanny. One can easily imagine a confused litigant waking up dazedly in the wrong courthouse, plaintively bleating, "Where am I?" This is not to say that the interiors of the center are not impressively handsome in a rather aloof way. The meticulous detailing of furniture and fixtures and the expert handling of good materials—oak, granite, wool carpeting, white plaster, terrazzo, bronze hardware—show that the Miesian tradition is alive and well in Chicago.

Structurally, the building is a steel skeleton that has columns of flanged cruciform sections built up from plates by welding. These vary in size according to the building load: up to the tenth floor they are 5 ft over-all; from the tenth to the eighteenth, they are 4 ft; from the eighteenth to the twenty-sixth, 3 ft; and from the twenty-sixth to the roof, 2 ft. This diminution as the building rises can be seen in the exterior profile of the columns. Trusses supporting typical floors are 5′-4″ deep. They are all-welded and support a 5¼-in. concrete slab, being designed with a double row of steel studs on the flange of the top truss chord to furnish composite action with the slab.


Photo: Warren Meyer

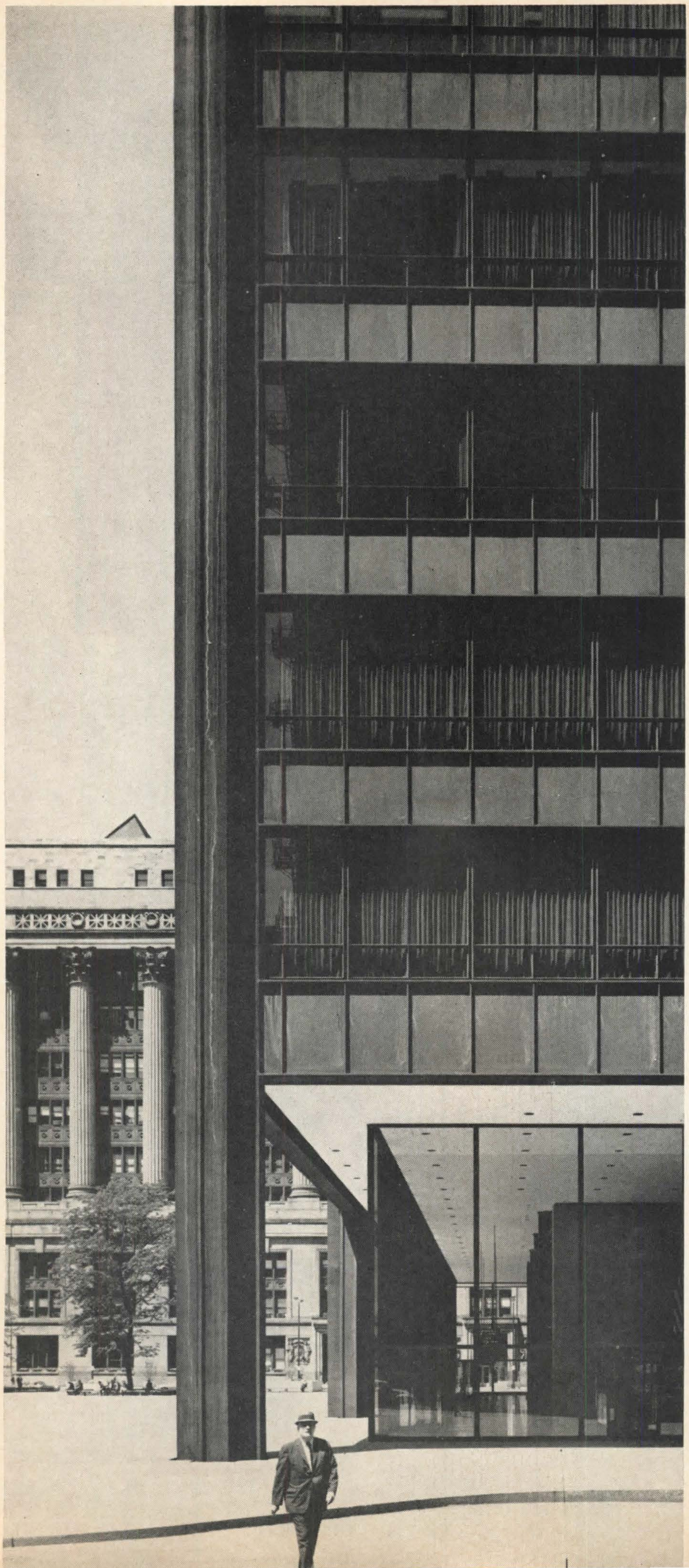
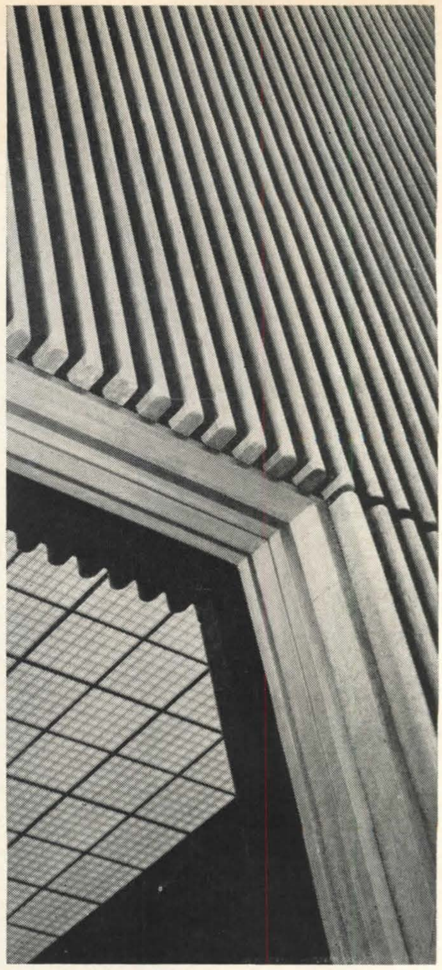
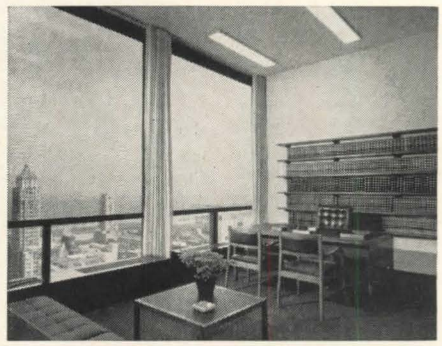


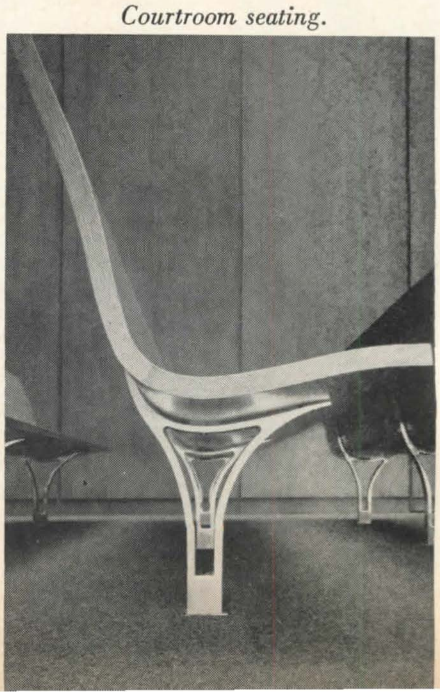
Photo: Balthazar Korab



*Ceiling-wall detail, courtroom.*



*Courtroom seating.*

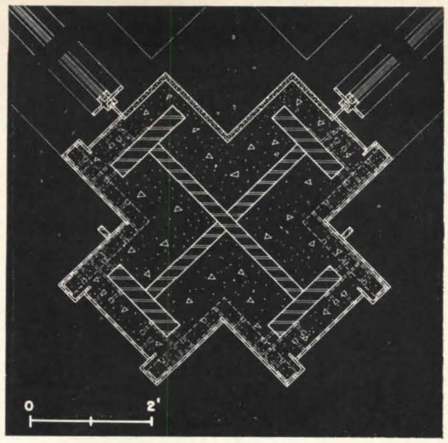


Bracing is furnished by the core area of the building. Structural steel is A441 steel for the columns and base plates, and A36 steel for other members. The fireproofed exterior is cladded with Cor-Ten steel, which will become dark brown-black.

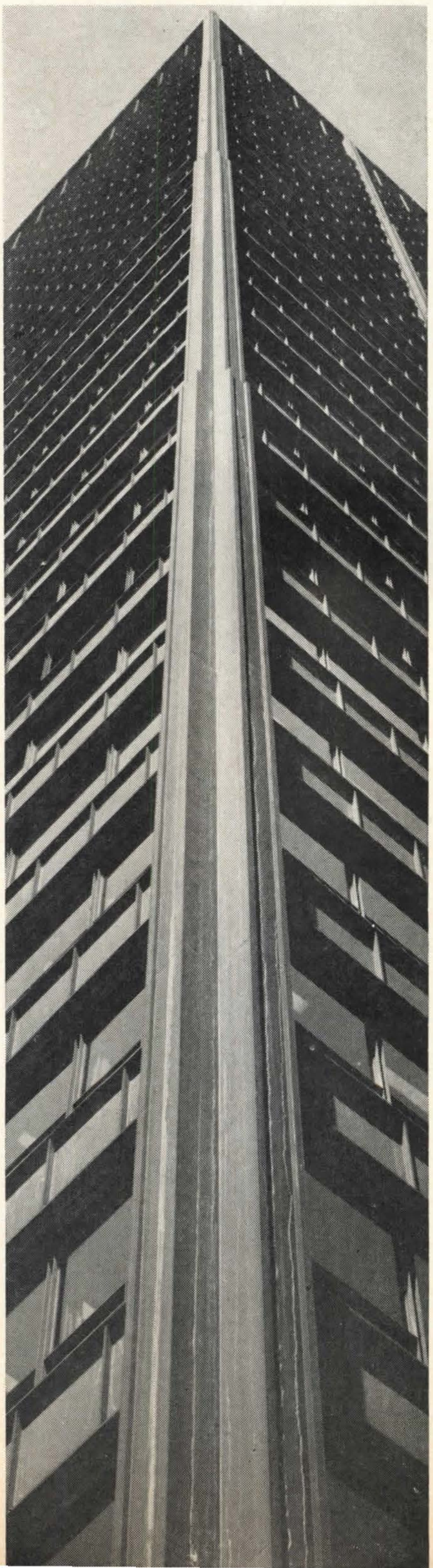
Mechanical equipment is distributed in three zones: The lowest level has three boilers and four heavy refrigeration machines; at the nine floor is located air-handling equipment servicing areas from the sub-plaza levels to the nineteenth floor; equipment serving areas from the nineteenth floor up is located on the thirty-first floor, as is a nine-cell cooling tower. Cooling units 8′-8″ long, 1′-4″ wide, and 1′-2″ high, and delivering 9200 Btuh, were developed for the offices. Other specially designed or manufactured equipment includes an air-handling light-fixture with a saddle-shaped air-distribution system fitting over the light box; lighting systems for the courtrooms combining fluorescent and incandescent fixtures; new bronze-tinted glass; and window frames specially shaped in section that were hot-rolled from Cor-Ten.

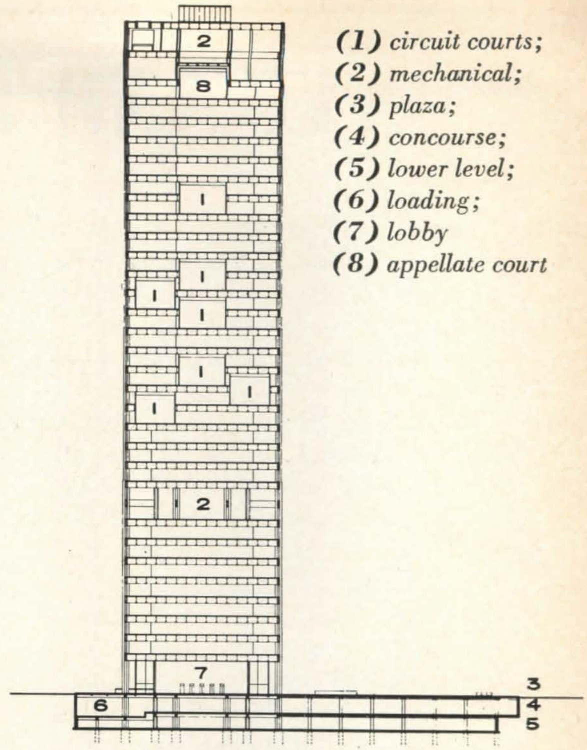
The Chicago Civic Center does dignified justice to its site in the birthplace of the skyscraper. The attention to structure would have pleased Major Jenney; the expression of structure and function would have won the praise of Sullivan; and it is easy to imagine Mies smiling benignly from his apartment not far away. If there are questions about working those many different spaces into a uniform skin, or the advisability of such a vast, hard open space, or the perhaps too-close similarity in treatment to the Federal Center, they are criticisms in degree, not all-out condemnations. Once the architects determined to build this type of building with its own kind of interior and exterior space, they did a top-notch job of it.

***Supervising Architect:*** *C. F. Murphy Associates.* ***Associate Architects:*** *Skidmore, Owings & Merrill and Loebl, Schlossmann, Bennett & Dart.* ***Project Architect and Chief Designers:*** *Jacques C. Brownson.* ***Structural Engineers:*** *Severud-Elstad-Krueger Associates.* ***Acousticians:*** *Bolt, Beranek & Newman.* ***Lighting:*** *Edison Price.*

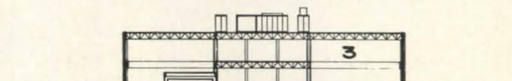



*Column detail (above); profile (below).*

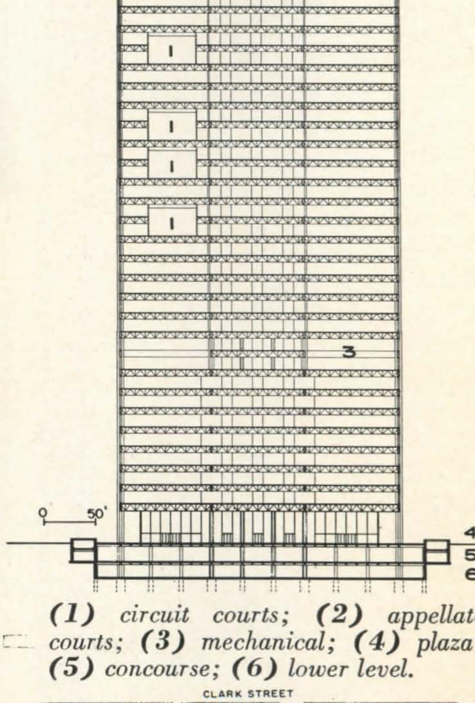




***(1)*** *circuit courts;*
***(2)*** *mechanical;*
***(3)*** *plaza;*
***(4)*** *concourse;*
***(5)*** *lower level;*
***(6)*** *loading;*
***(7)*** *lobby*
***(8)*** *appellate court*



***(1)*** *circuit courts;* ***(2)*** *appellate courts;* ***(3)*** *mechanical;* ***(4)*** *plaza;* ***(5)*** *concourse;* ***(6)*** *lower level.*



# NYU AND THE NAKED EMPEROR

The NYU library may be a step closer to realization, but in the eyes of many in the Greenwich Village community, the architectural establishment is that much further from commanding serious public respect.

There were 29 community organizations opposed to the library at the time it was approved 12-10 by the New York City Board of Estimate on August 25. (In July, the City Planning Commission cast its 5-2 vote, with architect Harmon Goldstone one of the two dissenters.) For a detailed account, see the JUNE 1966 P/A; for a shirtcuff jog to the memory, recall that NYU essentially needed three changes in city regulations to build this design on this site: (1) a map change on West Broadway, narrowing the road by 40 ft; (2) another map change—also only on paper—to widen West Third Street from 70 ft to 75 ft, to accommodate a larger building; and (3) amendment of the original Housing and Redevelopment Board agreement of 1954, which limited cornice height along the south side of the park to 60 ft, and required a 45-ft setback before going higher.

The discussion that follows is not a recapitulation of all pros and cons in the controversy, one that is complicated by a long-standing animosity between those involved. Instead, it is a report on the most recent public hearing, before the Board of Estimate, particularly as it concerns the architectural profession. (It should be noted that all architects who testified at the hearing were on the side of NYU. No practicing professionals joined the opposition openly, although several are known to have been with it in spirit.)

It would seem almost a law of nature that a profession would try to avoid airing its dirty linen in public; it would seem questionable to have on record such testimony as, "My name is John Doe. I have been a member of the AIA for 15 years, and I don't think Joe Smith can design his way out of a paper bag." And perhaps it is too much to expect serious public discussion by practicing professionals of any building. But for competent and thoughtful professionals to enter the case with less than irreproachable arguments should cause the profession at least embarrassment, and at most concern. The building that may cast its shadow on Washington Square Park may cast a longer shadow on the name of Architect.

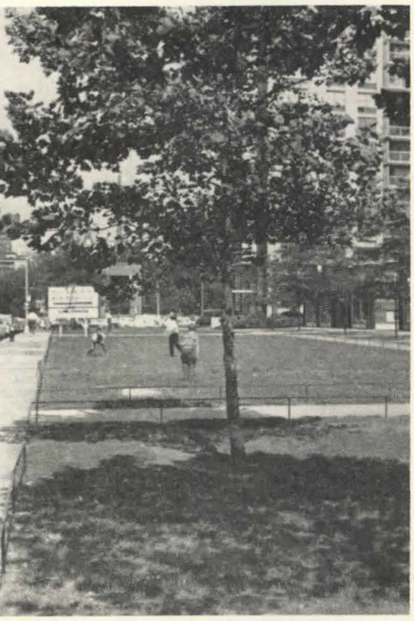
The hearing was a four-hour, three-ring event, presided over by a bored and impatient Mayor John Lindsay. In citing his reasons for an aye vote, he seemed to grasp little of the complexity of the argument. He appeared to understand only one side well, as if he had made up his mind early in the game, and had only paid attention when his team was at bat.

Like the expert witnesses called by both sides at a legal trial, the several architects gave their supporting evidence, all in support of the Philip Johnson design. One prominent architect, speaking for the Urban

Photos, except as noted: Ellen Perry Berkeley

*Mock-up of the proposed library has been built within the controversial 40-ft strip.*

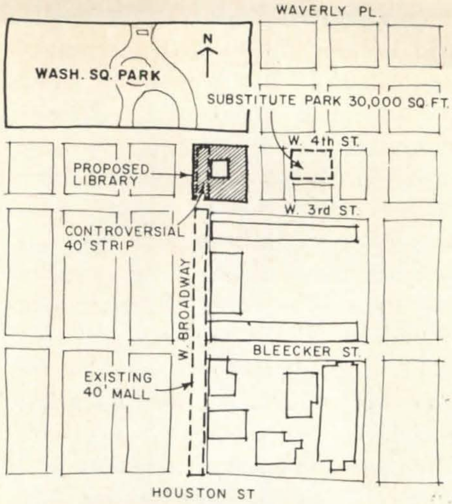
Design Committee of the local AIA chapter, reported its unanimous reindorsement of an earlier position in favor of the library. The statement made clear that the argument "was, and still is, about Urban Design for the City, not detailed architecture." Villagers feel that since the plan was not considered, this Urban Design is only an exercise in façadism. Whatever Urban Design is, and many are still struggling for a definition, 29 Village organizations and numerous other individuals do not want the kind of Urban Design they are being given here.



*Looking northward to the site.*

There was further mention at the hearing of European squares, as there has been throughout the controversy; and to be against them is clearly un-American. The testimony from the AIA's Urban Design Committee stated that the library will "contain the great park space, completing the urban design in the manner of great English and French squares."

Johnson also spoke of English and French squares and parks, and the need for enclosure. But, to some Villagers, Washington Square Park is too large to be treated as if it were a small European square. Its spatial qualities are different in various sections, it is pointed out, and its onetime unity of enclosure has long since vanished. (The most recent demolition removed the 19th-Century houses called Genius Row, taken down by NYU in the 1950's. There was no unified wall around the park even at that late date, of course.)




There was mention, too, at the hearing, of space "leaking out" of the park. Johnson put it this way: "We feel that the wall of the park-room should be as complete as we can make it. Therefore, we suggested the narrowing of West Broadway back to its present width, avoiding thereby the unsightly leak of a wide street to the south."

What happens when space develops an "unsightly leak"? And when does the flow of space (usually a Good Thing) become space that leaks (always a Bad Thing)? These matters are never defined in terms that are intelligible to the citizen who just likes grass. Or is it possible that some people have figured it out and just like their space leaky? NYU and Johnson seem to define leaky space as something less desirable than a skin ailment; to cure this condition, they are seeking to build on 8375 sq ft of public land. The community says it has been "had," a term that needs no definition.

What about the cornice height and the proposed change of the 1954 Housing and Redevelopment Board agreement? In the view of the local community, one does not have to be bound to an earlier commitment, if one's architect is sufficiently famous and he vouches that, with certain restrictions lifted, his design will be more beautiful. At the hearing, one member of the opposition questioned why NYU had not said to Philip Johnson, "Build the best building you can *without* changing the restrictions."

There has never been an alternate proposal from the architects. ("We don't do things that way, and there was never any question but that we'd include some portion of the 40-ft strip.") But there has been frequent mention, from NYU and others supporting this design, of an $800,000 already spent in design fees. The opposition calls it arrogant to design a building as if there were no restrictions on the site.

One of NYU's continuing arguments is that it is doing what is best for the Square and for the community. They point out that, when they tear down the present ANTA theater and build a new science building, they will be providing a new park three times the size of the 40-ft strip. But Village opponents contest that the substitute open area will be well within the NYU "campus," and can be expected to be used primarily by students. When asked by the Board of Estimate whether this was not so, Johnson replied no, it won't be a private park, the streets will remain open. It was an answer, but not to that question.

Concerning the plan itself: One architect was intending to testify that NYU was doing an admirable deed in going "all-out for art"; but he was not planning to mention what he has been saying privately to various people—that he thinks the building "impossible" as a library. (He actually did not testify; NYU decided at the last minute that they did not

*Interior of proposed library.*

Photo: Courtesy NYU

need him.) Another architect testified that the atrium was necessary for the large perimeter a library needs, and did not mention the possibilities of air conditioning and artificial lighting. Johnson himself says that the 6150-sq-ft atrium is necessary as circulation space for a library that will reach a 5000-seat capacity; but one Villager privately expressed doubt about circulation in the upper levels of the atrium, unless they fasten vines to the railings and let the students swing from level to level.

And so it went. Feelings have run high, and contempt is one of the strong feelings that each side—NYU and the opposition—has shown for the other.

Immediately following the Board of Estimate vote, a taxpayers' suit against the city was announced, charging that the street demapping is a disposal of property without due process of law, since (among other things) the Department of Parks has authority over various design elements of streets within 350 ft of any park. So says the city charter, and so said Parks Commissioner Hoving, in a surprise last-minute statement at the hearing. In a comment that must have been facetiously intended, he also recalled European precedents: If the 40-ft strip remains open, the three-block strip might be nothing less than "a sort of Champs Elysées of Lower Manhattan." The suit will request an injunction against construction; when NYU has replied, a trial will follow.

The day after the Board of Estimate decision, it was reported in *The New York Times* that the Director of Community Relations for NYU had politically "threatened" Democratic district leader Edward Koch, an alumnus of NYU's law school, one of the leaders of the opposition, and currently a candidate for City Council. Koch was accused of hurting NYU as Ralph Nader had hurt GM, with the implication that Nader just had a grudge against GM, and his criticism had nothing to do with cars at all. In other words, Nader just made up the details once he decided to fight.

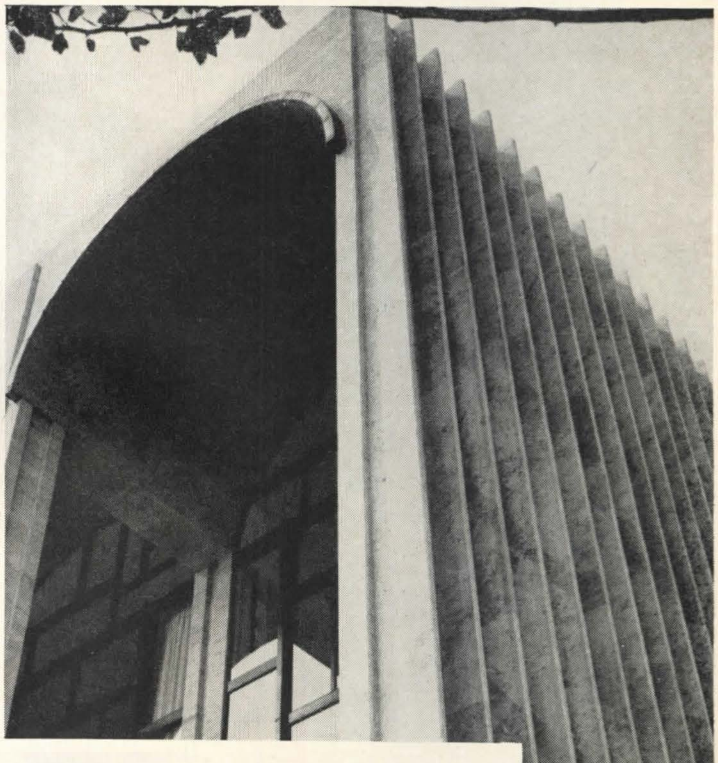
Throughout this controversy, NYU has been trying to suggest that the opposition has no valid architectural arguments—that it is a "leftover opposition," made up of people with nothing else to do, trouble-makers, fanatics. But people can know a good deal about architecture—more than architects often give them credit for. What the people of Greenwich Village seem to be saying in this library controversy is that not only is the building very possibly not the best working library, which would be NYU's problem, but that NYU is giving them reasons that insult their intelligence and integrity, which is a community problem. They sense that the architectural profession is using its expertise and what it would like to consider its exclusive possession of the Grail to "snow" the officials; and this is the architects' problem. It is regrettable that architects enlisted on one side only; for one thing, the other side could have used the weight of professional architectural rebuttal, and, for another, it is possible that their experts would have looked no better and no worse than NYU's experts.

If the library is built as now designed, so the opposition feeling runs, it will undoubtedly be a distinguished building (so defined as one designed by a distinguished architect), and NYU can go on to become a great university (so defined, by NYU, as one with a great library). It's a great society, and it's been a great parade down in Greenwich Village. There's only one trouble. The emperor—and quite a few of the other people—has no clothes on.—EPB


*The annual Village art show.*

# A NIGHT AT THE OPERA

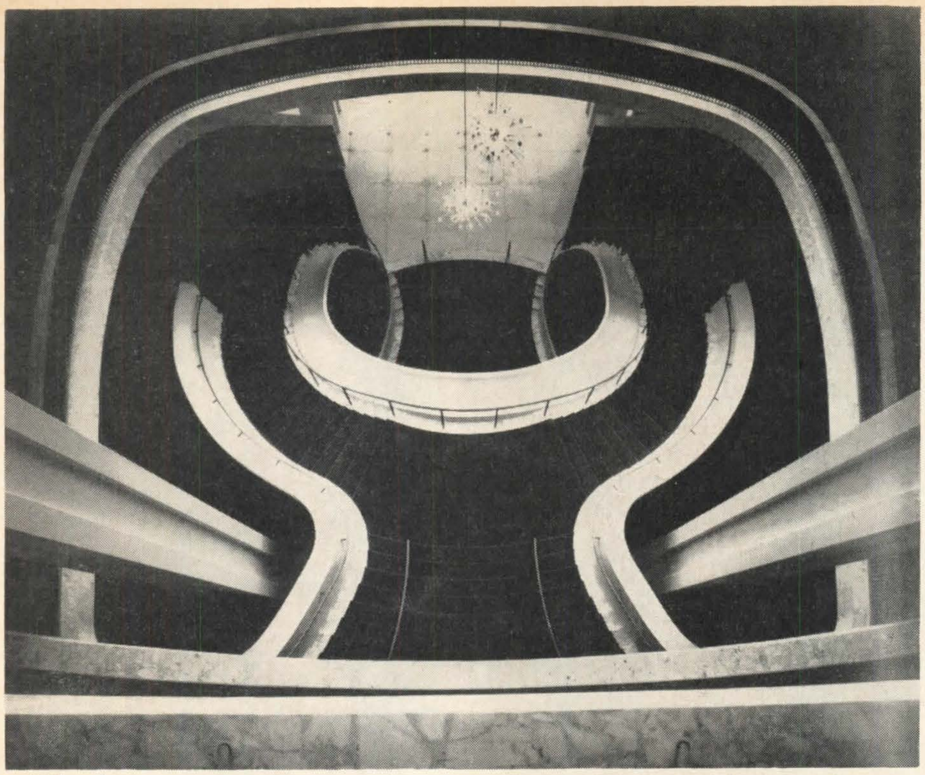
On September 16, the new Metropolitan Opera House—architect Wallace K. Harrison's $45,700,000 conservatory at the keystone of Lincoln Center—opened, providing 800,000 cu ft for the musicological delight of 3788 persons. For a change at Lincoln Center, the acoustics are favorable. Those are the facts. Since the opera for the debut was Samuel Barber's setting of Shakespeare's *Antony and Cleopatra*, we will let the Bard speak for the design of the opera house through pertinent passages from his play.



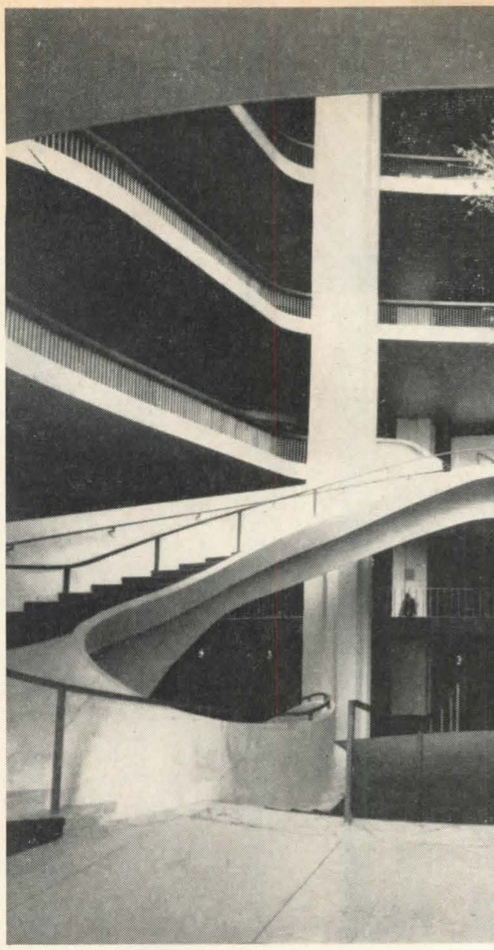
*". . . The wild disguise hath almost Anticked us all."*

ANTONY: *"It is shaped, sir, like itself; and it is as broad as it hath breadth. It is so high as it is, and moves with its own organs. It lives by that which nourisheth it; and the elements once out of it, it transmigrates."*
LEPIDUS: *"What colour is it of?"*
ANTONY: *"Of its own colour too."*
LEPIDUS: *"'Tis a strange serpent."*

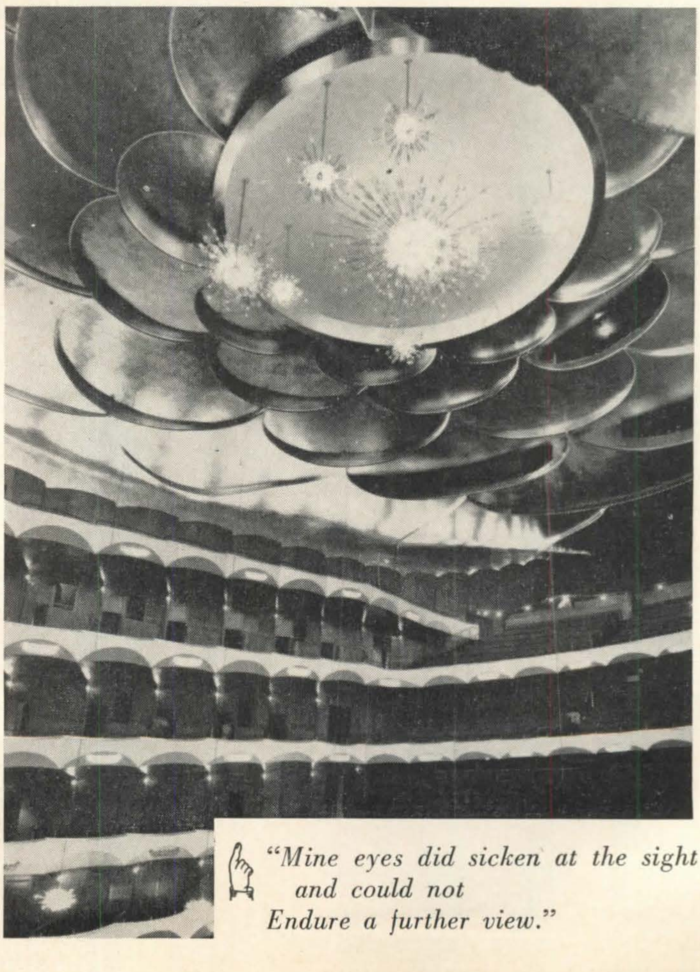
*'Though he be painted one way like a Gorgon,*
*The other way's a Mars."*



*"For her own person,*
*It beggared all description. She did lie*
*In her pavilion, cloth-of-gold of tissue,*
*O'erpicturing that Venus where we see*
*The fancy outwork nature."*

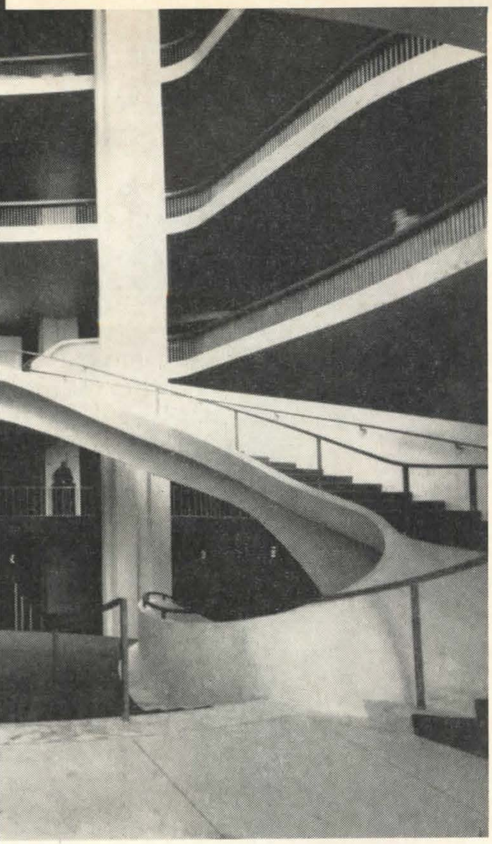


*"Naught, naught, all naught! I can behold no longer!"*



*"Mine eyes did sicken at the sight and could not*
*Endure a further view."*

*". . . Nature wants stuff
To vie strange forms with fancy . . ."*



*". . . Come,
Let's have one other gaudy night."*

*". . . High events as these
Strike those that make them; and their story is
No less in pity that his glory which
Brought them to be lamented."*

***Architect:*** *Wallace K. Harrison, Harrison & Abramovitz.* ***Structural Engineer:*** *Syska & Hennessy, Inc.* ***Acoustical Consultants:*** *Vilhelm L. Jordan and Cyril M. Harris.* ***Stage Equipment Consultants:*** *Walter Unruh, Louis Edson, Rudolph Kuntner.* ***Auditorium Seating Consultant:*** *Ben Schlanger.* ***Stage Lighting Consultants:*** *Rudolph Kuntner, Stephen J. Skirpan, Walter Unruh, Syska & Hennessy.* ***Planning and Architectural Liaison:*** *Herman E. Kravitz.* ***General Contractor:*** *George A. Fuller Co.*

*"The breaking of so great a thing should make
A greater crack."*

*". . . you shall find the band that seems to tie their friendship together will be the very strangler of their amity."*

MECHANICAL ENGINEERING CRITIQUE

# BOILERS MOVE UPSTAIRS

BY WM. J. McGUINNESS

*Mechanical equipment in multistory buildings is frequently installed above ground level. McGuinness, a practicing engineer in New York City, traces the reasons for this, and describes a current installation in San Francisco.*

In contemporary high-rise structures, much of the mechanical equipment—such as chilled-water units, air-handling units, domestic hot-water storage, and cooling towers—is strategically located throughout the building. This development to a more selective planning in locating such equipment has shortened duct runs, minimized piped connections between equipment, and in general has produced more efficient systems. And, importantly, it has reduced mechanical bulk.

Ideally, of course, the cooling tower should be placed next to the water chillers, which in turn should adjoin the air-handling center, with the latter located in the geometric center of the air-distributing system. An arrangement such as this will usually result in a better mechanical balance and strengthen the architectural design of the building. We will then be expressing mechanical function in much the same way as we have always attempted to express a building's structure, or type of occupancy.

This does not mean to imply that mechanical equipment should become the predominant design factor, leading to a mechanistic architecture. The expression of function or occupancy will still frequently take precedence. For instance, it is often necessary to move equipment out of places that have more valuable and appropriate use, such as the basement.

## The Trend Is Up

Traditionally, the basement was always the logical place in which to put boilers—or all equipment, for that matter. Buildings were not as high, and distribution of steam and domestic hot and cold water was on an "up-feed" basis. Boilers and their masonry supports were heavy; and periodic servicing was much more essential then. In addition, fuel supply—generally coal in those days—was also stored close to the boilers.

The advent of the high-rise building meant that first stories were often left open for better street-level circulation, which in turn led to an exodus of mechanical equipment from the basement.

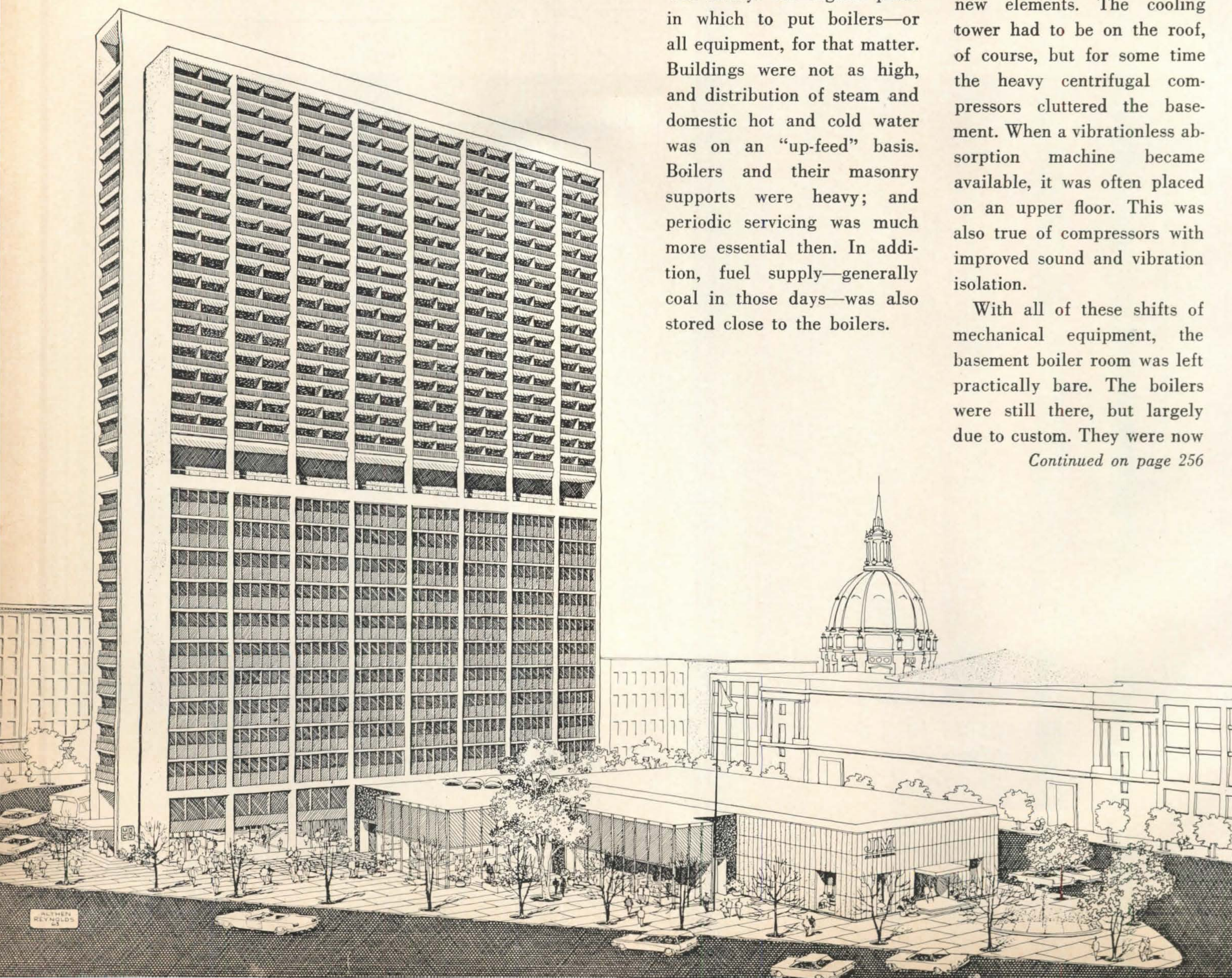
Steam mains at the basement perimeter were eliminated, together with the vertical risers ascending from them at the building façades. It was hardly practical to have the risers pass through the open first story, and difficult to hide them against the exposed columns. Instead, steam was piped through the center of the structure, to be converted at an upper story to hot water for down- (or up-) feed hot-water heating.

## Cooling Rises, Too

The increased use of central air conditioning added some new elements. The cooling tower had to be on the roof, of course, but for some time the heavy centrifugal compressors cluttered the basement. When a vibrationless absorption machine became available, it was often placed on an upper floor. This was also true of compressors with improved sound and vibration isolation.

With all of these shifts of mechanical equipment, the basement boiler room was left practically bare. The boilers were still there, but largely due to custom. They were now

*Continued on page 256*



And that's *exactly* what we mean. You can literally forget about it—because we'll take it from there.

American's team of laundry planning engineers will make surveys; recommend equipment; furnish comprehensive floor plan drawings *and specifications* for foundations, electrical circuits, steam and water requirements, even the size of door openings—no item is overlooked.

In fact, American will continue to offer service to your client long after the building is completed.

Architects we have worked with find our laundry planning assistance invaluable. Wouldn't you? (A list of these firms is available upon request.) Check our catalog in Sweet's Architectural File, section 26g. Our offices and representatives are listed conveniently in the Yellow Pages—call American today!

# Architects

ve your next laundry planning problem to AMERICAN*... ...then

# forget it!

On Readers' Service Card, Circle No. 328

lighter and largely automatic in operation, supervised—often from a remote distance—by an electronic console.

## Fox Plaza Solves Problems

The Fox Plaza Building in San Francisco is a good illustration of the problems under discussion.

The building is somewhat unusual in its division of function and occupancy: It comprises 16 apartment floors above a thirteenth-story mechanical floor, and 10 office floors, 2 commercial, and a basement parking garage below it.

Apart from occuping a floor difficult to rent to superstitious tenants, the mechanical floor freed the basement for valuable parking income, separated the two main occupancy zones, and enabled the designers to install the shortest possible pipe runs to offices and apartments.

## Split Systems

With San Francisco's equable climate, air conditioning was considered unnecessary for the apartments, but it was installed in the offices and commercial floors. The mild climate also permits designers to move the apartment heating units away from the customary location beneath windows and install fan-coil units in small closets next to glass doors that open onto terraces.

Lacking air-conditioning ductwork, the apartments could be finished without suspended ceilings. However such ceilings are used throughout the office floors to conceal a sophisticated double-duct, high-velocity air system that heats and cools the floors. To accommodate the duct space, the designers increased the floor height: apartments are 9'-3"; offices are 12'-4", with an 8'-6" ceiling height.

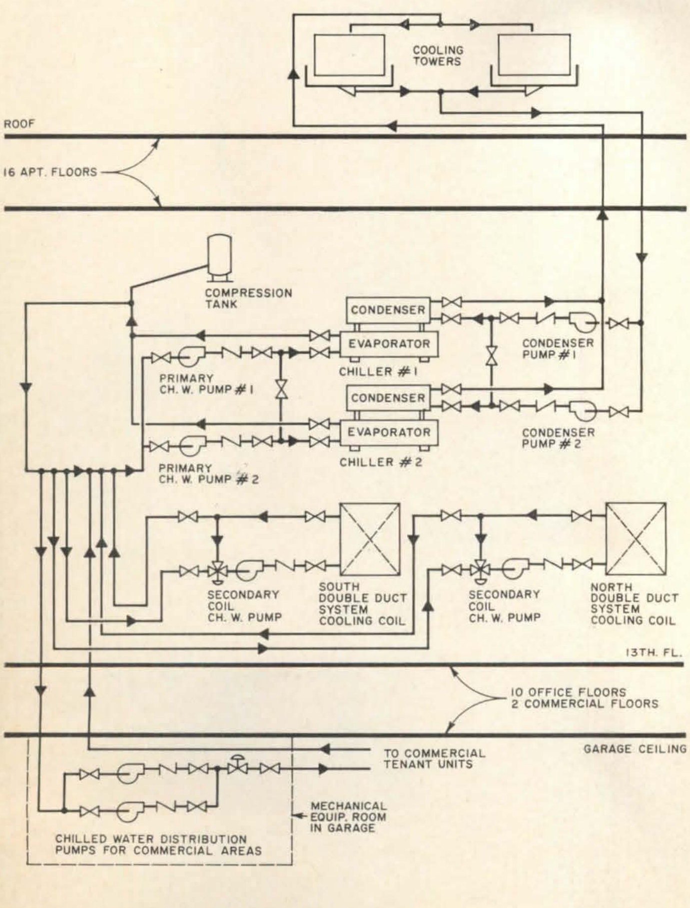
## Scattered Sources

Tenants in the commercial floors can exercise some control over their air conditioning, which is supplied with chilled and hot water from a small equipment room in the basement.

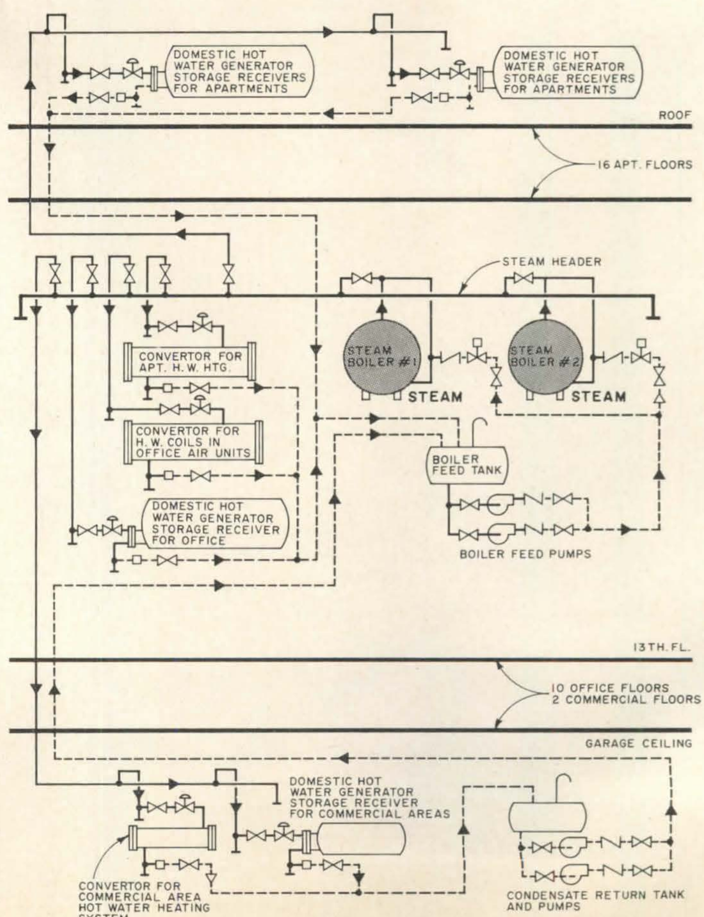
Hot water for the upper floors is converted from steam at the thirteenth floor and fed to the fan-coil units in apartments, and the double-duct system in the offices. The same equipment room supplies domestic hot water to the offices, but apartment domestic water is fed from generators at the top of the building.

The steam boilers are powered with gas supplied on an interruptible basis, with No. 2 fuel oil stored in underground tanks serving as a stand-by fuel.

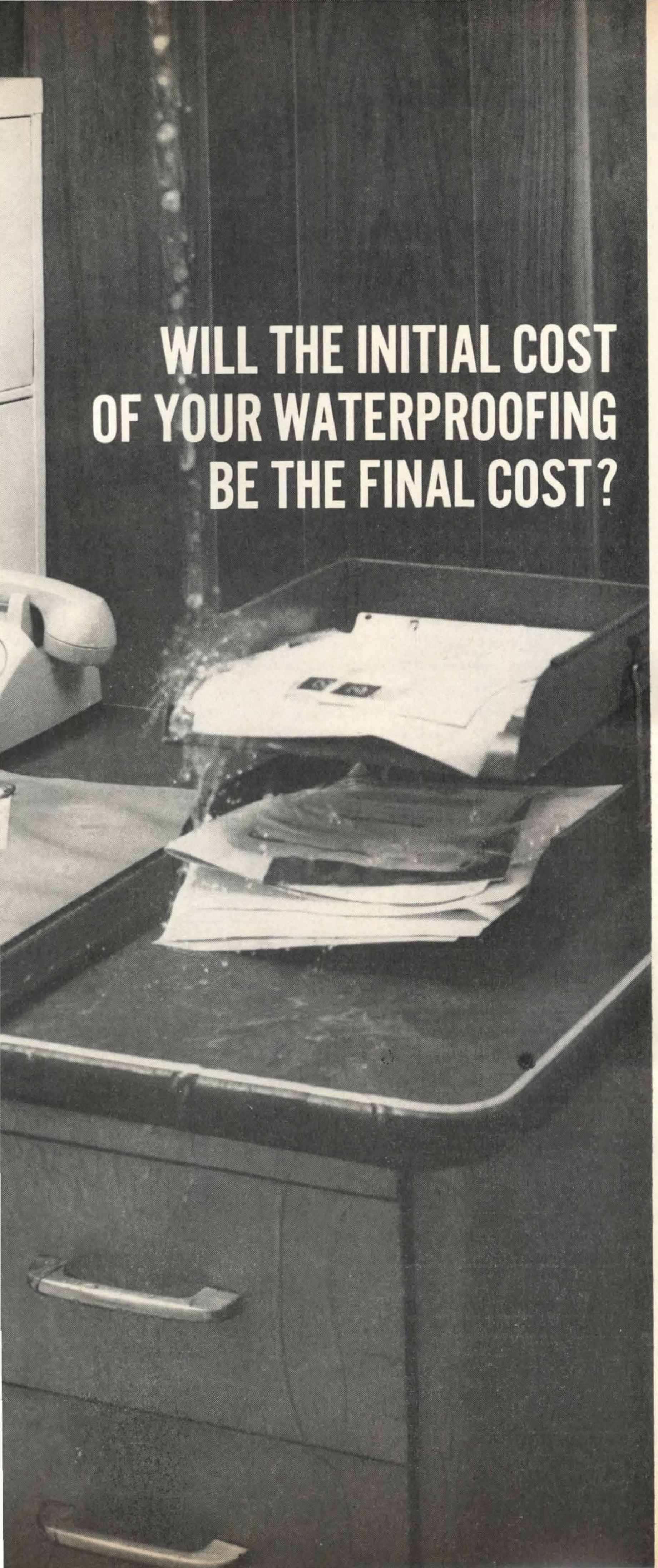
Victor Gruen Associates, Inc., of Los Angeles is the architect-engineer for Fox Plaza.




CENTRAL PLANT & CHILLED WATER DISTRIBUTION




CENTRAL PLANT AND STEAM DISTRIBUTION




# Waterproofing specialties... less than 1% of your building's cost...can cause major problems if they don't deliver total performance.

The many waterproofing products that go into a new building are seldom thought of as a system. As a result, a consistently high standard of quality is often missing. Specs shift from brand to brand. Yet the burden of waterproofing an entire building rests upon these products. If just one fails, tremendous water damage can result.

Grace gives you the full-line proven performance that can prevent this: Hornflex, Hornseal and Vulcatex caulks and sealants, Daracone and Hydratite water repellents, Dehydratine dampproofing compounds, Monastite, Waterfoil and many others. Whatever the need, there's a special Grace waterproofing product that fills it best.


**And the new Grace Spec Kit makes specification complete, simpler and more accurate.** A concise, central source for a wide range of specialty products, the Kit lets you select products quickly, spec out entire systems in minutes, actually write specs in a few words. It includes:

(1) **Preprinted Specification Work Forms** for 45 major products. Simply tear out and fill in your brand choices.

(2) **Ultra-condensed Product Selector Guide.**

(3) **140-page Product Handbook.**

Get your free Spec Kit by writing on your firm's letterhead to: Grace Construction Materials, 62 Whittemore Avenue, Cambridge, Massachusetts.

**GRACE CONSTRUCTION MATERIALS**

**A. C. Horn Products · Darex Construction Chemicals**
**Rock Products Chemicals · Servicised Products**

Cambridge, Massachusetts Chicago Houston
Los Angeles Montreal North Bergen, N. J.
San Francisco Scarborough, Ontario.

SPECIFICATIONS CLINIC

# TWO BASIC TYPES OF SPECS

BY HAROLD J. ROSEN

*Not all specifiers understand the difference between the two types of specifications. Rosen, who is Chief Specifications Writer for Skidmore, Owings & Merrill, New York, sets the record straight.*

There seems to be a misconception on the part of some specifications writers concerning the definition and composition of both performance specifications and descriptive specifications. This is unfortunate, since we expect the specifier to be well-versed in the art of communication, to be precise in the choice of words and exact in defining terminology.

A recent round-robin critique by several leading specifications writers on some of the major issues affecting construction specifications showed that not everyone clearly understood the difference between the two types of specs.

A review of the too few textbooks available on specifications writing disclosed that only one discusses the subject of performance specifications.

## Descriptive Specifications

Descriptive specifications are generally well defined and understood. There is no dispute as to the meaning of the term or how it is used. A descriptive specification is written on the basis of methods. It describes in detail the materials to be used, and the workmanship required to fabricate, erect, and install the materials.

Descriptive specifications are used most widely by the specifier for technical sections of the specifications that involve the traditional, older crafts. Concrete, masonry, carpentry, lathing, and plastering are examples of technical sections that have a history of long-use experience and a body of readily available information.

Most architects have been exposed to these crafts, both in their university training and in their involvement with on-site construction. This permits the specifier to describe what the basic materials are; how they will be proportioned in the case of concrete, mortar, and plaster mixes; how they will be placed; how they will be finished; and how tested.

By describing the method by which a contractor performs these older crafts, the specifier will achieve a certain end result, since these instructions have produced the same result time after time.

## Performance Specifications

What do we mean when we use the term "performance specifications"? The varied answers to questions concerning its use stem from the lack of a clear-cut definition of the term. In researching many sources, no satisfactory definition was uncovered.

If we assume that when we specify methods we describe how an end result is obtained, then it must follow that, if we can visualize what the end result should be but do not know how to achieve it, we must specify performance characteristics in order to obtain this end result.

We can now define the term "performance specification" as one that specifies end results by formulating the criteria for its accomplishment. A performance specification can then be written for a material or a piece of equipment and for workmanship and installation.

The performance specification is usually written for new materials and their installation. Since it is the end result that the architect is interested in, it would be far better to permit a manufacturer, who has more knowledge about a product, to manufacture a material that will provide a certain result. In lieu of telling the manufacturer what the ingredients are, specify what the end product must do.

Under this type of specification for a sealant, the manufacturer is given wide latitude in the selection of materials and their formulation by simply establishing that the sealant must exhibit certain characteristics, such as tension and cohesion strengths, ozone resistance, and other properties.

## Covering the Variables

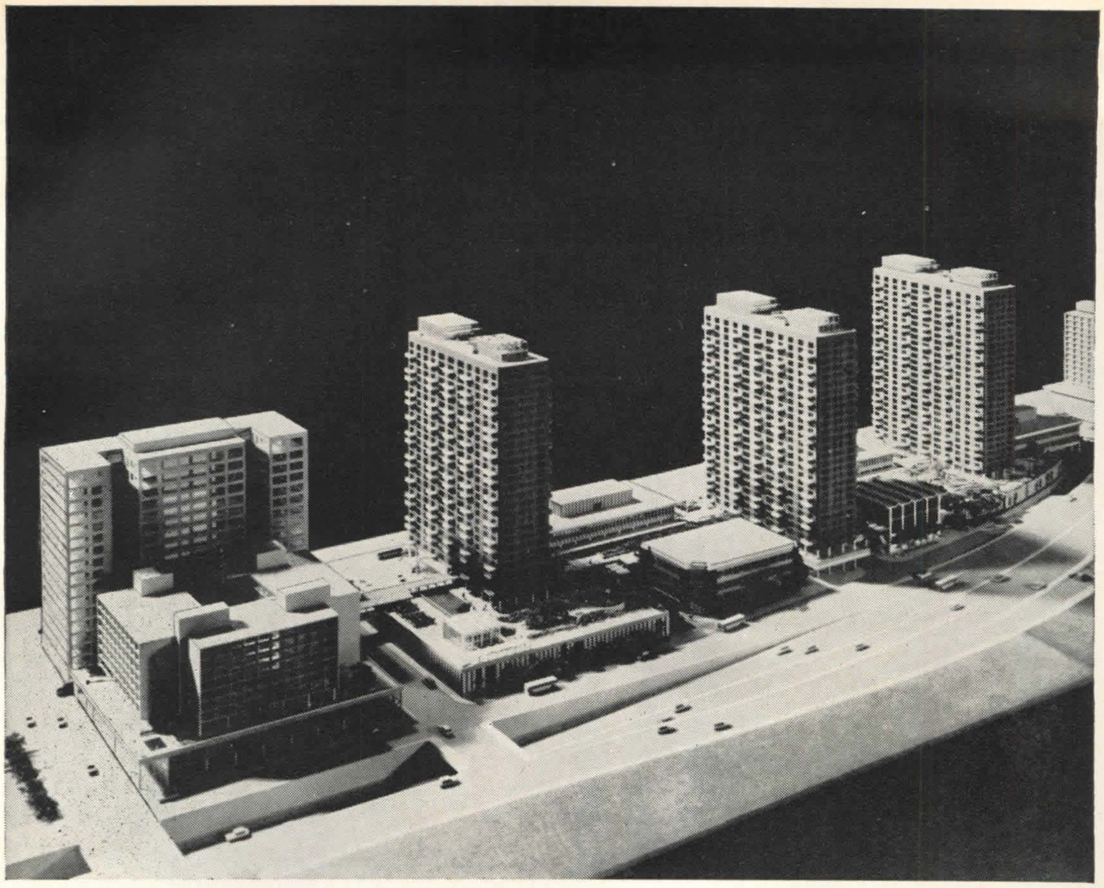
It is conceivable that a dozen materials of varying formulation could be compounded that will meet this specification. Since it is the end result that is desired, the architect is not concerned whether the sealant is made of polysulfide, urethane, acrylic, silicone, neoprene, or even chewing gum, if the latter could meet the specification.

When the architect is confronted by a new situation where existing materials will not satisfy his criteria, and, since he is not expert in manufacturing a new material, he will spell out his requirements for the end result by formulating the criteria for its accomplishment.

An architect can likewise specify the performance requirements for constructing a waterproof basement rather than designing and detailing it. When he does so, he places the burden of achieving the end result on the contractor.

The specification should contain certain performance criteria. What is a waterproof basement? How is it determined? The performance specification should include provisions for determining the waterproof characteristics by calling for hose tests or other water tests over a protracted period and for a guarantee to assure the architect that the construction is truly waterproof.

Another example of the difference between a descriptive specification and a performance specification is illustrated by the requirements for finishing a terrazzo floor. A descriptive specification would state that "the terrazzo shall be machine-rubbed, using a No. 24 grit or finer abrasive stone for the initial rubbing; it shall then be resurfaced, using No. 80 grit or finer abrasive stone." A performance specification would state that "the terrazzo shall be ground to a smooth finish, matching a sample on file in the architect's office."



PAUL W. LASHLY,
LEWIS KITCHEN and
THE WILLIAM J. MORAN CO.
*developers*

SCHWARZ & VAN HOEFEN
*architects*

FERRIS & HAMIG
*mechanical engineers*

WILLIAM J. MORAN CO. and
TURNER CONSTRUCTION CO.
*general contractors*

T. J. SHEEHAN
*plumbing contractor*

CRANE SUPPLY CO.
*plumbing wholesaler*

CRANE COMPANY
*fixture manufacturer*

Among the countless luxuries of the Mansion House Apartments is the gift of quiet living. Engineered sound control throughout insures that neither a neighbor's Hi-Fi, nor the strains of a concert on the promenade deck below will disturb the tranquility of any apartment. Selected to complement this "hear a pin drop" atmosphere are 1400 Sloan Quiet-Flush II Flush Valves.

# Mansion House Center

## *—a New 52 million dollar Apartment Community on historic St. Louis riverfront site*

■ In the shadow of the Gateway Arch, St. Louis' newest landmark—and on the site of the historic Mansion House, one of the city's oldest landmarks—stands the elegant new Mansion House Center representing a truly spectacular and unique venture in urban living. Rarely have modern design, materials and technology combined to produce an apartment community with such impressive services, planned conveniences and interesting facilities. The three 28-story apartment buildings, sheathed in bronzed aluminum, are the tallest of their kind in the city. In addition, three adjacent commercial buildings provide Mansion House Center with offices, retail stores, restaurants and social clubs. On the beautiful six-acre promenade are an interdenominational chapel, lushly landscaped lawns and gardens, reflection pools, illuminated fountains, and statuary by internationally known sculptors.

The flush valves selected for Mansion House Center are Sloan's new Quiet-Flush II Flush Valves. With Quiet-Flush II, Sloan has once again raised the standards of flush valve quality and performance, incorporating a new dimension in quiet operation, new dependability, new ease of installation and new smart appearance. Sloan is the Flush Valve of Tomorrow—Today—be sure to specify and insist on Sloan for your new building.

SLOAN
FLUSH VALVES

**SLOAN VALVE COMPANY • 4300 WEST LAKE STREET • CHICAGO, ILLINOIS 60624**



On Readers' Service Card, Circle No. 429

# THE ARCHITECT'S LIABILITY AND THE CONTRACTOR: PART I

BY BERNARD TOMSON AND NORMAN COPLAN

*In the first of several articles, P/A's legal team discusses a recent Illinois case that has important implications concerning an architect's liability for a contractor's work.*

Although there has been an evident judicial trend extending the areas of the potential liability of an architect in the performance of his duties, it had been thought relatively well settled that an architect is not liable for the method or manner in which a contractor performs his work and that he is not responsible for the safety of the contractor's employees on a project. However, a decision of the Supreme Court of Illinois in 1966, affirming in part and reversing in part a determination of the Appellate Court of Illinois rendered in 1965 in the case of *Miller v. DeWitt* (208 N.E. 2d 249), has serious implications for the practicing architect or engineer.

The *Miller v. Dewitt* case involved a suit against a firm of architects by several workmen employed by a contractor, for injuries sustained in the collapse of a roof, which resulted from inadequate shoring. The primary issue was whether a supervising architect could be charged with liability for injuries to workmen arising from the contractor's method of performance, and whether, under the contract documents of the AIA, which had been utilized by the parties concerned, the architect was responsible for the safety of working conditions provided by the contractor to his own employees. The defending architects and the professional associations in Illinois argued that the architect only has the duty to see that construction, when completed, meets the plans and specifications contracted for by the owner, and that he has no duty to control the methods used by the construction contractor. The highest court of Illinois, however, rejected this argument, holding that an architect, in the exercise of reasonable care, should have known that the contractor's shoring was inadequate or unsafe, and had a duty to stop the work until the unsafe condition had been remedied; and that such duty, if breached, creates a cause of action for workmen who could foreseeably have been injured by the failure of the architect to stop the work.

The facts as reported by the Illinois courts were that a school district had decided in 1959 to remodel and enlarge the gymnasium at its high school, and had contracted with architects to prepare the necessary plans and specifications and to administer the construction contracts. The contract between the school district and the architects was the architect-owner agreement of the AIA, which provides that "the architect will endeavor to guard the owner against defects and deficiencies in the work of contractors, but he does not guarantee the performance of their contracts."

The contract beween the school district and the general contractor incorporated the General Conditions of the Contract of the AIA and provided, among other things, that the contractor "shall take all necessary precautions for the safety of employees on the work," and that the architect "has authority to stop the work whenever such stoppage may be necessary to insure the proper execution of the contract." The specifications further provided, in respect to bracing and shoring, that "the contractor shall provide all bracing, shoring, and sheeting as required for safety and for the proper execution of the work, and have same removed when the work is completed."

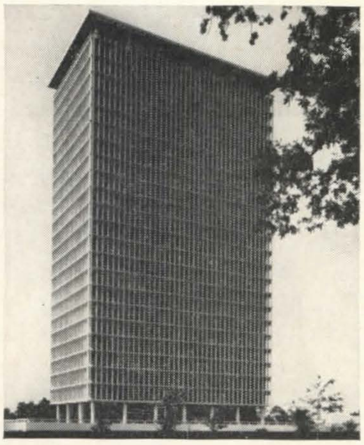
The plans for remodeling called for the "removal of the west wall of the gymnasium; the removal of a north-south proscenium truss from that point (the old west wall) to the new west wall of the new gymnasium; the removal of two steel columns in the old west wall, which, together with the proscenium truss, originally supported the west ends of four east-west roof trusses; the substitution where the old west wall and proscenium truss were of a new north-south main-bearing truss into which would be fastened the west ends of the old roof trusses and the east ends of the trusses in the new structure."

The contractor, after examining the plans and making a personal inspection of the structure, and before any part of the west edge of the old roof had been cut away, determined to shore up the west ends of the four east-west trusses during the transition by means of four columns or towers of tubular steel scaffolding, each composed of four legs and placed generally and approximately under the west ends of each of the four east-west trusses with timbers composed of 2 x 10's laid on top of the legs of the towers on which the trusses directly and temporarily rested.

On a certain day in 1960, an iron-worker crew employed by the general contractor came to the scene and commenced to remove the north-south proscenium truss and the two steel columns at the west end of the old gymnasium. When the two center east-west roof trusses were disconnected from the proscenium truss, that part of the roof load that had been supported by the west end of such two center east-west trusses and the proscenium truss was transferred to the shores thereunder. Later that afternoon, operations were begun to remove the north steel column. Upon the removal of that column, that part of the roof supported by the west end of the north east-west truss was shored up. A similar method was used to remove the south column. At the time the south column was removed, the roof collapsed, and three of the workmen were seriously injured.

In next month's column, we will discuss the legal contentions of the parties and the decision of the Appellate Court of Illinois upon the appeal from a verdict in favor of the plaintiffs and against the architects.

# Proud of your building?



Styled by Rosco Products, Inc.

Lloyd, Morgan & Jones are the proud architects of the American General Insurance Building in Houston, Texas. They chose Fiberglas for that feeling of quality that's the finishing touch to any building. That's what a uniform exterior appearance does: it enhances all the other features of a building. Ask any architect or interior designer. They know Fiberglas will give them that modern look that combines practicality with handsome design.

They know Fiberglas is:

Sturdy: Fiberglas is flame-resistant, unaffected by humidity, resistant to sun. Won't stretch or shrink.

Economical: Fiberglas is washed, not dry-cleaned, never needs pressing or alterations due to changes in size. Fiberglas also helps reduce heating and air-conditioning costs because it insulates—year round.

Beautiful: Fiberglas fabric allows free play with color, texture and pattern on the inside, and looks uniformly beautiful from the outside.

So if you want to give your building the modern look, why not turn to Fiberglas, the fabric that does a professional job for professional people. For more information and Fiberglas fabric resources, write:

Owens-Corning Fiberglas Corp., Decorative and Home Furnishings Div., 717 Fifth Ave., N.Y.C. 10022.

OWENS-CORNING
FIBERGLAS

# It deserves Fiberglas* Beta* draperies.

The American General Insurance Building, Houston, Texas; Architects: Lloyd, Morgan & Jones. *Fiberglas and Beta are Owens-Corning trademarks. Owens-Corning Fiberglas makes the Beta yarn, not the fabrics.



On Readers' Service Card, Circle No. 502

BOOK REVIEWS

# Frankleudreit?

BY PETER COLLINS

FRANK LLOYD WRIGHT: A STUDY IN ARCHITECTURAL CONTENT. *By Norris Kelly Smith. Spectrum Paperbacks, Div. of Prentice-Hall Publishing Co., Rt. 9W, Englewood Cliffs, N. J., 1966. 178 pp., $2.45 (paper) $5.95 (cloth). The reviewer is Professor of Architecture at McGill University, Montreal, Canada.*

During the last 50 years, there have appeared about a dozen books on architectural history that can justifiably be described as masterpieces. This is one of them. It is quite short, but in it Professor Norris K. Smith expounds with sparkling lucidity an interpretation of Wright that not merely clarifies numerous hitherto apparently inexplicable facets of Wright's life and work, but deftly pulls the rug from under the whole cumbrous intellectual superstructure published so far in honor of the Master.

The chapter titles are, respectively: "The Cause Conservative," "Wright and Romanticism," "The Oak Park Years," "Crisis," "A New Beginning and Its Destruction," "Depression and Resurgence," and, finally, "Assessment." But the book is dominated by two grand themes. The first is that of the fundamental and dramatic antagonism that rends asunder the personality of any proselytizing nonconformist; for, obviously, the more he finds that success crowns his preaching, the less nonconformist he himself becomes. The second theme is the influence on 20th-Century architecture of non-Hellenic modes of thought. I shall not discuss the first theme, since any commentary might diminish the intensity of the reader's pleasure when confronted with Professor Smith's impeccably organized and inspiring prose. However, the second theme is susceptible of constructive comment, since it is more controversial than the author's plausible presentation may lead one to suppose.

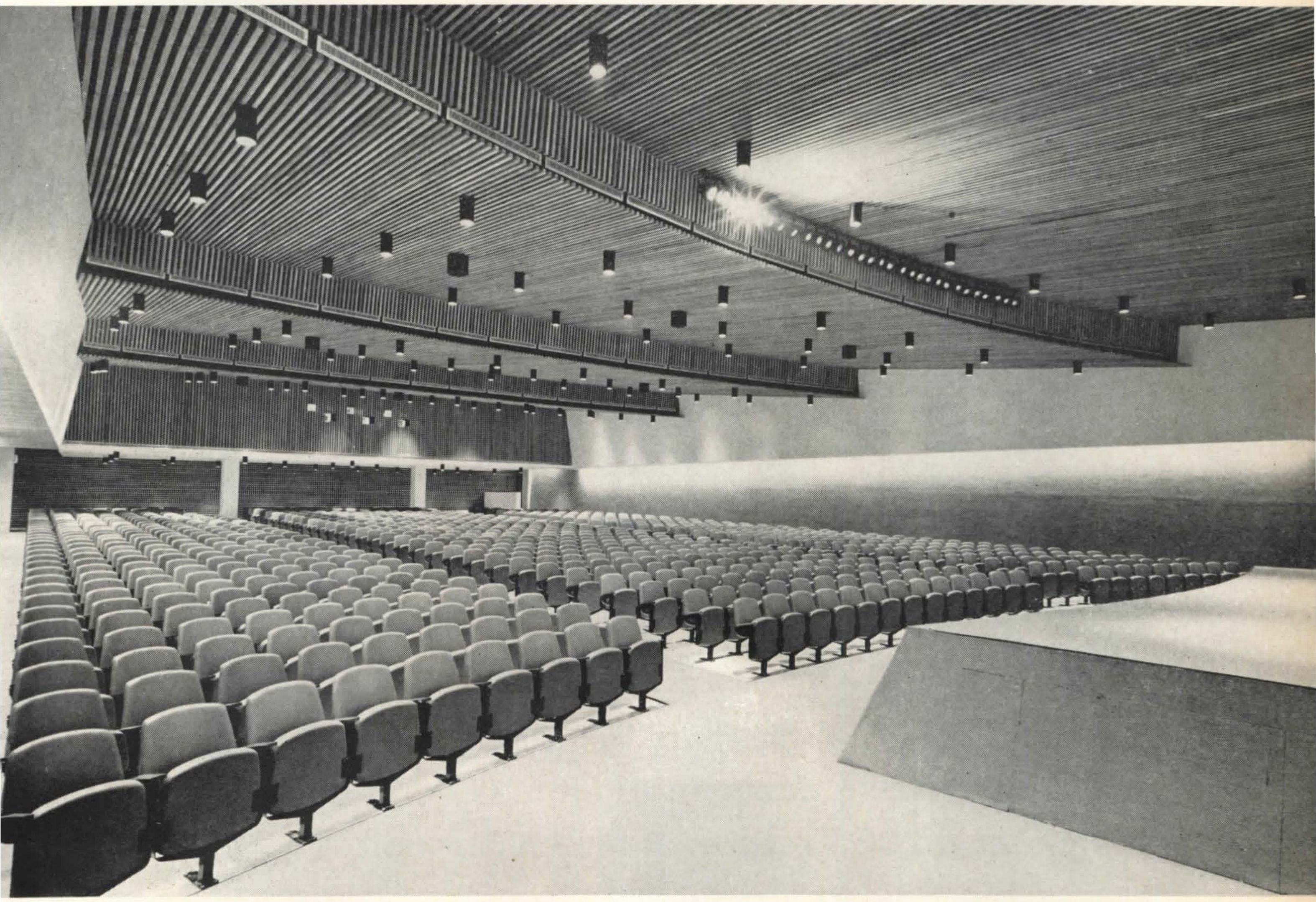
Basing his deductions on Thorlief Boman's *Hebrew Thought Compared With Greek* (a book originally written, it should be noted, in *German*), Professor Smith writes: "What I shall try to demonstrate is that [Romanticism and Classicism] derive from the two main sources of Western thought, the Hebrew and the Greek respectively" (p. 36). He then convincingly quotes Boman to show that the Greek concept of "being" implied something objective and inert, and the Greek concept of "form" implied tranquility, moderation, and the harmonious expression of the intellect, whereas the Hebrew concept of "being" implies *becoming* and "the Israelite finds the beautiful in that which lives and plays in excitement and rhythm" (p. 40). Professor Smith approvingly follows Boman in commenting that the beginning of St. John's gospel (which, in English, is translated as, "In the beginning was the Word," and, in German, as "Im Anfang war das Wort") is rendered by Goethe ("who goes back to the Hebrew [Aramaic] original," p. 56) as, "In the beginning was the Deed"—a curious sort of corroboration in that (a) Goethe was not exactly an authority on Aramaic, (b) St. John's gospel was written in colloquial Greek, and (c) the quotation is from the Poodle scene in *Faust*. But from all this, and much more evidence, Professor Smith concludes that "*Wright thought in Hebrew*" (p. 39).

Now it is incontestable that a person's thoughts are intrinsically affected by the language in which he thinks them, and thus one cannot thoroughly understand any architect's thoughts unless one is familiar with the language in which they were expressed. *But Wright, unlike St. John, not only shows no evidence of ever having thought in Hebrew; he was, if anything, rather antisemitic.* The phrases with which, in his *Autobiography*, he describes the Jewish draftsmen who were working for Adler (who was the son of a rabbi); his offensive description of Ottenheimer; even his taut reference to his Uncle Jenkin's friend Rabbi Hirsh, demonstrate this conclusively. How, then, are we going to reconcile Professor Smith's conclusions abstracted from Boman with the demonstrable facts concerning Wright's intellectual growth?

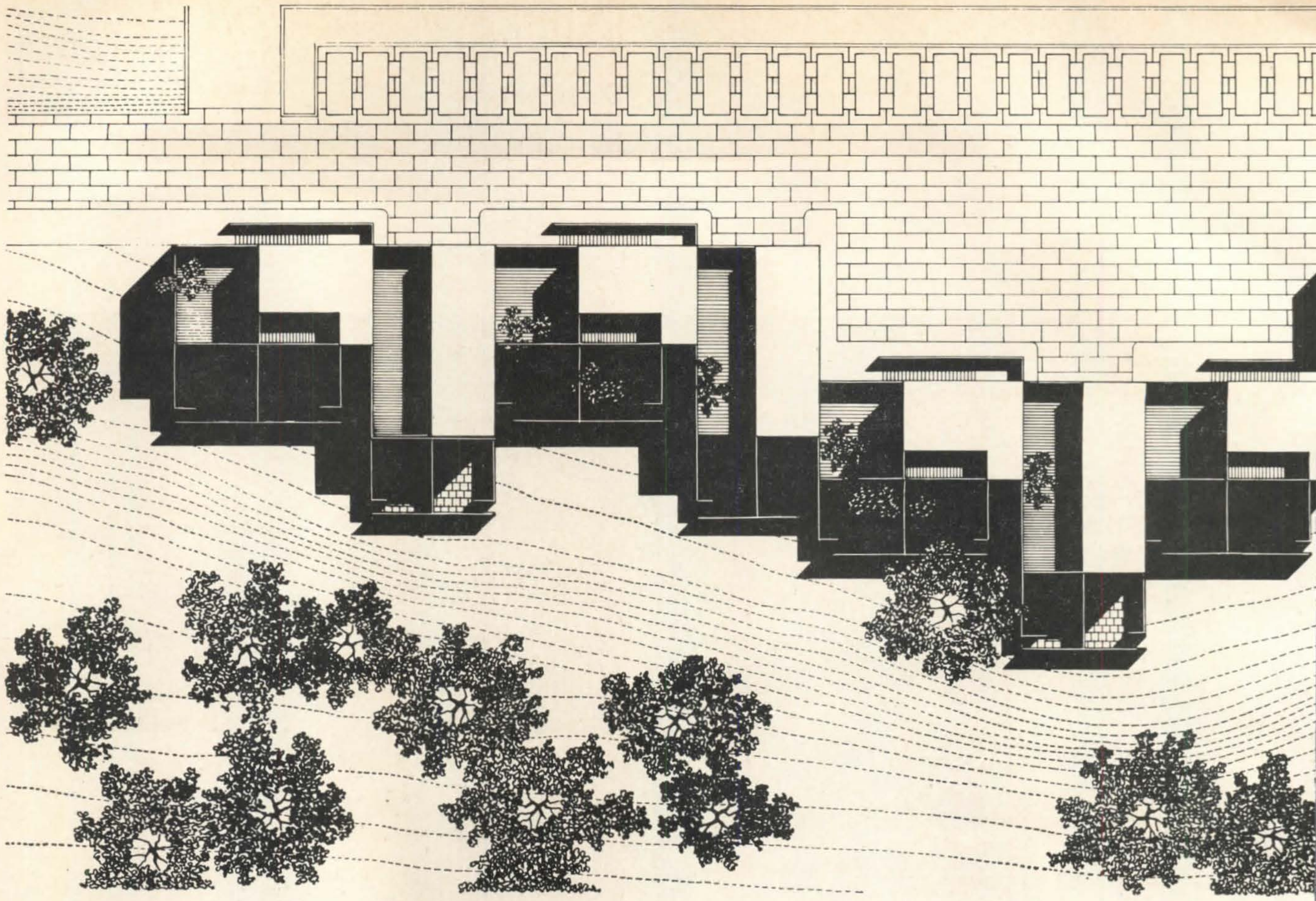
The solution of this dilemma is not, I think, hard to find; and, if correct, must have important implications for the historical interpretation of the whole evolution of contemporary architecture. My contention is that, whereas it is true that Wright and especially Sullivan were primarily stimulated by the writings of—or conversations with—Jewish intellectuals, both these men were essentially stimulated by *Germans*, whether of Jewish or Gentile blood; and though there may well be a large element of Jewish influence in 19th-Century German aesthetic philosophy (stemming, for example, from Moses Mendelssohn), it is not hard to prove that the more obviously non-Classical aspects of Wright's philosophy, of the Bauhaus philosophy, and indeed of Le Corbusier's philosophy, stemmed essentially from a century-old synthesis of German mystical and philosophical beliefs.

As regards Wright, he himself states in the *Autobiography* that he was mainly influenced by Carlyle, Coleridge, and Emerson; in other words, by the three 19th-Century writers most keenly engaged in promoting translations of German thought into English. As a young architect, he came under the influence of a superman who, from the beginning, he significantly refers to as *Lieber Meister*—a term of respect easy to understand when we realize how much Sullivan owed to his German-Jewish friends Edelmann and Adler. It was Edel-

*Continued on page 268*

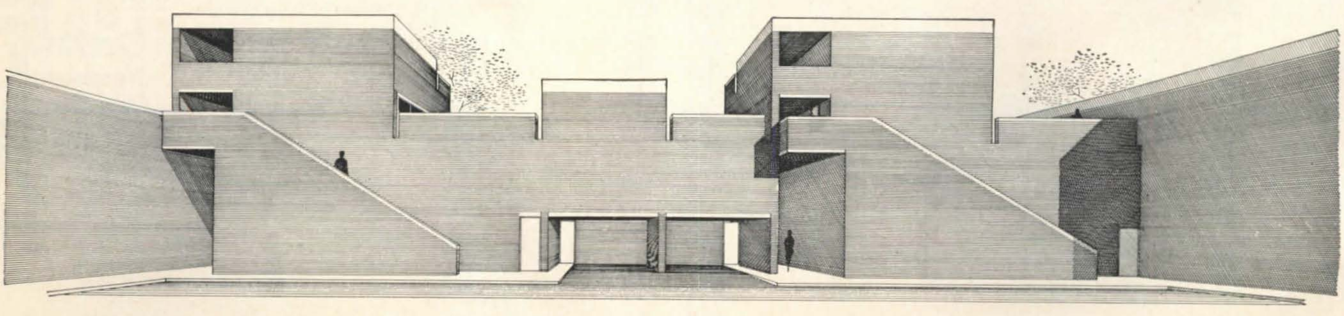


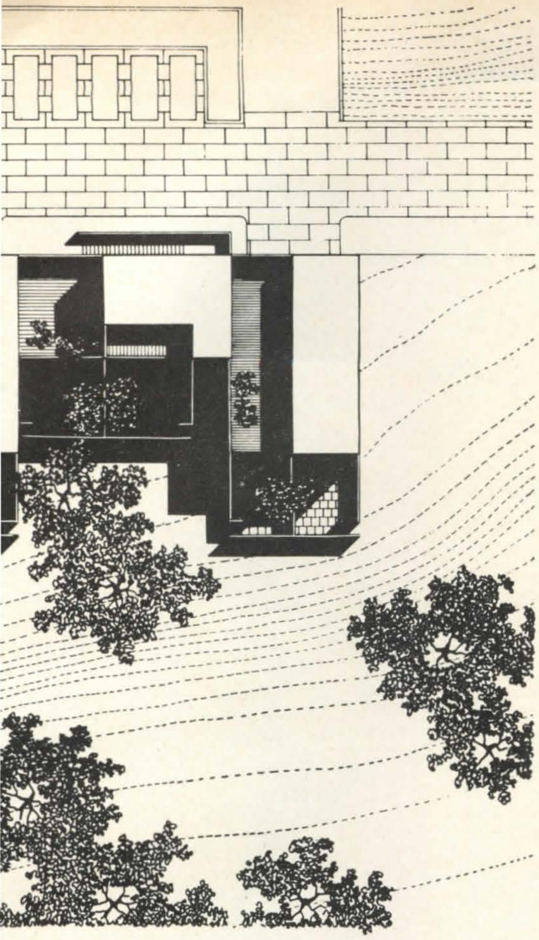
National Maritime Union • New York City • Albert C. Ledner, Architect



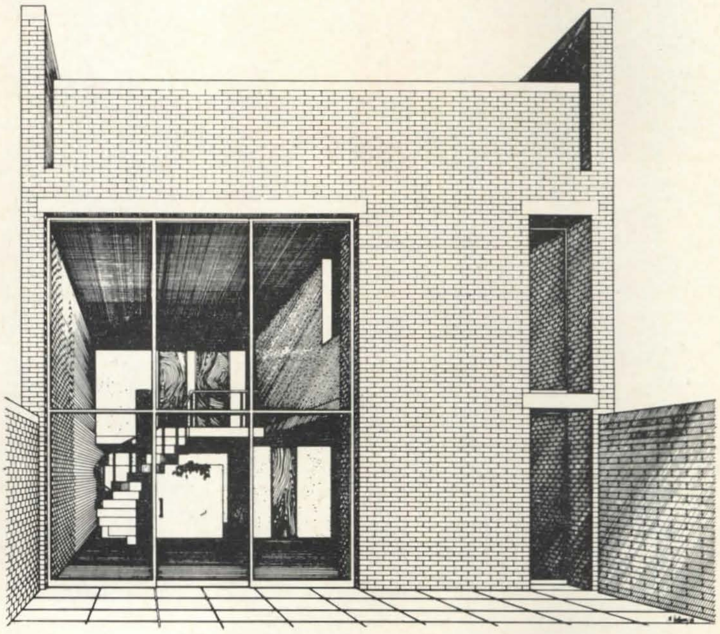
**Marvin Hatami designs an apartment house**

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





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



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

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

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

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

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

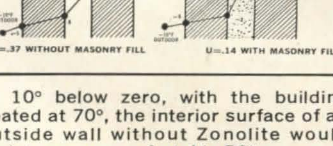
Masonry Fill also reduces initial building costs because smaller, more efficient heating units can be utilized. And because of the insulation's sound absorption qualities, each apartment is quieter.

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

**ZONOLITE**

**GRACE**

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




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

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

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

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

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



On Readers' Service Card, Circle No. 456



On Readers' Service Card, Circle No. 349 ➤

*Continued from page 262*
mann who taught Sullivan "the highest transcendentalisms of German metaphysics" (i.e., Kant's doctrine that the *Critique of Pure Reason* was an architectonic plan for a new science) and introduced him to Wagnerian opera, just as it was Edelmann who "led Louis to Adler" (*Autobiography of an Idea*). Sullivan certainly did not have much respect for Adler's racial origins, since he referred to him as a "short-nosed Jew"; but Adler obviously had a great influence on Sullivan's mind by introducing him to the works of Gottfried Semper. And Goethe, Wagner, Semper, Adler, and the Bauhaus all have this and only this in common—they were associated with Weimar.

In Professor Smith's final chapter, "Assessment," quoting Karl Löwith, he calls the Communist creed "a pseudo-morphosis of Jewish-Christian messianism." But it seems more important to emphasize that, although Karl Marx's father became a Christian and cut himself off from the Jewish community, Karl Marx thought and wrote in *German*. And it was the affinity of Marx's abstract politico-historical theories with the Teutonic philosophy of his age that made Wagner the leading exponent of the artistic implications of *The Communist Manifesto* and caused Gottfried Semper to flee from Saxony after the revolution for which the "Manifesto" was written and seek protection through the British Prince-Consort, Albert of Saxe-Coburg-Gotha. Indeed, when Semper published his first book (based on his experience in organizing the 1851 London Exhibition), this book, which was the ultimate source of Arts-and-Crafts philosophy, was written not in English but in German, and printed in Brunswick.

Professor Smith is absolutely convincing in his assessment of the reasons that prompted Frank Lloyd Wright, in 1909, to desert his family and architectural practice and go into voluntary exile in Europe. But I am less surprised than he that Wright handed over his practice to "a German-born architect who had no particular knowledge or sympathy for Wright's work." Nor am I surprised that when Wright left the shores of America, he went straight to . . . Berlin.



### *Precast Concrete Panels*

BY A. GYIMESI

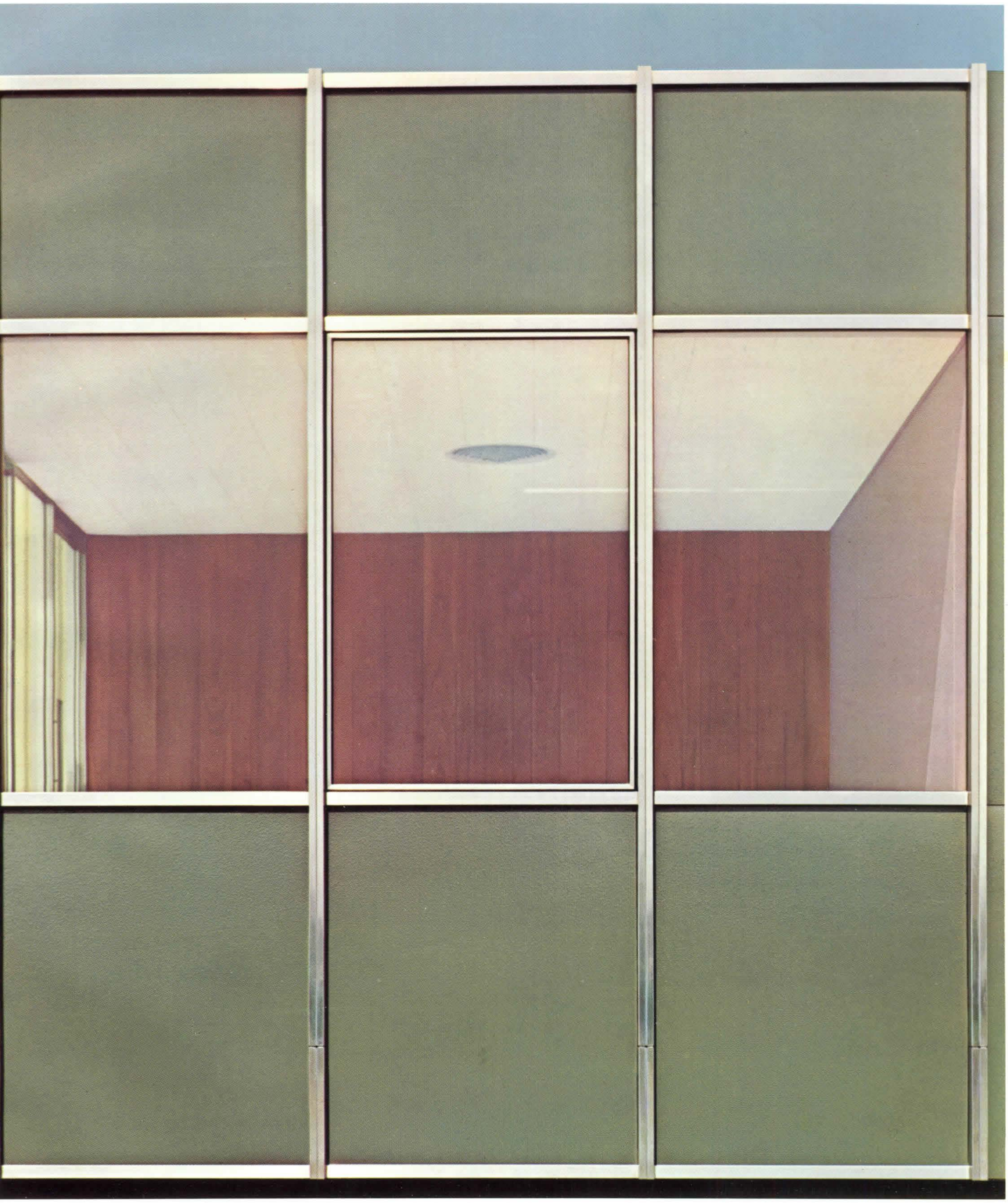
LARGE PANEL BUILDINGS. *By Gyula Sebestyen. Publishing House of the Hungarian Academy of Sciences, P.O.B. 149, Budapest 62, Hungary. 401 pp., illus., $12. The reviewer is Chief Engineer, Prestressed Concrete Division, Francon Ltd. (the concrete subcontractor for Habitat '67; see pg. 226.*

This book deals with methods of housing and apartment block construction using large precast elements. It provides a systematic survey of the experience gained in the past 10 years in Hungary, the Soviet Union, East Germany, and also describes some French and Danish systems. The book gives a very good, if short, cross-section of many existing systems and describes all the problems of materials, structural design, and mechanical design. It also discusses the questions of thermal and sound insulation, and production, erection, and assembly techniques. Finally, there is an attempt to evaluate the economy of the different methods; comparisons are made with traditional construction costs.

The chapter on materials concentrates on the various lightweight concrete aggregates, both natural and artificial. The shrinkage, strength, and thermal conductivity characteristics are discussed in

*Continued on page 276*

# Here, for the first time, a truly competitive stainless steel fenestration system (Turn page for the story)



## Announcing
## USS Ultimet

a truly competitive stainless steel fenestration system that is available *now* for architectural applications—for new construction or building renovation.

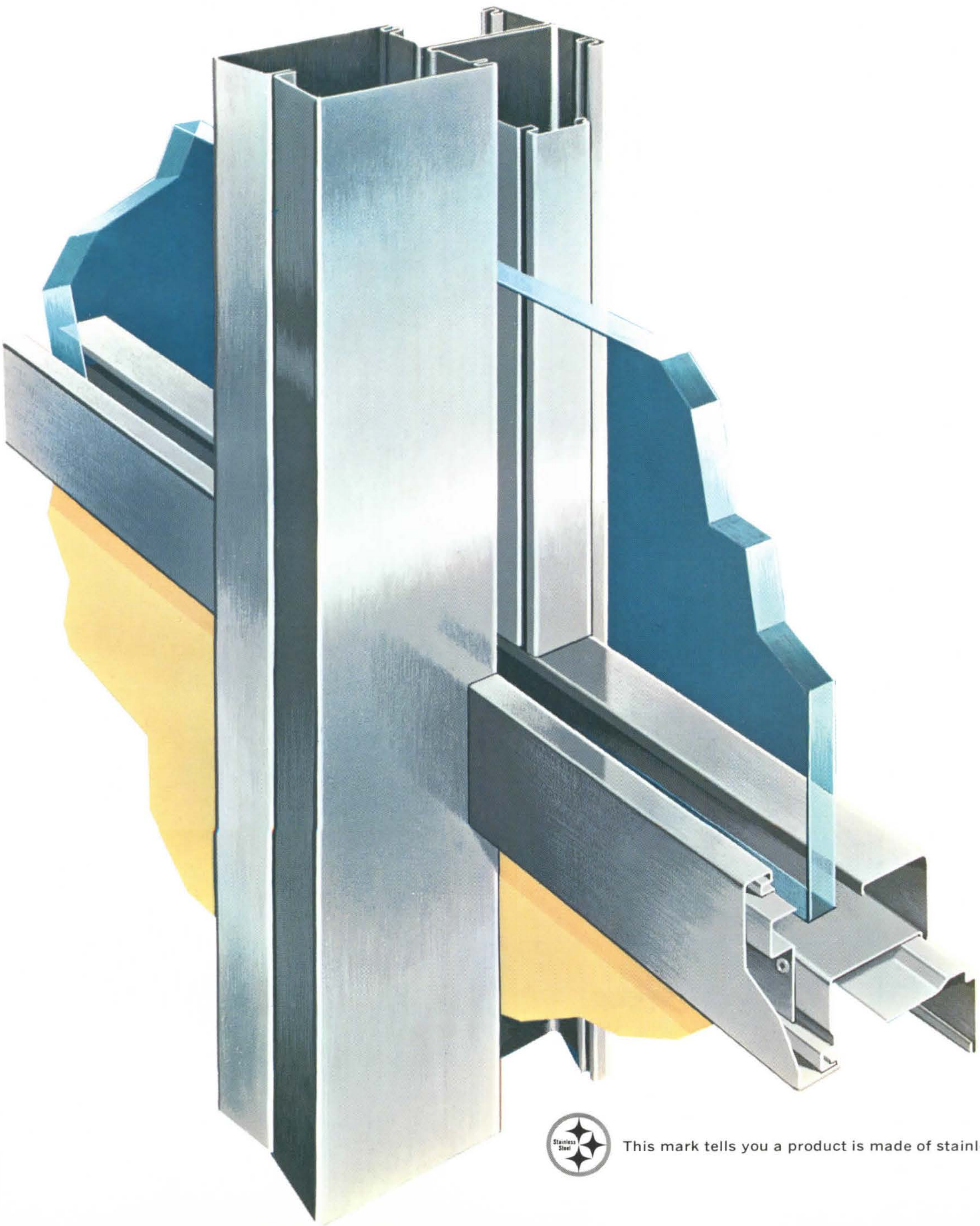
USS ULTIMET Stainless Steel Wall Framing is an entirely new architectural design concept which takes advantage of modern manufacturing methods. ULTIMET components give the architect a completely integrated series of structurally efficient and easily fabricated and erected stainless steel shapes that lend themselves to a great variety of architectural expressions and applications.

All USS ULTIMET shapes are roll-formed, to make the best use of Type 304 stainless steel's remarkable properties. This permits economic achievements in the structural design, fabrication and erection of stainless steel curtain walls never before possible. Roll-forming also results in closer tolerances than possible with conventional custom manufacturing methods. This is one of the reasons why USS ULTIMET components can be erected more simply and quickly than any previous stainless steel wall framing system.

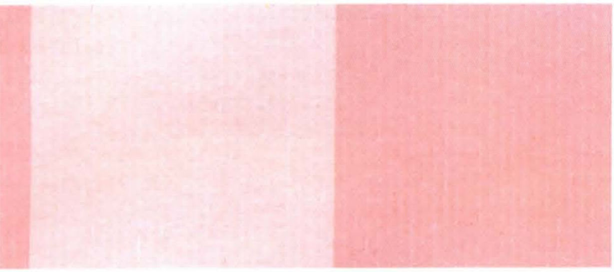
Only seven basic shapes are required to provide a variety of architectural treatments. The abrasion- and dent-resistant components are fabricated and shipped "knocked down" to the job site, ready to erect. Joining costs are minimal because precise part-to-part uniformity assures mate-fitting of all shapes. There are no exposed fasteners—no welding. In fact, most of the members simply lock into place. USS ULTIMET framing allows for normal thermal and building movement. The system controls water infiltration because of its built-in drainage feature. Glass and infill panels can be installed from either the inside or the outside of the building.

USS ULTIMET framing is here now! It is competitive! Components are readily available from inventories maintained by United States Steel.

USS ULTIMET . . . the ultimate in curtain wall simplicity and excellence



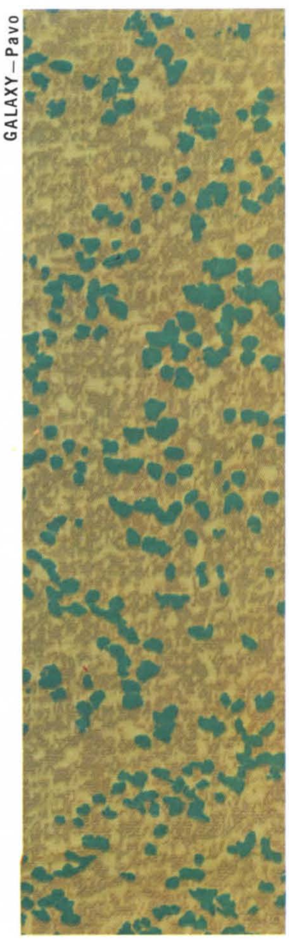
This mark tells you a product is made of stainless steel.



We meant it when we promised to bring you exciting designs, creative textures . . . a new dimension in style and color for quality vinyl wallcoverings.

# a new concept in wall styling!

GALAXY—Pavo



ARUBA—Parrot Green

Complete with new U.L. listing. Also available with a top-bonded film of TEDLAR*. These freshly minted designs in PERMON, FABRON and DETRON come in a bountiful array of decorator colors, tones and blends. Veritable spectra of color to whet the imagination! Stauffer wallcoverings now also include the complete VINCO line. Next time you visit New York's Decoration and Design Building, see all our new vinyl wallcovering designs and textures in full color range. For samples, write to Stauffer Chemical Company, Wallcoverings and Upholstery Sales, 979 Third Avenue, New York, N.Y. 10022.

*DuPont's registered trademark for its polyvinyl fluoride film.

**STAUFFER CHEMICALS . . . at work everywhere**

Stauffer CHEMICALS

**permon® / fabron® / detron®**

and now... **VINCO™** vinyl wallcoverings

*Continued from page 268*

great detail. This is followed by a short description of plastics used as building materials.

The following chapter discusses architectural and structural design. Surprisingly, there was a time, about five or eight years ago, when a whole building industry was built around intermediate-size panels. These panels are between the size of a brick and a full story-high wall panel. The panels were a third or half a story high and their existence was justified by the limited capacity of cranes available in some countries. Even brick walls and brick pilasters were prefabricated and erected on the job site, one-half story high. The need for temporary lateral support, and the extra joints and double handling required, turned out to be more costly than the initial investment in heavier cranes, so that design and manufacturing of intermediate-size building blocks were abandoned.

The most important part of the book discusses the large panel systems that are one-story-high units. They are divided into two-dimensional flat panels, three-dimensional box units, and precast buildings made up by frames. Many Eastern and Western examples are cited. Systems of vertical and horizontal joints, both from the point of view of weathering and of structural detail, are shown in great number. Special emphasis is given to the articulation of external walls, dimensional coordination and modular design, connection details between the loadbearing units and partition walls, window and door details, staircases, balconies, corners and gable walls. The connections, perhaps the most important part of these systems, are well detailed.

A separate chapter discusses the problem of services: plumbing, electricity, mechanical equipment, and the intricate design of special precast units that contain these mechanical services.

Beside regular and lightweight concrete, there are several other materials in various layers incorporated in the multilayer sandwich panels: insulation materials, terra cotta, and sound insulation of organic origin.

The method of manufacturing the large precast concrete elements is described and divided into two main methods: (a) the concrete plant is stationary and the mold moves; (b) the molds are stationary and the concrete is carried to them. Each system has its merits and a description is given of the economy and drawbacks. Typical plant layouts are shown. Various layouts for steam-curing chambers and autoclave equipment are described. The merits of pouring wall panels horizontally and tilting up later, or pouring the panels in vertical battery forms, are compared.

Cranes and handling equipment are compared and tabulated. Mobile, tower, crawling, gantry, and climbing cranes are shown on several big projects; also, some smaller devices for lifting and clamping are described.

Also discussed are the job site construction method and organization of the site, the storage and handling of the units, hauling and temporary bracing after erection, and scaffolding and safety procedures.

The book concludes with a chapter on the economy of prefabrication. The use of large precast units and system buildings can only be justified if they can be shown to be more economical than building with traditional methods. This is a most difficult problem and the economic calculations shown are far from convincing. In addition, there is little or nothing written about high-rise apartment buildings, earthquake design problems, and

*Continued on page 284*

Monticello, a 35-room structure on a 658-acre tract atop a lofty plateau in the Blue Ridge Mountains of Virginia. Begun in 1769, it developed over 40 years in the Greco-Roman-Colonial style. Its dome inspired those built later on the U. S. Capitol and the Jefferson Memorial in Washington. Jefferson was as much an avant-gardist as Frank Lloyd Wright was to become generations later.

# Using ink—and no eraser—Jefferson held to a tolerance of .4127"—without Castell

There may be a contemporary genius to match Thomas Jefferson, but nobody has ever met him.

He designed his beloved Monticello, quarried the stone, cut the timber, made the bricks and the nails and supervised the construction. In between, he found time to indulge his hobbies as an accomplished violinist, dancer and horseman. He practiced law, was elected to the Continental Congress, became Governor, Secretary of State, Vice President and President.

Unless you are a genius and have 40 years to work on a project, you will do better with CASTELL drawing pencils and MAGIC-RUB erasers. CASTELL in 20 uniform degrees, 8B to 10H, lay down bold, black lines that do not fade, skip or vignette. A natural crystalline allotropic carbon with a low index of friction lets you work smoothly, effortlessly. CASTELL-Sealed bonding of lead-to-wood gives points a 50% higher than average breaking strength. Erases without a trace, reproduces clean and clear.

If there were no other precision tools available today, CASTELL #9000 alone could give wings to your creative ability—whether you are an engineer or architect, a designer or draftsman. CASTELL will add skill to your hand. Call your Dealer.

See reverse side for other fine CASTELL drafting products.


A.W. FABER-CASTELL-HIGGINS


## Specs for the most important working tools of your profession

1 **CASTELL #9000** wood pencil: 20 degrees—8B to 10H. Made with finest graphite that tests to more than 99% pure carbon, assures maximum opacity without oily additives. Reduces smudges and stains on all drawing surfaces. Low index of friction lets you work smoothly, effortlessly. Castell-Sealed lead-bonded-to-wood process gives points a 50% higher than average break-resisting strength. Lays down solid, graphite-saturated lines that won't flake or feather.

2 **CASTELL #9007** Eraser Tipped Drawing Pencil made in 11 degrees, 3B to 6H. Extensively used by professionals, it is considered the world's finest writing pencil. Widely favored by executives because of its superb smoothness, extrafine quality, wide range of lead hardness choice, and long wearing point.

3 **CASTELL LOCKTITE #9400** drawing lead holder same as Locktite Tel-A-Grade in basic parts, and quality. Has serrated non-slip finger grip on plastic barrel. Our ever popular Model T—a great value. 19 degrees, 7B to 10H.

4 **CASTELL #9030** Black refill drawing leads for Locktite and all standard lead holders. Same quality and companion to world-famous Castell wood drawing pencil. 19 degrees, 7B to 10H. Packed in green plastic tube with gold cap.

5 **CASTELL 9201 POLYCHROMOS** Crayon Pencils offer a complete range of 72 pigment colors—bright, beautiful and light-proof—for sketching, drawing, rendering and map making. Widely used by artists, architects, designers, draftsmen, and engineers for any coloring required.

6 **No. 1960 PEEL-OFF MAGIC-RUB** vinyl composition eraser, paper-wrapped in pencil shape. Ideal for detail erasing on drafting film. Rolls up graphite in long strips without smudging, smearing or damaging film surface.

7 **REMARKABLE NEW HIGGINS TECHNICAL CARTRIDGE PEN,** available in sets of eight or individually boxed with 2 BLACK MAGIC India Ink cartridges. An adapter also makes it a self filling pen. *Only Technical Pen of its kind on the market.* With fast drying Higgins BLACK MAGIC India Ink in each cartridge, you need never fill a pen again unless *you* want to. Its practical versatility should make this new Higgins pen your first choice.

8 **No. 7041 CASTELL PARAWHITE** soft, pliable drafting eraser. Moistureless formula virtually eliminates smears, stains or smudges. Erases graphite marks quickly and cleanly without damage to drawing surfaces.

9 **MENTOR #50/58** Dual Pencil and Lead Sharpener. Made of brass with 3 tempered steel blades—one to remove the wood, the second to put a long sharp point on the lead and the third to point refill leads used in holders.

10 **HIGGINS BLACK MAGIC INDIA INK** solves the "Black" problem once and for all, and still stays wet and fresh in the pen. Opaque, blackest black possible, no chipping, belling, feathering. Erasable on film with a moist MAGIC-RUB Eraser. Fast drying, smearing is no longer a problem. Available in newly packaged Higgins 3/4 oz. bottle and in cartridges, for use in our new Higgins Technical Cartridge pen.

11 **No. 4050 BRASS DRAWING LEAD POINTER** made exclusively for pointing refill drawing leads. Will provide a long sharp point on all diameters of leads from 8B to 10H inclusive. Has second opening for sharpening thicker, softer leads and crayons.

**A.W. FABER-CASTELL**

**Pencil Company, Inc., 41 Dickerson Street, Newark, N.J. 07103**

**A.W. FABER-CASTELL Pencil Company, Inc., 41 Dickerson St., Newark, N.J. 07103**

**Please send me a sample each of the following for testing purposes.**

**CASTELL #9000 Drawing Pencil** ________________ **degrees.**

**CASTELL #9030 Refill Drawing Leads** ________________ **degrees.**

**HIGGINS Black Magic India Ink** ☐

**MY NAME IS** ________________ **TITLE** ________________

**COMPANY** ________________ **STREET** ________________

**CITY** ________________ **STATE** ________ **ZIP** ________

On Readers' Service Card, Circle No. 426

May we send you brochures on contemporary, traditional and ultramodern wood office furniture?

**jofco**
DEPT. 310, JASPER, INDIANA

SHOWROOMS: Los Angeles, Raub & Robinson, 1608 East 15th Street • Fort Worth, L. H. McDaniel & Son, 420 So. Ballinger • New York, Jofco, 16 E. 53rd, Chicago, Jofco, 1109 Merchandise Mart.

# "Flexibility to meet any tenant requirements . . . prime factor in our choice of steel framing"

**Norman Leventhal, President, and Robert Leventhal, Treasurer, Beacon Construction Company, owner and builder of One Center Plaza, Boston's "Horizontal Skyscraper"**

"Our initial design for One Center Plaza called for a framing material other than steel. However, we discovered that steel framing allowed us to offer prospective tenants office space uniquely suited to their particular needs. Modifications, such as additional stairways, increased floor load capabilities, and other space adaptations, could be incorporated *after* the main framework was completed.

"Another advantage in steel construction was that it allowed us to work right through the fall and winter, making possible earlier completion and earlier occupancy.

"The relatively light weight of steel framing minimizes foundation reinforcement problems. Also, we found steel particularly well-adapted as a framing for precast exterior panels.

"The use of steel framing in the construction of One Center Plaza has been most advantageous for Beacon and its tenants, both in terms of construction features and cost savings."

**BETHLEHEM STEEL**

*Bethlehem Steel Corporation, Bethlehem, Pa.*

BETHLEHEM STEEL

This is how One Center Plaza, located in Boston's new Government Center, will look when completed. Its 8 floors provide 600,000 sq ft of floor space.

Steel

*Architect:* Welton Becket and Associates. *Consulting Engineer:* Wayman C. Wing. *Steel Fabricator:* West End Iron Works. Bethlehem is supplying about 5,000 tons of structural steel for this building.

*Continued from page 276*

construction tolerances.

The general make-up of the book is very good, the type clear, and the diagrams easy to follow. Many good photographs are included, but it is remarkable how often these pictures depict a very poor quality of finishing work on the panels. The book abounds with ideas and is recommended for anyone interested in large panel systems and the coming industrialization of apartment construction.

### *Specifiers Beware*

BY PETER ANDES

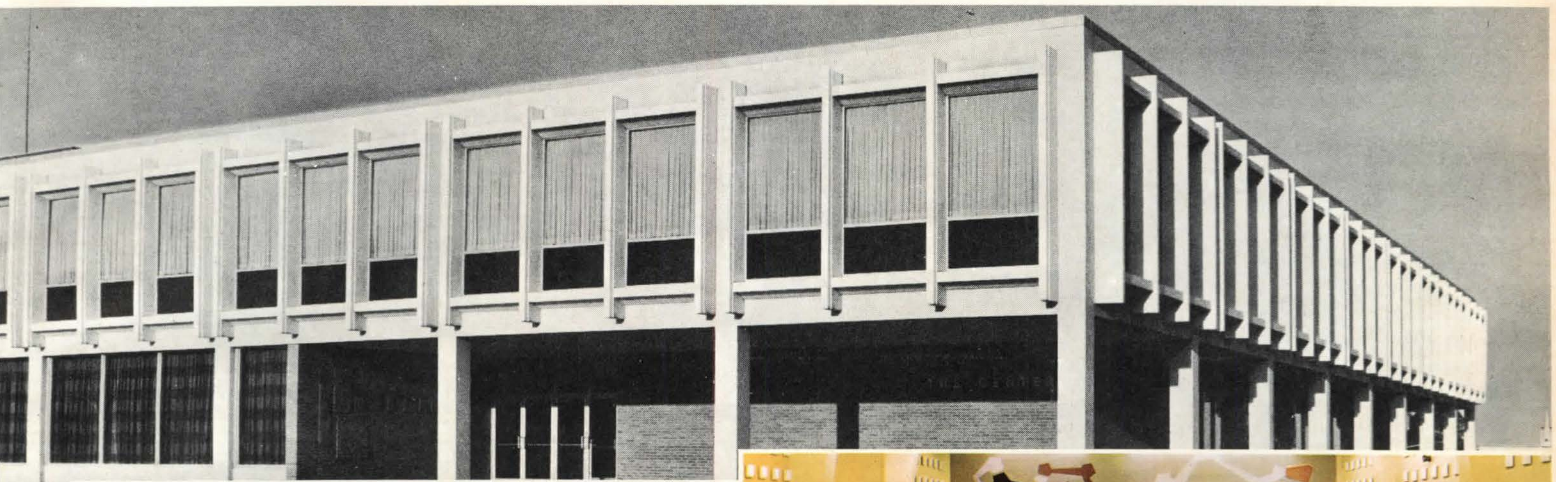
THE ECONOMICS OF CARPETING AND RESILIENT FLOORING, AN EVALUATION AND COMPARISON. *By George M. Parks. Industrial Research Unit, Wharton School of Finance and Commerce, U. of Pennsylvania, Philadelphia, Pa. 19104, 1966. 87 pp., $2.50 (cloth) $1.50 (paper). The reviewer is a Project Manager for I.S.D., an affiliate of The Perkins & Will Partnership, architects.*

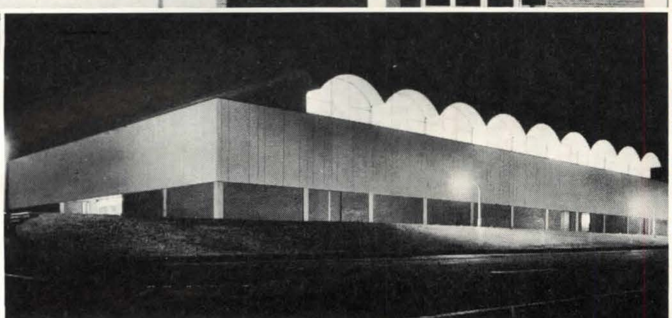
This book does not live up to its title. Webster's Seventh Collegiate Dictionary defines economics as "description and analysis of the production, distribution, and consumption of goods and services." This study was undertaken as a teaching example of business requirements for a postgraduate course at the University of Pennsylvania's Wharton School of Finance and Commerce. The aim was to determine which costs more—carpeting or resilient flooring. The conclusion was: "Under all conditions investigated, the total annual cost for resilient flooring is less than that for carpeting." (Annual cost is defined as the installed cost and maintenance divided by the estimated service life.) The increased annual cost of carpeting was found to vary between 125 per cent and 270 per cent.

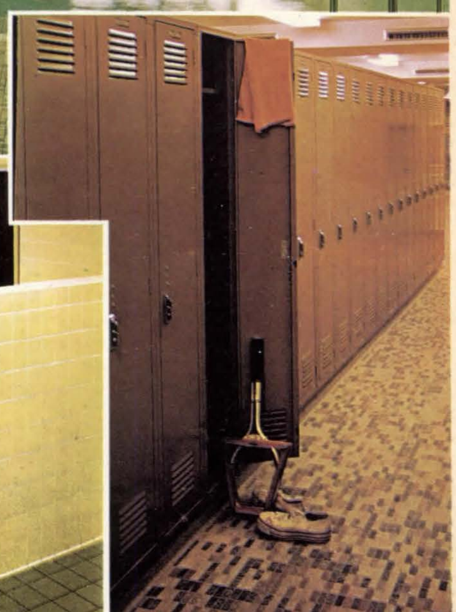
The economics of carpeting and resilient flooring is of vital interest to all specifiers of interior finishes. Leaving aside the more subtle aspect of how these products may affect other products (china breakage, acoustics, mobility of functions, etc.), a study of the subject would be invaluable if it only examined the "production, distribution, and consumption" of these two diverse products. What is presented instead, however, is the technique of examining relative costs. To this end, many readable and informative tables and charts concerning "amortized cost of equipment, frequence of maintenance operations," etc., have been developed. These will be of great value to those who wish to quote an authority in order to win a point.

*Continued on page 294*

# Epple and Seaman utilize ceramic tile n campus rejuvenation at Newark College of Engineering.







Two new buildings on this New Jersey npus make extensive use of ceramic tile its functional and decorative characteres. Shown here are areas in the new "Stunt Center" and the "Franklin Newlin twisle Physical Education Building." The er has an interior finished almost entirely ceramic tile. A focal point is the abstract amic mosaic mural which covers one ene wall of the natatorium. A smaller mural corates the opposite, entrance wall.

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

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

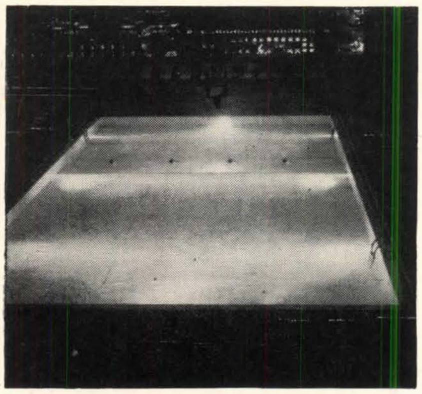
f you're looking for a material with limitless possibilities in combined decorative and ctional use, look for ceramic tile made in the U.S.A. and Quality Certified by the Tile uncil of America. The triangular seal at right is your assurance of glazed wall tile, amic mosaic tile and quarry tile that is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

QUALITY CERAMIC TILE MADE IN U.S.A. · CERTIFIED BY TILE COUNCIL OF AMERICA, INC. · TCA

MBER COMPANIES: American Olean Tile Co., Inc. • Atlantic Tile Manufacturing Co. • Cambridge Tile Manufacturing Co. • Carlyle Tile Company • Continental Ceramic Corporation ida Tile Industries, Inc. • General Tile Company • Gulf States Ceramic Tile Co. • Highland Tile Company • Hoffman Tile Mfg. Co., Inc. • Huntington Tile, Inc. • International Pipe Ceramics Corporation • Jackson Tile Manufacturing Co. • Jordan Tile Manufacturing Co. • Keystone Ridgeway Company, Inc. • Lone Star Ceramics Co. • Ludowici-Celadon Company shall Tiles, Inc. • Mid-State Tile Company • Monarch Tile Manufacturing, Inc. • Mosaic Tile Company • Oxford Tile Company • Pomona Tile Manufacturing Co. • Sparta Ceramic npany • Summitville Tiles, Inc. • Texeramics Inc. • United States Ceramic Tile Co. • Wenczel Tile Company • Western States Ceramic Corp. • Winburn Tile Manufacturing Co.

A four-pipe system isn't always the answer.

# Want extra space for a pool and a garage?



Then consider a General Electric Zoneline heating/cooling system. The way architects Nowicki & Pollilo did with the William Penn House, Philadelphia, Pennsylvania, shown here.

G-E Zoneline gives you all the benefits of a four-pipe system. But, because it does away with pipes, ducts, boilers and cooling towers, it frees space—for a garage in the basement or a pool on the roof or both.

Other benefits:

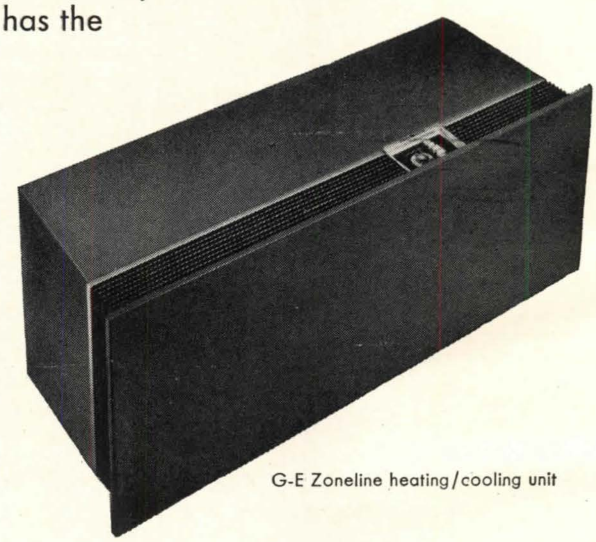
**FIRST COST** can be cut drastically. The General Electric system used for William Penn House was much less than estimates for a four-pipe system.

**ROOM-BY-ROOM CONTROLS** enable a tenant who is chilly to turn on the heat, even though everyone else has the air conditioning on.

**CHOICE OF GRILLWORK** is one you make. G-E Zoneline grille comes in two standard designs or can be treated architecturally to blend with building appearance.

**INTERIOR FLEXIBILITY** allows you to fit units over doors (Marina Towers, Chicago) or under window seats (Century House, Lincoln, Nebraska).

From motels to high-rise construction, Zoneline systems can make dramatic economies in space and first cost. Call your General Electric Zoneline Air Conditioning Representative for the facts.



G-E Zoneline heating/cooling unit

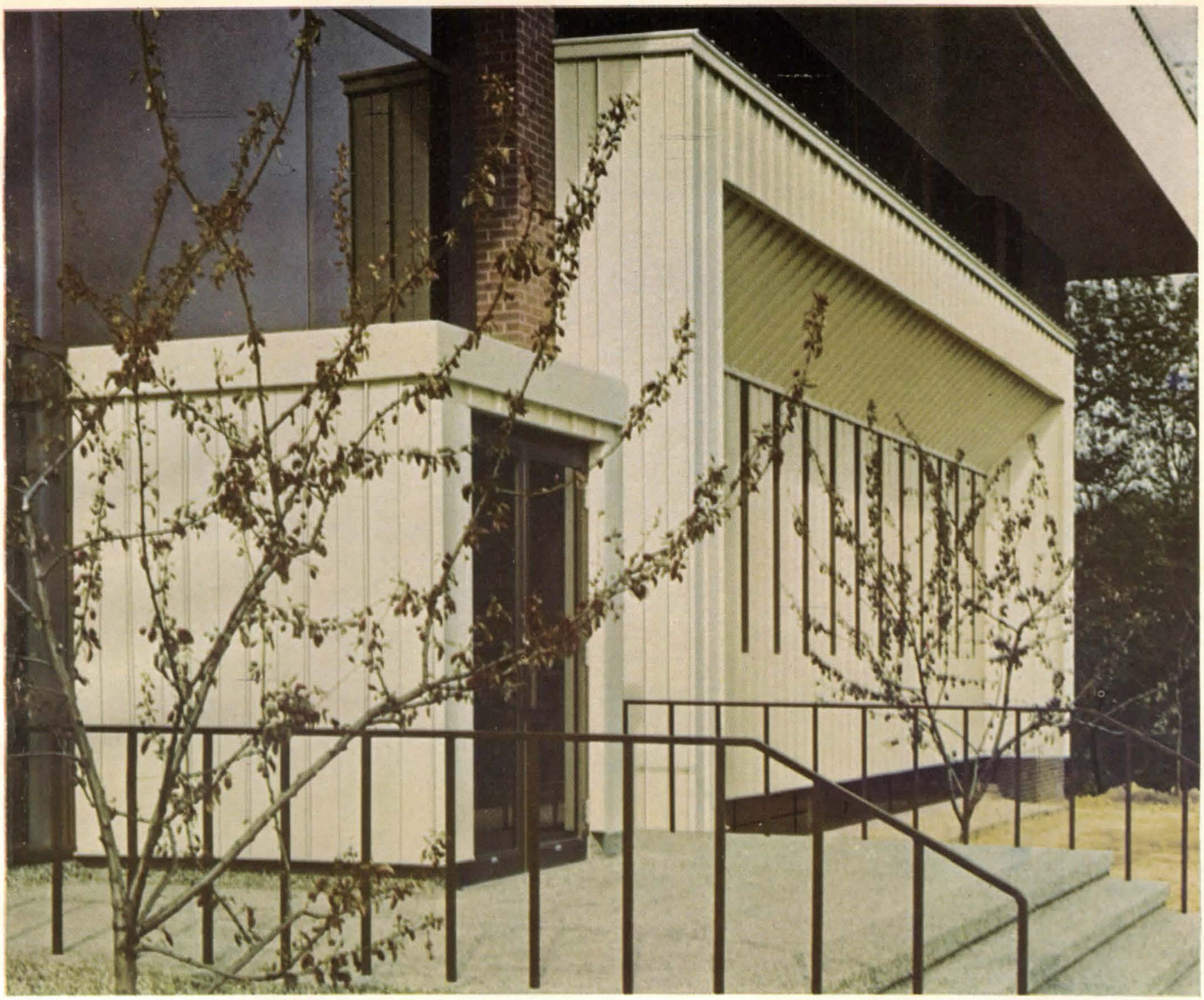
Air Conditioning Department, Appliance Park, Louisville, Kentucky

**GENERAL ELECTRIC**

On Readers' Service Card, Circle No. 363

Owner: William Penn House, Inc.
Architect: Nowicki & Pollilo
General Contractor:
E. J. Frankel Enterprises

We've got the best legs in the office.
Square. But beautiful.
And by collaborating with Knoll (the most honored designers in the field), we made sure they not only look good but work well.
On our 500 line desk we use 16 gauge polished or brushed chrome steel on the outside. Then strengthen each leg with a 14 gauge "U" channel inside. Makes the desk solid as a rock. So if you're a desk pounder, pound away. It'll never shimmy or shake.
And since no floor is absolutely level, we've added an inconspicuous foot lever to each leg. Lets you raise or lower the desk as little as 1/32 of an inch with each quarter turn. Also, as it turns, it snaps into position. Always square with the clean line of the leg.
Everything about our 500 line desk is made the way office furniture ought to be. Furniture that looks beautiful and works beautifully—a solid investment for the management who pays for it.
ART METAL INC
JAMESTOWN, NEW YORK



New office building of Elwin G. Smith & Co. Inc., Pittsburgh, Pa., has exterior metal protected with Fluropon†, made with Kynar 500.

# Today's revolution in long-life finishes starts with KYNAR* 500

**Kynar 500 is a new Pennsalt fluoroplastic used by leading paint manufacturers in formulating revolutionary new exterior finishes for metal siding, window frames, mullions and trim.**

- **long life—tests made by Pennsalt project 30 years or more of useful, maintenance-free life.**
- **perfect color match—finishes are liquid, can be roller-coated on flat stock and post-formed, or sprayed on contoured components.**
- **excellent color retention—tough, weather-resistant surface resists fading and chalking. Standard and custom colors available.**
- **lowest cost—finishes made with Kynar 500 cost less per square foot than porcelain enamel or top grade anodized aluminum.**

**Get complete information, including test data and cost comparisons, by writing for our 12-page brochure. Plastics Department, Pennsalt Chemicals Corporation, 3 Penn Center, Philadelphia, Pa. 19102.**

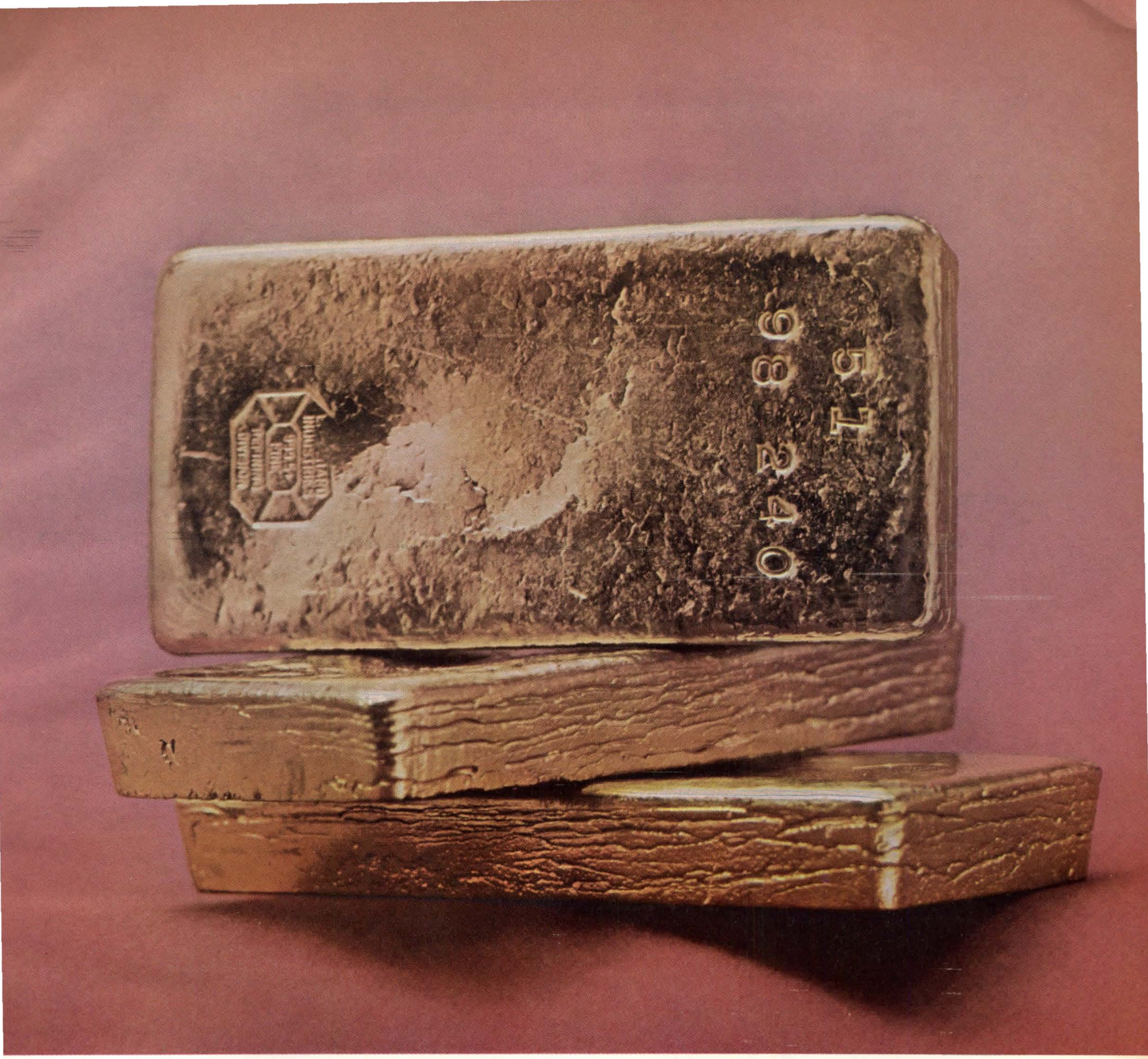
**Kynar is a registered trademark of Pennsalt Chemicals Corporation.*
*Kynar 500 is a grade of Kynar used in making long-life finishes.*
*†Fluropon is a trademark of De Soto Chemical Coatings Inc.*

PENNSALT®

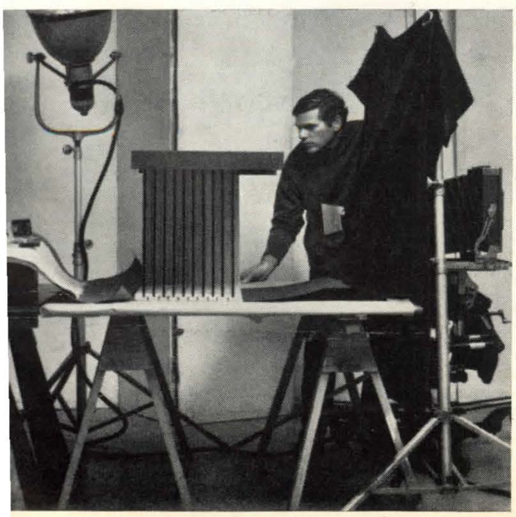


On Readers' Service Card, Circle No. 413


Glazed Brick for the price of Face Brick
I don't believe it
It's true. Now you can have a glazed brick building for the same price as face brick when you specify HANLEY Jumbo Norman Glazed Brick.
Let's be fair. If you use common face brick as a comparison we'd lose. But take a good quality standard face brick (8″ x 2¼″ x 3¾″), buff or grey, compare "in wall" cost with HANLEY Jumbo Norman Glazed Brick (11⅝″ x 2¾″ x 3⅝″), and more often than not, the price will be the same or even less.
Think of it, now you can have all the advantages of Glazed Brick and not pay a premium price. If you're still in doubt ask your HANLEY representative to prove it.
HANLEY COMPANY
Summerville, Pennsylvania
District Sales Offices
New York • Buffalo • Pittsburgh
Distributors: Nationwide and Canada



## You're looking at $10,457.05 through ten pieces of PPG Float Glass



The glint and glimmer that lured knaves and heroes come through as though there were nothing between you and these 298.773 ounces of fine gold—the international standard against which all value is measured.

That's because the glass is PPG Float, the new standard of perfection against which all glass will be judged.

We make it by floating liquid glass on a bath of molten metal. You see the results: a glass with new depth of clarity and brilliant surfaces.

PPG Float Glass is available now. For specification data contact your PPG Architectural Representative or write: Pittsburgh Plate Glass Company, One Gateway Center, Pittsburgh, Pennsylvania 15222.

**PPG makes the glass that makes the difference**

This is how the gold bars were photographed through ten pieces of PPG Float Glass. Courtesy of Engelhard Industries, Inc.

On Readers' Service Card, Circle No. 415

PPG-72283

*Continued from page 284*

In addition, an appendix offers a comparison with studies made by the American Carpet Institute (1963) and Armstrong Cork (1965), the latter of which helped support the data collection procedures against which its own report was compared.

Throughout the study, resilient flooring is limited to asphalt, vinyl, and vinyl asbestos. Why not cork or wood? Carpets are compared only by means of price or, occasionally, content (wool vs. nylon). Is construction so irrelevant? Correspondingly, no carpet techniques such as felting or flocking, of fibers, such as acrylic or rubber, were tested. Such a book is of interest only insofar as it examines all significant data; the limited data examined and didactic point of view fail to fulfill the promise of the title.

### *From Aristotle to Abercrombie*

BY RICHARD P. DOBER

THE NEW TOWNS: THE ANSWER TO MEGALOPOLIS. *By Frederic J. Osborn and Arnold Whittick. Introduction by Lewis Mumford. McGraw-Hill Book Co., 303 W. 42 St., New York, N. Y., 1964. 376 pp., illus., $12.50. The reviewer is an architect with Dober Walquist & Harris, Inc., Cambridge, Mass.*

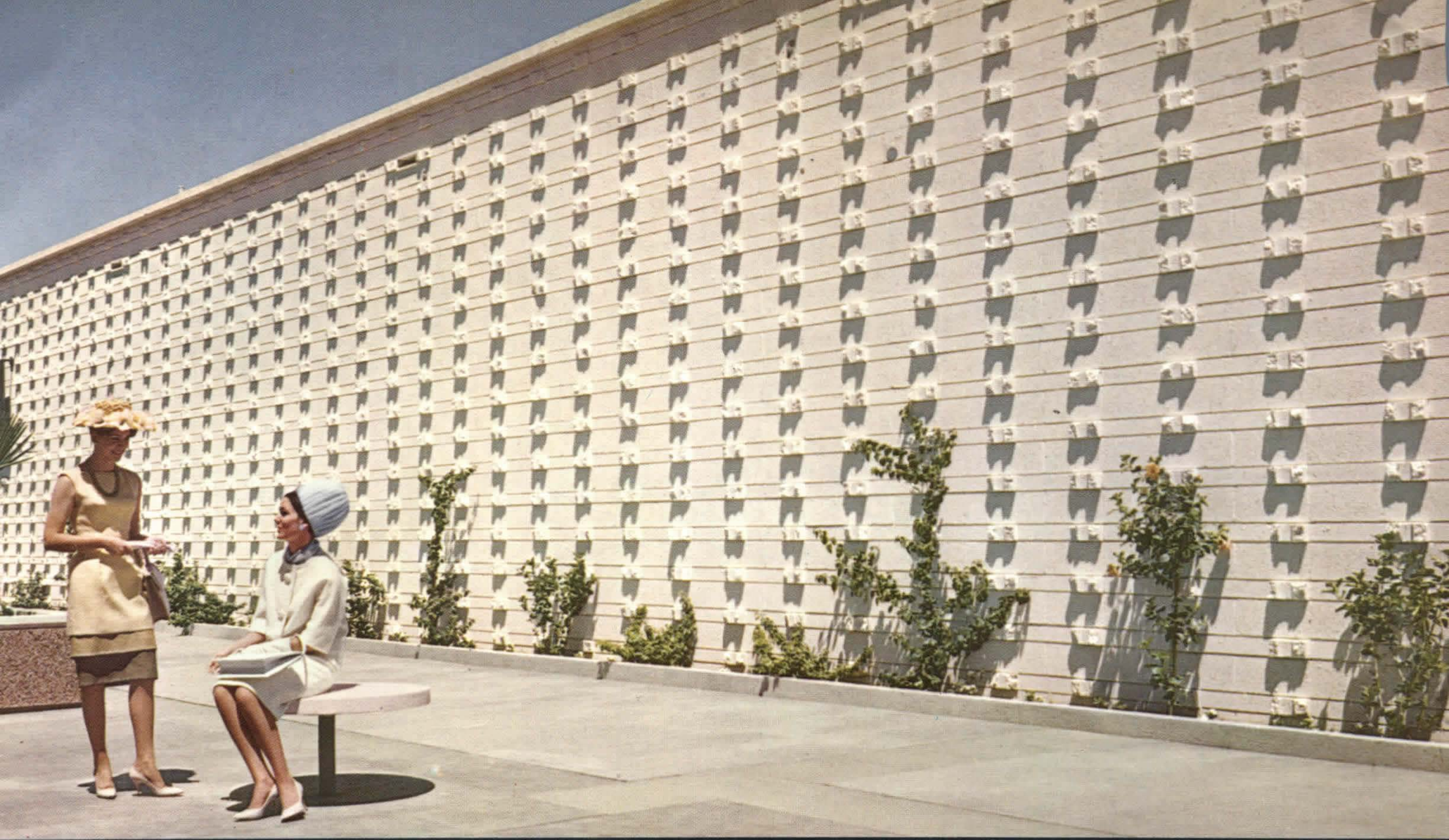
Nothing is more provocative than an intelligent mind marshaling facts toward an undemonstrable conclusion more biased than one's own. New Towns are not *the* answer to Megalopolis, but Frederic J. Osborn, in the first half of this important book, makes a persuasive case for his own experience.

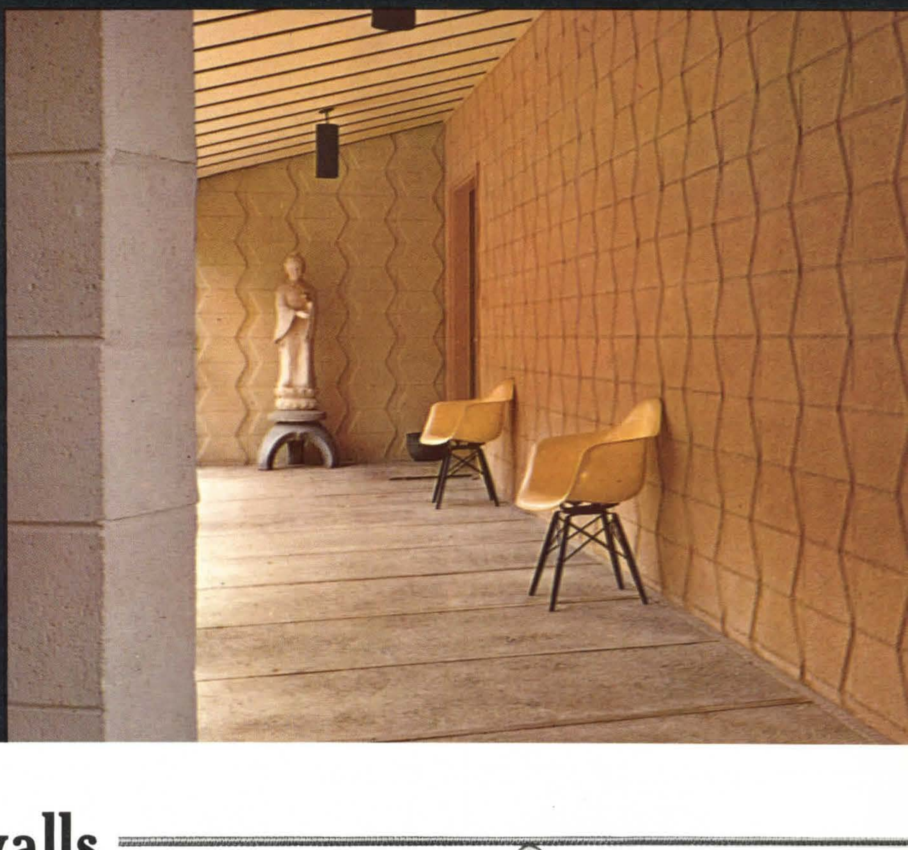
Well-honored for his contributions to planning philosophy and practice, including two decades of service as Estate Manager of Welwyn Garden City, Osborn splendidly answers the criticisms leveled against the English New Town movement and returns a few brickbats of his own.

Not as well documented as academic treatises covering the same period, Osborn's memoirs nonetheless include the important materials from Aristotle to Abercrombie. The proponent's case for New Towns is succinctly stated: secular urban evils overcome, easy communication, reduction in the journey to work, a less septic environment for family life, the consciousness of belonging to a community of comprehensible size, the economies of deliberate development as opposed to laissez-faire sprawl.

However, prejudices as amusing as they are apparent color the text. One sample:

*Continued on page 308*





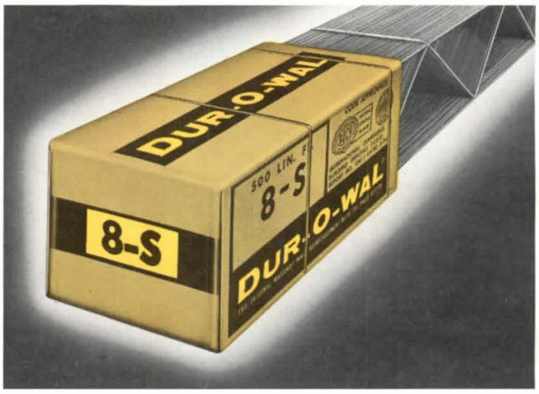
Build better masonry walls

with Dur-O-waL

and Dur-O-waL Products...

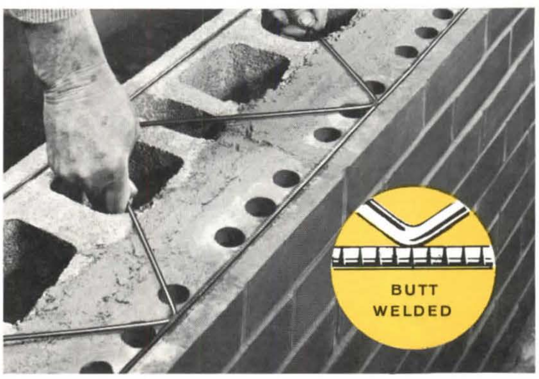
# What is Dur-O-waL?

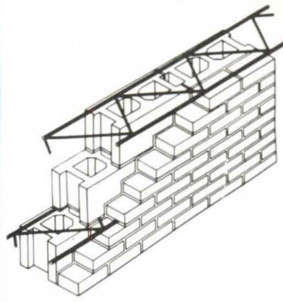
Dur-O-waL brand is the original masonry wall reinforcement with the truss design. Specially designed to give greater strength and bond to masonry walls, Dur-O-waL also minimizes shrinkage, temperature and settlement cracking in masonry. Dur-O-waL is manufactured from high-tensile steel, deformed and electrically butt-welded to give you the highest quality masonry wall reinforcement material known to construction today. Insist on Dur-O-waL.



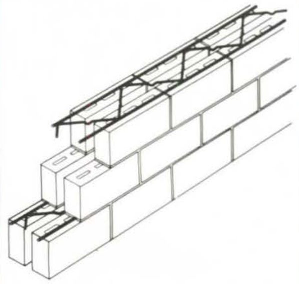

# How does Dur-O-waL work?

Like nothing else on the market. This truss design reinforcement increases flexural strength of your masonry walls 79 to 261 per cent, depending on the weight of Dur-O-waL used, type of mortar and number of courses. And note how the side rods are scientifically deformed on four sides for the best possible gripping contact with mortar. Choose from a complete range of Dur-O-waL brand shapes and sizes.

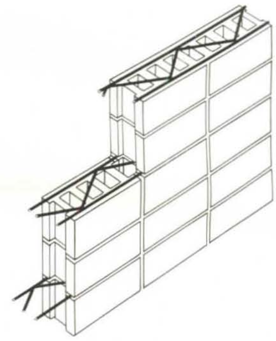


COMPOSITE WALLS



CAVITY WALLS



PLAIN WALLS

## Use Dur-O-waL to reinforce plain, composite and cavity walls

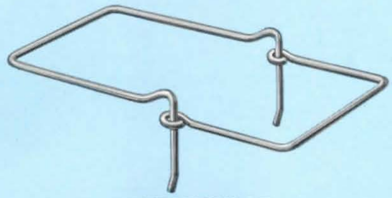
Dur-O-waL gives your masonry walls increased compressive strength, increased transverse strength and marked improvement in resistance to moisture penetration in composite walls.

**DUR-O-WAL®**

**THE ORIGINAL MASONRY WALL REINFORCEMENT WITH THE TRUSS DESIGN**

# Are you familiar with these other versatile products made by Dur-O-waL?

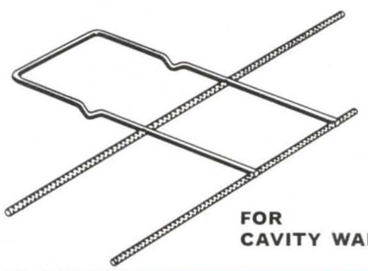
## Adjustable Wall Ties



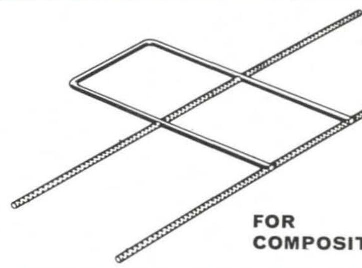
RECTANGULAR

Z-TYPE

## Continuous Rectangular Ties (Tab-Tie)

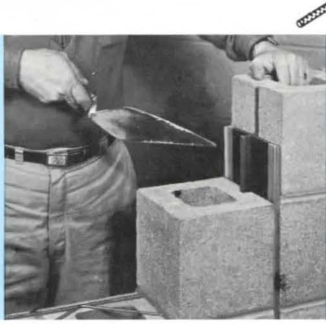


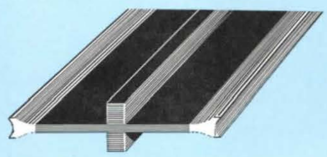
FOR CAVITY WALLS



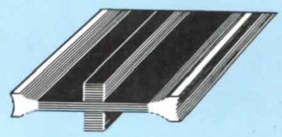
FOR COMPOSITE WALLS

## Rapid Control Joint

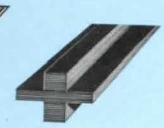




NO. 8 WIDE FLANGE

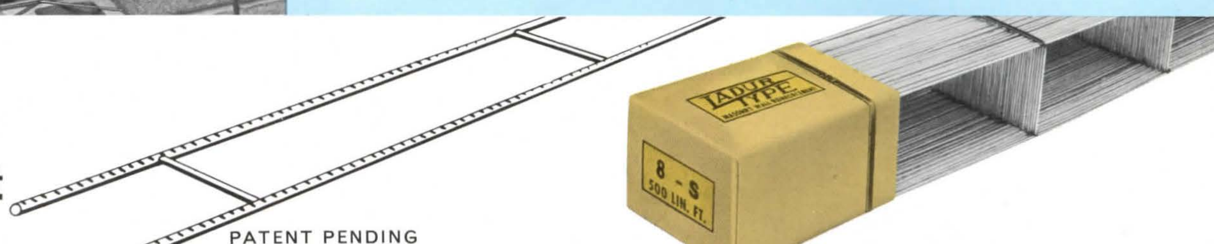


NO. 6 WIDE FLANGE



REGULAR

## Ladur Type® Reinforcement




PATENT PENDING

**Clip this coupon and mail to Dur-O-waL National Inc., Post Office Box 150, Cedar Rapids, Iowa, for complete information on Dur-O-waL brand masonry wall reinforcement and other Dur-O-waL products.**

Please send me information on the following:

- ☐ Dur-O-waL Truss Design Masonry Wall Reinforcement
- ☐ Ladur Type Reinforcement
- ☐ Adjustable Wall Ties
- ☐ Continuous Rectangular Ties (Tab-Tie)
- ☐ Rapid Control Joint
- ☐ Please have a Dur-O-waL representative call.

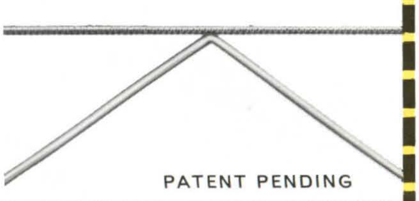
Name______________________________

Firm______________________________

Address____________________________

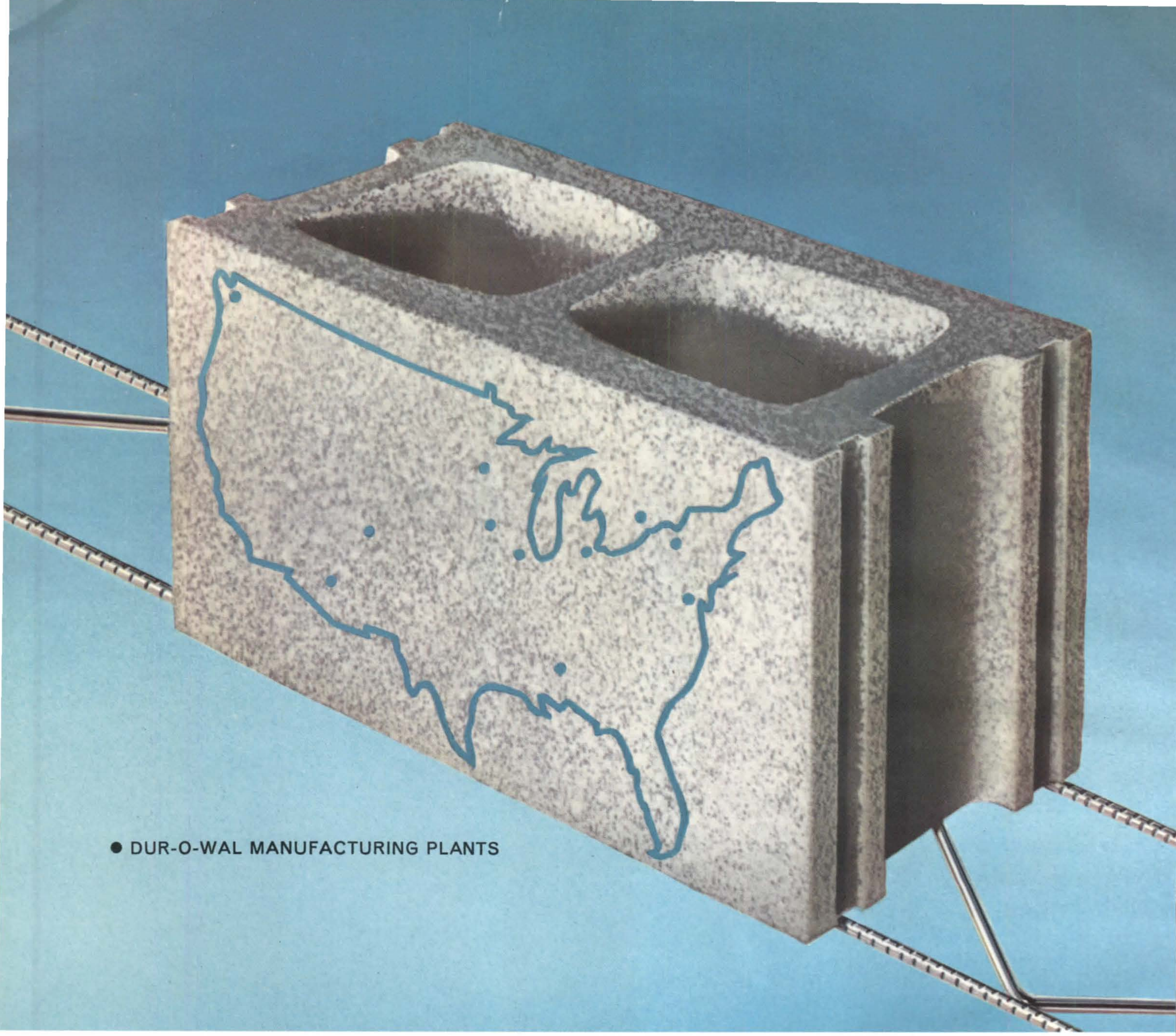
City______________ State________ Zip Code______

Clip and mail to Dur-O-waL



PATENT PENDING

MORE FROM DUR-O-WAL ON THE NEXT PAGE




# You can get Dur-O-waL wherever you get masonry

Not only is Dur-O-waL as versatile as masonry, but it's as accessible as masonry itself. Over 8,000 dealers now recommend and stock Dur-O-waL wherever and whenever you need it. Truss designed Dur-O-waL also carries material approvals for multiple use in masonry wall construction by the following code organizations: Building Officials Conference of America (BOCA), Southern Building Code Congress (SBCC), International Conference of Building Officials (ICBO). When you specify Dur-O-waL, make sure you *get* Dur-O-waL. Look for the original truss design. Look for the Dur-O-waL end wrap. They're your assurance you've found the way to make masonry walls live longer than ever before.

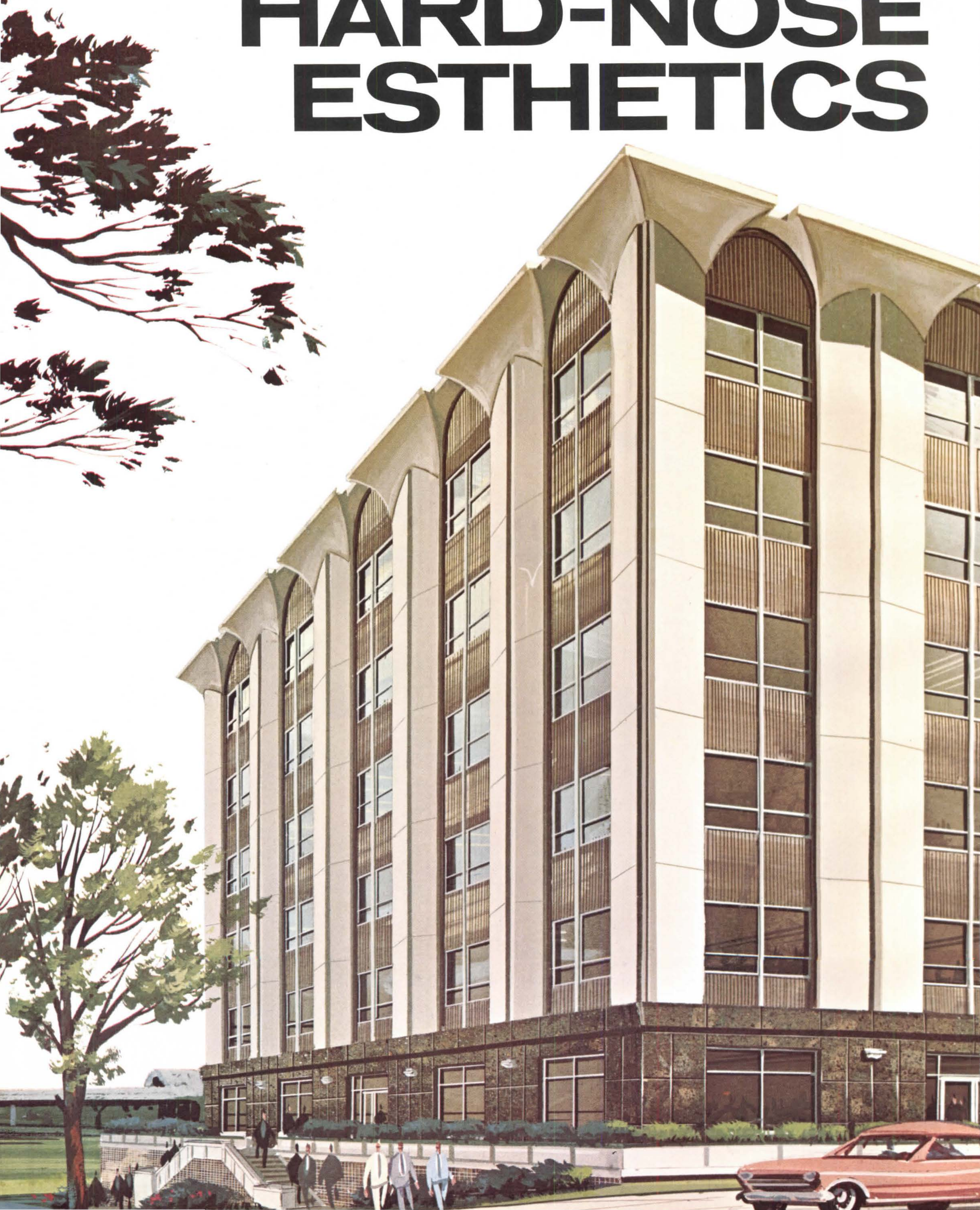

## DUR-O-WAL®

**THE ORIGINAL MASONRY WALL REINFORCEMENT WITH THE TRUSS DESIGN**

**DUR-O-WAL MANUFACTURING PLANTS** • Cedar Rapids, Iowa, P. O. Box 150 • Syracuse, N. Y., P. O. Box 628 • Baltimore, Md., 4500 E. Lombard St. • Birmingham, Ala., P.O. Box 5446 • Aurora, Ill., 625 Crane St. • Pueblo, Colo., 29th and Court St. • Toledo, Ohio, 1678 Norwood Ave. • Mesa, Ariz., 213 So. Alma School Rd. • Seattle, Wash., 3310 Wallingford Ave. • Minneapolis, Minn., 2653 37th Ave. So. • Also manufactured in Canada.

L·O·F introduces a new term in design:

# HARD-NOSE ESTHETICS



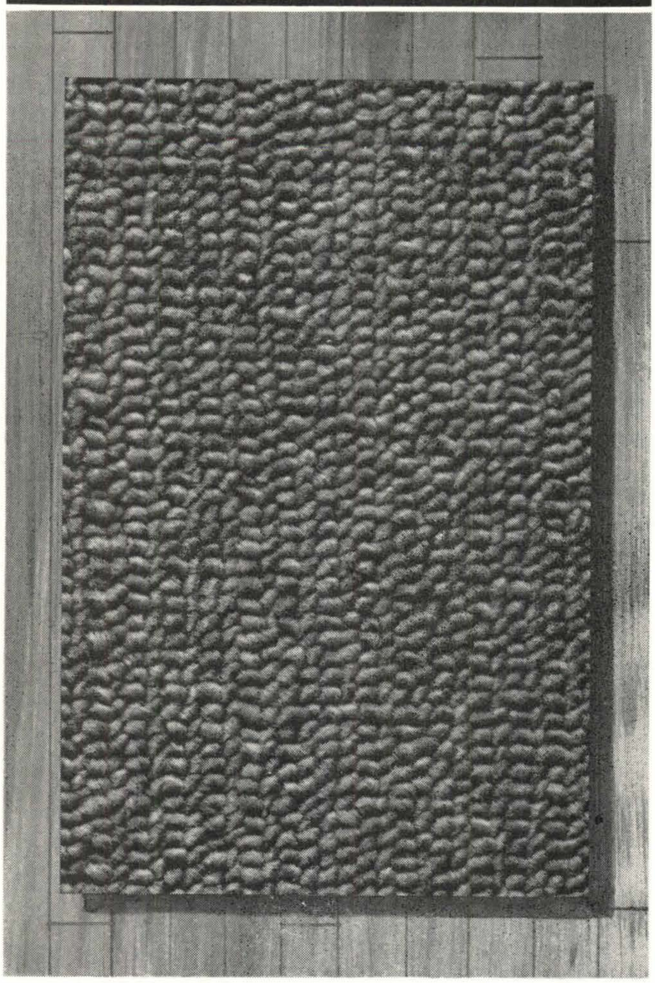
◄ On Readers' Service Card, Circle No. 388

On Readers' Service Card, Circle No. 345 ►

**THE CARPET THAT LIVES UP TO ITS NAME!**

## "COLOSSAL"

**There's nothing you can put on the floor that offers more advantages than this carpet of HERCULON* olefin fiber by DOWNS**



* REGISTERED TRADEMARK OF HERCULES POWDER COMPANY WILMINGTON DELAWARE FOR ITS OLEFIN FIBER.

Take a fiber that keeps colors a lifetime; won't let dust and dirt cling; lets you wipe off spots and spills; is moth and mildew proof; won't fuzz or pill; is anti-allergenic and virtually anti-static. Constructed for high performance and high fashion. Offer it in a 3-color tweed texture loop pile, in 8 tonal ranges; and price it for value. Wouldn't you say it's "fantastic" for public areas? Wouldn't you agree it's "fabulous" for any installation. Yes . . . and furthermore . . . it's "Colossal."

Write for FREE SWATCH of Actual Carpet

## DOWNS

DOWNS CARPET COMPANY, INC., CONTRACT DIVISION
DEPT. P1066, PHILADELPHIA, PENNSYLVANIA, 19134

On Readers' Service Card, Circle No. 475

# clear snowed-in parking lots fast for 80% less

With a Thermal Pit-Type Melter, you simply push snow into a melting pit, and parking problems go down the drain . . . at a savings up to 80%. No trucks, no haulage. No loaders or blowers.

For multiple parking areas, use one Thermal semi-mobile unit to service several melting pits. Fully mobile units also available to take advantage of present snow loading equipment.

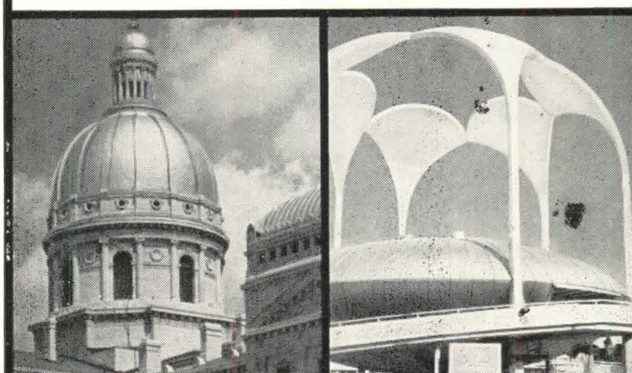
Full details in Thermal Snow Melter catalog.

**THERMAL RESEARCH & ENGINEERING CORP.**
**CONSHOHOCKEN, PA. 19428**
In Canada: TRECAN, LTD., COOKSVILLE, ONT.

On Readers' Service Card, Circle No. 466

# DURAGOLD®

## tarnish resistant golds for exterior finishes



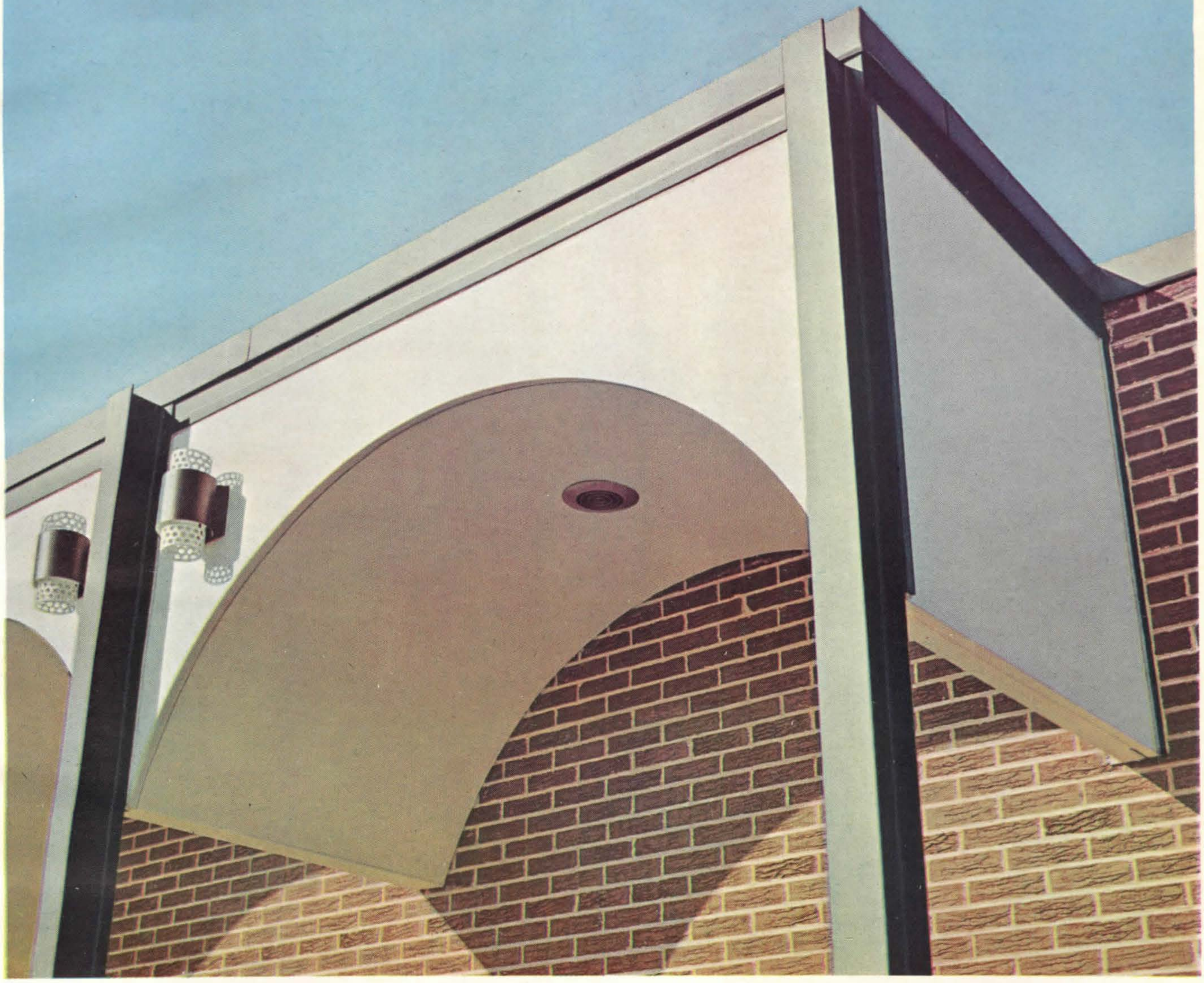
Specify Duragold for bright, economical, durable gold exterior and interior coatings. Shown above, the Indiana State Capitol dome and the Johnson's Wax Golden Rondelle at the New York World's Fair, both covered with coatings containing Duragold pigments. For the names of manufacturers using Duragold, plus a free gold spray can, write or call...

**CLAREMONT Polychemical Corp.**
39 Powerhouse Rd., Roslyn Hgts., L.I., N.Y. 11577 • 516 MA 1-8800

On Readers' Service Card, Circle No. 459

# No ten-million-year-old fault will weaken this "stone" arch.

# It's Johns-Manville Colorlith.®



Panels of Meerschaum White Colorlith form the arches for this modern bank. Colorlith has the same massive beauty as natural stone because it's made the same way. With one difference—Johns-Manville leaves nothing to geological accident.

Inorganic materials—asbestos fibers, cement, chemically resistant pigments—are combined with water under pressure and heat into a monolithic material that has all the strength of quarried rock—but none of the weaknesses. Composition and density are precisely uniform from panel to panel. There are no veins of weakness, no planes of cleavage as in some natural stones.

In addition to white, Colorlith panels are available in a variety of solid colors—and in the swirl patterns of Colorvein®, and the random-particle designs of Colorchip®. Their beauty is constant from any angle because the color goes all the way through.

Western State Bank, Oshkosh, Wisconsin.
Architects: Sandstedt-Knoop-Yarbro, Oshkosh.

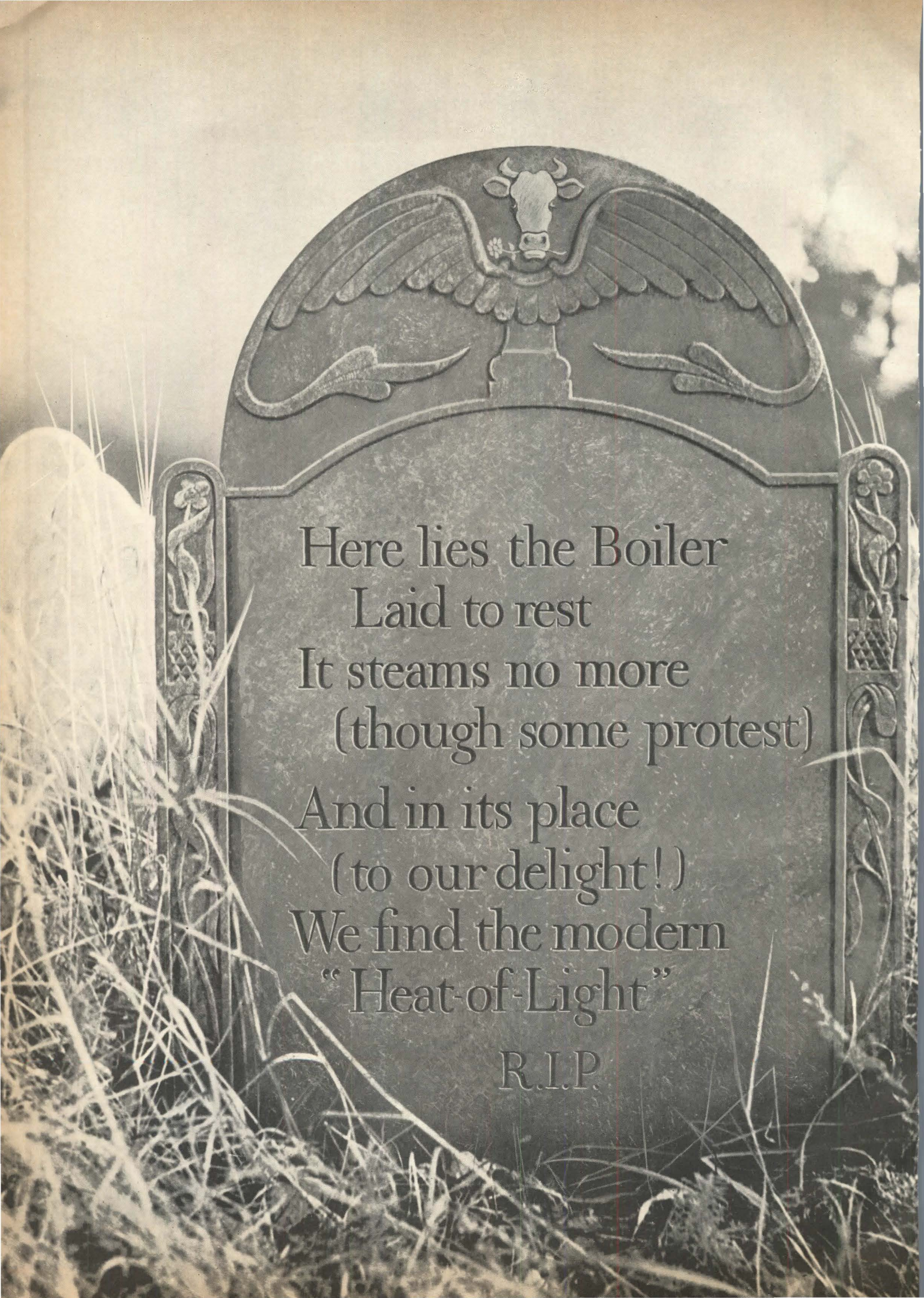
Wherever you need exterior or decorative materials that offer timeless protection and charm—for masonry veneers, steel and wood facings, interior panels or furniture—design with J-M Colorlith, the "stone" that leaves nothing to chance. For your copies of free literature illustrating its many styles and uses, write to Johns-Manville, Box 111, New York, N. Y. 10016. Cable JOHNMANVIL. J-M Colorlith is also available in Canada.

JM

**Johns-Manville**



On Readers' Service Card, Circle No. 379


Here lies the Boiler
Laid to rest
It steams no more
(though some protest)
And in its place
(to our delight!)
We find the modern
"Heat-of-Light"
R.I.P.

## "Every building needs a boiler."

(or some other fuel-burning heat source)

# balderdash!

**New Barber-Colman Heat-of-Light® Systems use heat generated by lights, people, and equipment to heat the building. Result: You can reduce the amount of heating equipment required and lower operating costs. Clip coupon for details.**

"Every building needs a boiler." Balderdash! What's really needed in more of today's commercial buildings is a way to use the heat that's already there (and is now being wasted).

**How to harness light-generated heat**

Today, lighting levels of 100 foot-candles (or more) are common. Light-generated heat often accounts for more than 50% of the total heat gains in the building. This heat has been paid for . . . why not use it?

Heat-of-Light Systems use heat-transfer light fixtures to capture up to 85% of the light-generated heat, keeping it out of the occupied space. Barber-Colman Jetronic mixing units in the ceiling cavity use some of this heat to maintain comfort conditions in interior areas—the rest is available to offset heat losses at the building perimeter, or for storage (to be used later during unoccupied hours). Result: You realize major savings in the cost of air conditioning (often eliminating the need for boilers or other high-output heat sources).

**Simple design offers major savings in system cost**

With a Barber-Colman Heat-of-Light System, hot air ducts, reheat coils, and piping are eliminated. Less pipe and duct insulation are required. And, you get the most possible air conditioning in the least possible space.

What's more, fluorescent lights operate at ideal temperatures (75 to 80°F) increasing light output 12 to 15%. *Lighting levels can be doubled* without increasing conditioned air requirements.

**System offers new design freedom**

With a Heat-of-Light System, you have new freedom to design your structures for maximum esthetic appeal and flexibility—uncluttered ceilings . . . higher lighting levels . . . off-the-wall thermostat locations . . . movable walls wherever needed . . . and zone comfort control for every occupied area, if desired. Instead of imposing design problems, Barber-Colman Heat-of-Light Systems reduce the restrictions on your creativity.

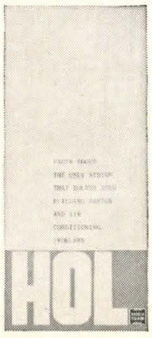
**Electronic computer evaluates Heat-of-Light for your building**

You can evaluate a Heat-of-Light System for your building without leaving your office. All it takes is a one-page Feasibility Study, a short discussion between one of our field people and your design engineer, and a few minutes' work by our computer.

**Get the full story.** Clip the coupon below or contact your nearest Barber-Colman field office. Many of our customers and prospects are finding this Feasibility Study an invaluable service. And, it's free.

BARBER COLMAN

**BARBER-COLMAN COMPANY**
ROCKFORD, ILLINOIS 61101
. . . where originality works for you
In Canada: BARBER-COLMAN OF CANADA, LTD.
Weston, Ontario




☐ Please send me your new booklet on the Barber-Colman Heat-of-Light System.

☐ Please have your local representative call me to discuss a computerized Feasibility Study.

Name____________________

Title____________________

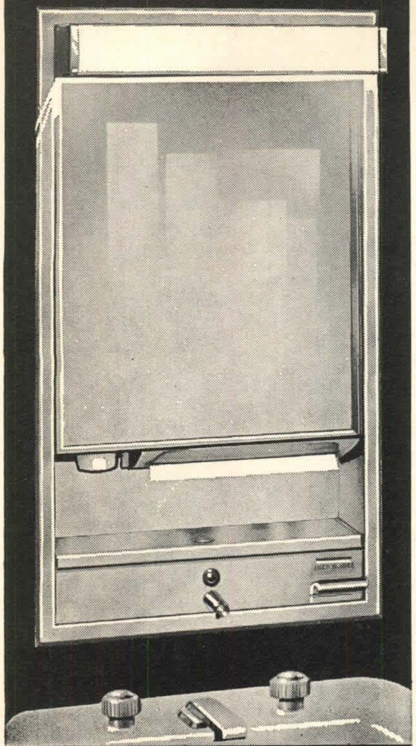
Company____________________

Street____________________

City__________ State________ Zip Code______



On Readers' Service Card, Circle No. 333





*Continued from page 294*

"The New Towns have been obedient to the prevailing architectural fashion. Luckily for the profession, the average Briton, though not highly sensitive to architectural design, does not mind it, so long as the things he really cares about in a house are attended to. He takes great pleasure in gardens, trees, and flowers, with which the New Towns are well endowed."

In the second half of the book, the journalist Arnold Whittick sums up the facts and figures in a chapter about each of the British New Towns. This section is well illustrated and provides a ready reference for those interested in land-use plans, circulation schemes, and densities. The underlying design concepts of each New Town are well described, though some readers will arrive at aesthetic judgements that differs from Whittick's.

The aborted plans for Hook New Town go unmentioned. I find this a serious omission. Without it, the descriptions of the more publicized Cumbernauld are but a half-told tale.

In the largest view of man and society, no one would dispute that Osborn and Company's pamphleteering disguises a consequential contribution to betterment of the urban environment. However dedicated and significant the cause it advances, the book as a whole does not take us out of the 19th Century. For, as Osborn himself soberly notes: "It is only recently that the planned redevelopment and renewal of towns, and the creation of New Towns, have become issues of social or public policy. And we are still far from clarity of thought, true consensus of opinion, or resolute action, on the chronic or emergent problems."

New Towns are a milestone, but they are neither the map nor the journey.

## BOOK NOTES

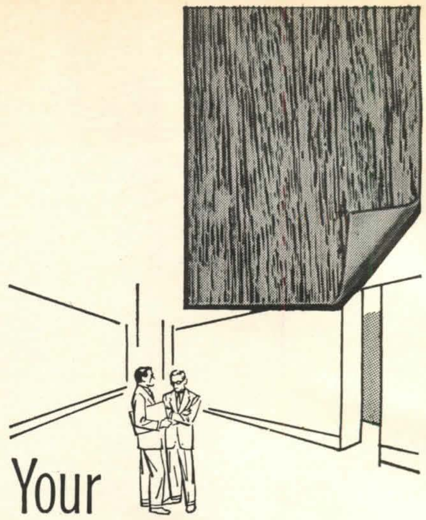
**Contemporary Forming Methods.** By L. Mohácsy. Publishing House of the Hungarian Academy of Sciences, Budapest V. Alkotmány UTCA 21, Hungary, 1966. 320 pp., illus., $12.

*Written in English, this book discusses the building materials and methods for forming both visible and covered concrete surfaces.*

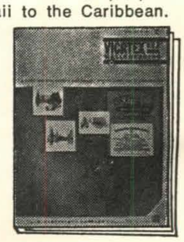
**Freezing and Thawing of Concrete: Mechanisms and Control.** By William A. Cordon. Published by the American Concrete Institute and the Iowa State University Press, P.O. Box 4754, Redford Station, Detroit, Mich., 1966. 100 pp., $4.50.

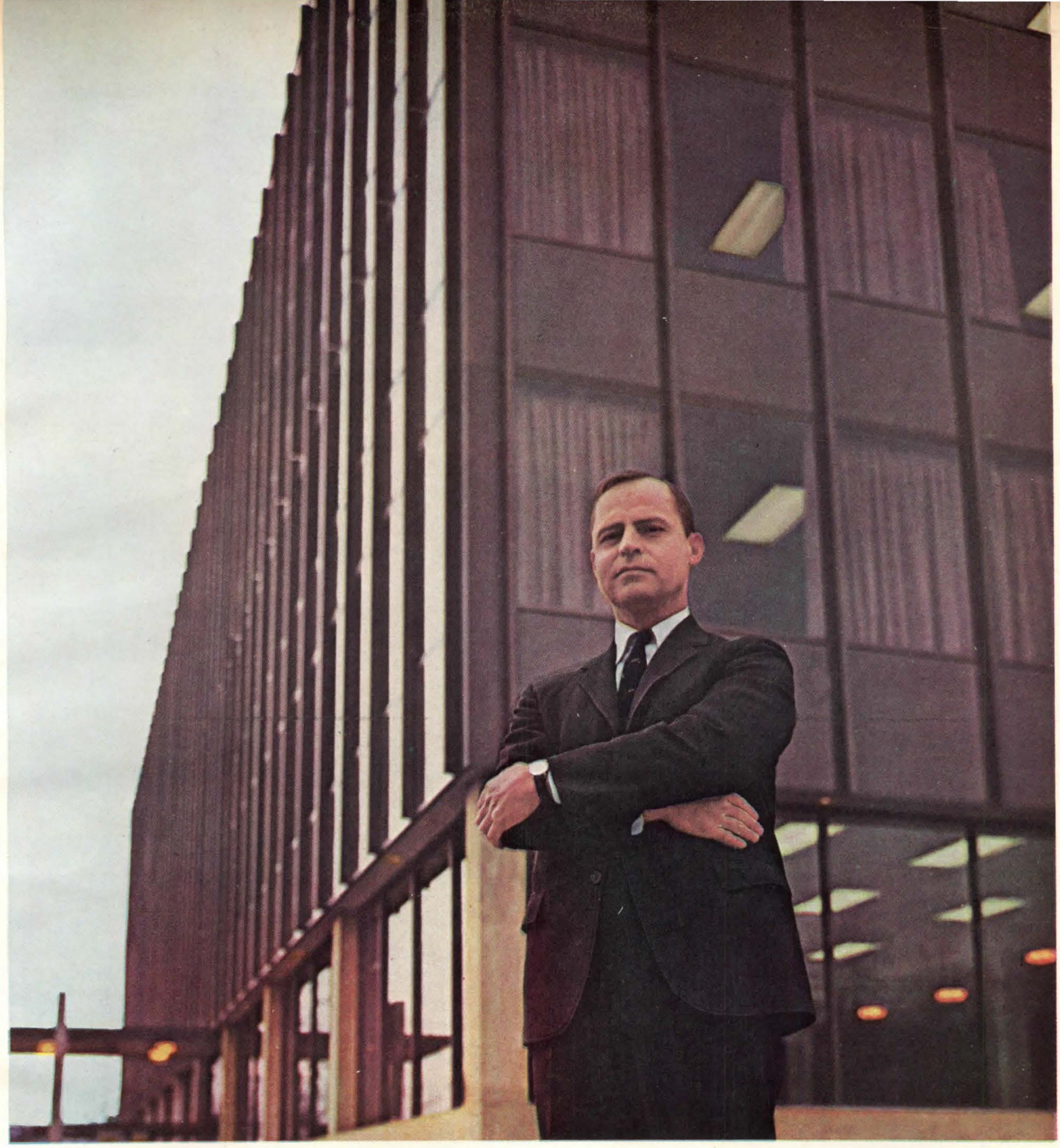
**Modern School Shop Planning.** Fourth Revised and Enlarged Edition. Prakken Publications, Inc., 416 Longshore Drive, Ann Arbor, Mich., 1965. 257 pp., $4.50.

*Continued on page 311*









Five-story Chesapeake Building provides nearly 90,000 sq ft of office space for the fast-growing community of Towson, Md. Bronze-colored steel wall panels and exposed mullions blend beautifully with heat-resistant glass windows.

# "Complete flexibility in arranging office spaces . . . steel framing proved most economical"

**C. W. Jackson, President, C. W. Jackson & Associates, Inc., Owner-builder, The Chesapeake Building, Towson, Md.**

"The Chesapeake Building is not only the largest office building in Towson, but surely the most flexible. The key to its flexibility is the use of steel in its construction.

"By framing the building with high-strength structural steel, our engineers were able to create the long, clear spans needed for flexibility . . . yet the floor framing members were kept shallow. This, in turn, held down the overall height of the building and resulted in significant savings.

"By using cellular steel decking for the floor system, we're able to locate electrical and telephone outlets to fit the ever-changing needs of our tenants. We just penetrate the floor covering and run wiring through the decking to a floor receptacle.

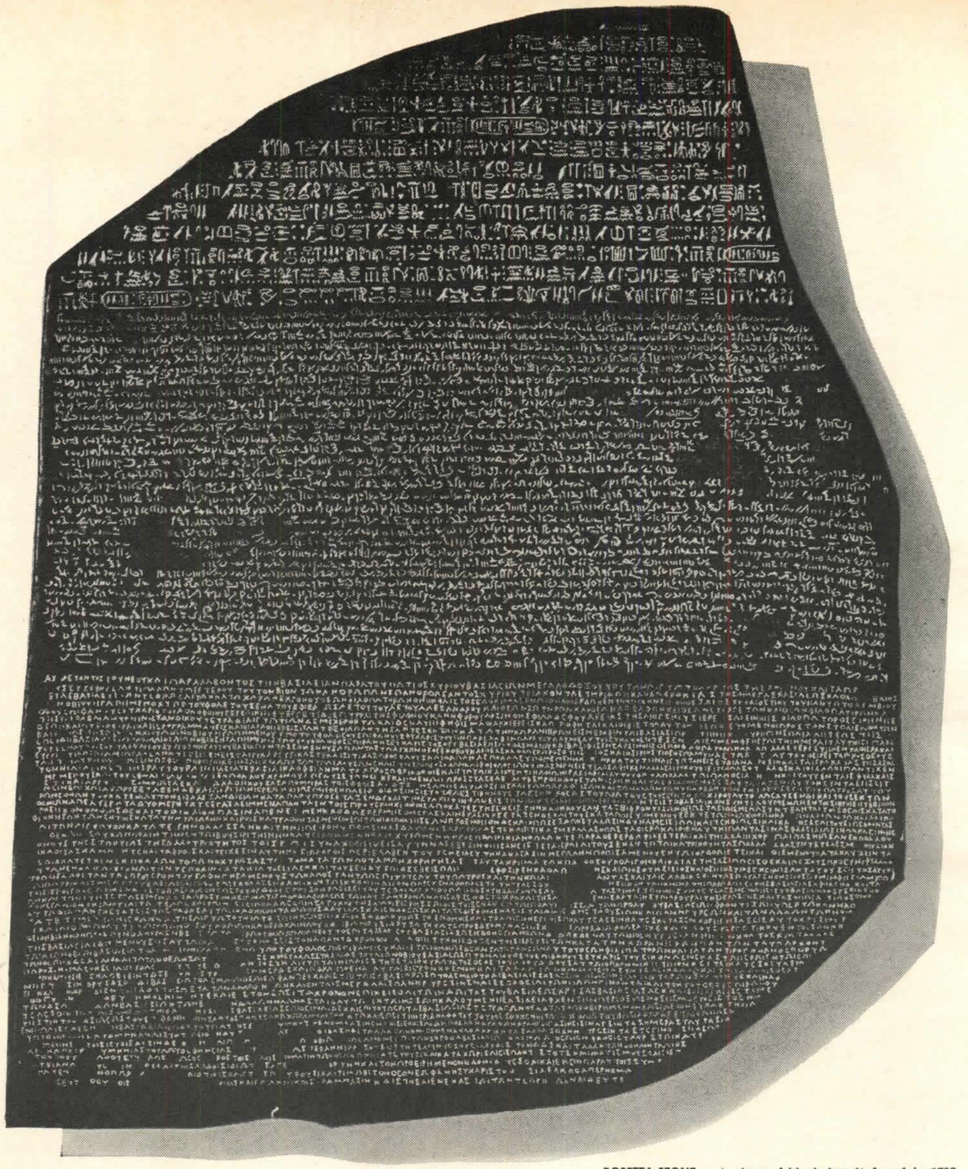
"Lightweight steel interior partitions also add to the building's flexibility. They're easy to move, and they're attractive and soundproof."

*Architect:* Smeallie, Orrick and Janka. *Structural Engineer:* Lamprecht Consultants. *Steelwork:* Dietrich Bros., Inc. All are Baltimore firms.

**BETHLEHEM STEEL**

*Bethlehem Steel Corporation, Bethlehem, Pa.*

BETHLEHEM STEEL



**ROSETTA STONE** — A piece of black basalt found in 1799 near the Rosetta mouth of the Nile, bearing a bilingual description in hieroglyphics and Greek. This gave the first clue toward deciphering Egyptian hieroglyphics.
Photograph courtesy of Field Museum of Natural History

# WE HELP KEEP IT SIMPLE!

Hieroglyphics belong in a museum, not in specifications for a temperature control system. We feel a 'spec' should be written simply and clearly to permit true competitive bidding. When Powers helps with a specification, the system is described in straightforward terms, without restrictive references to catalog numbers or obscure product features.

OUR 75th YEAR

Manufacturers of temperature control, water mixing, industrial process, and pneumatic despatch systems.

**THE POWERS REGULATOR COMPANY**

Dept. 1066, Skokie 28 Illinois / Offices in Principal Cities in U.S.A. and Canada

16-110

*Continued from page 308*

**National Fire Codes: 1965-66.** Ten Volumes. National Fire Protection Association, 60 Batterymarch St., Boston, Mass., 1965. \$30 for the set; \$4 per volume.

**The Penguin Encyclopedia.** Edited by Sir John Summerscale. Penguin Books, 39 West 55 St., New York, N.Y., 1966. 552 pp., illus., \$1.95 (paperbound).

*A useful desk reference work with short but well-written and up-to-date information on all subjects.*

**Plain and Reinforced Concrete Arches, Bibliography No. 6.** American Concrete Institute, P.O. Box 4754, Redford Station, Detroit, Mich., 1966. 34 pp., \$4 (ACI members, \$2).

**Planning, Zoning, Subdivision: A Summary of Statutory Law in the Fifty States.** By Robert M. Anderson. The New York State Federation of Official Planning Organizations, 112 State St., Albany, N.Y., \$6.50.

**Regional Development Policy: A Case Study of Venezuela.** By John Friedmann. The MIT Press, Cambridge, Mass. 02142. 1966. 279 pp., illus., \$8.50.

*John Friedmann, who is Director of the Ford Foundation Program in Urban and Regional Development in Chile, discusses Venezuela in general and Ciudad Guayana in particular.*

**Significance of Tests and Properties of Concrete and Concrete-Making Materials —STP 169A.** American Society for Testing and Materials, 1916 Race St., Philadelphia, Pa., 19103, 1966. 580 pp., \$12 (ASTM members, \$8.40).

**Tenant Action.** By The Architects' Renewal Committee in Harlem (ARCH), 306 Lenox Ave., New York, N.Y., 1966. 66 pp., \$1.25.

*A handbook intended for tenants, and organizations of tenants, in older and poorly maintained buildings where housing problems are a daily occurrence and conditions are often a serious threat to life and health. The handbook details tenants' rights and means of acting on them.*

**Theory and Practice of Reinforced Concrete.** Fourth Edition. Clarence W. Dunham. McGraw-Hill Book Co., 330 W. 42 St., New York, N.Y., 1966. 629 pp., \$13.90.

**Trane Air Conditioning Manual.** Trane Company, La Crosse, Wis., 1906. 456 pp., \$8.

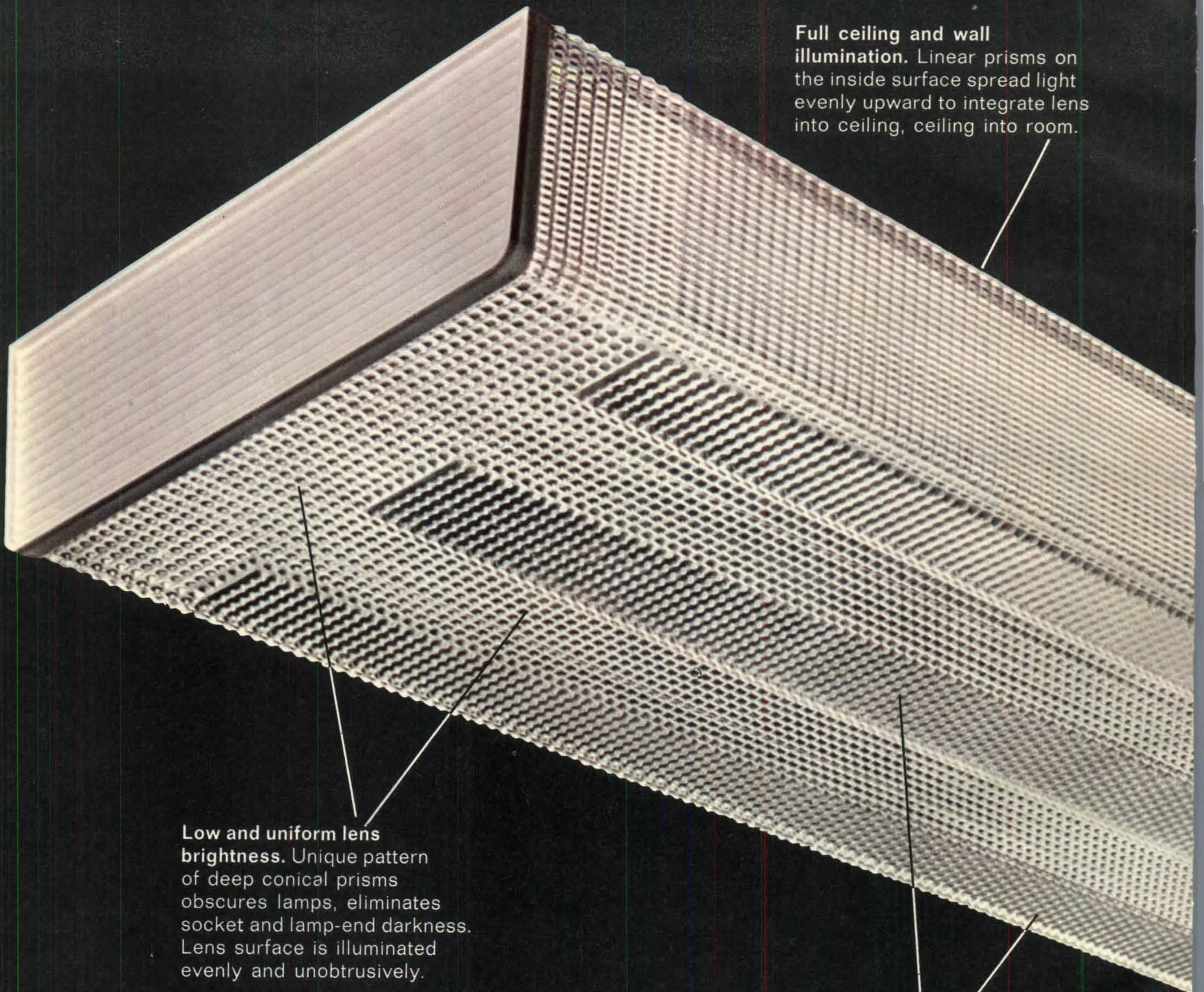
*A completely updated and expanded edition of the Manual, which, reportedly, is "straightforward and noncommercial."*

**The Urban Evolution Theory.** By Eric E. Embacher. Copi-Rite Reproductions Co. Ltd., 111 Vulcan St., Rexdale, Ontario, Canada, 1966. Illus., \$3.50.

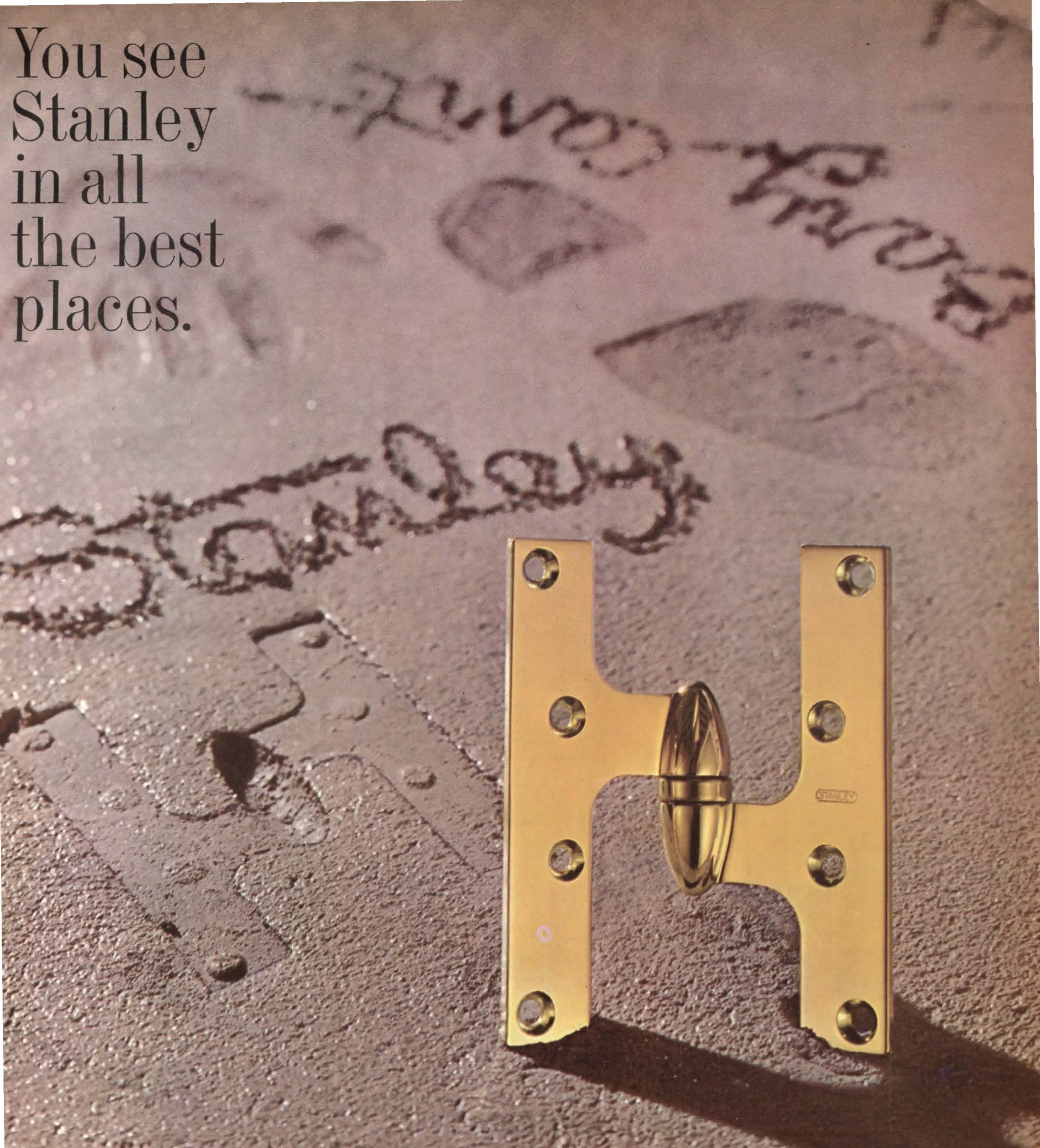
*A discussion of ways of planning the growth and change of cities without submitting them to repetitive obsolesence and continuous adaptation. Embacher's method is "space-time planning," which permits urban growth without waste. The "Urban Evolution Theory" tries to relate the urban phase of global evolution to the preceding biological phase, using the "urban cell" as a unit, together with groups of urban cells and systems for grouping them, to formulate a philosophical basis for a space-time planning concept for growing but changing urban environments.*

*Continued on page 320*

# Here's a slim ceiling-mounted
# solve architectural lighting problems



◀ On Readers' Service Card, Circle No. 373




Places like the Michigan Consolidated Gas Building in Detroit, the Marshfield (Wisconsin) Hospital, and Philharmonic Hall in New York City. Places noted. Places commented upon. Places where only the most modern hinges are appropriate. With their inherent elegance and sound engineering, is it any wonder Stanley hinges were the ones chosen? Stanley Hardware, Division of The Stanley Works, New Britain, Connecticut.

STANLEY

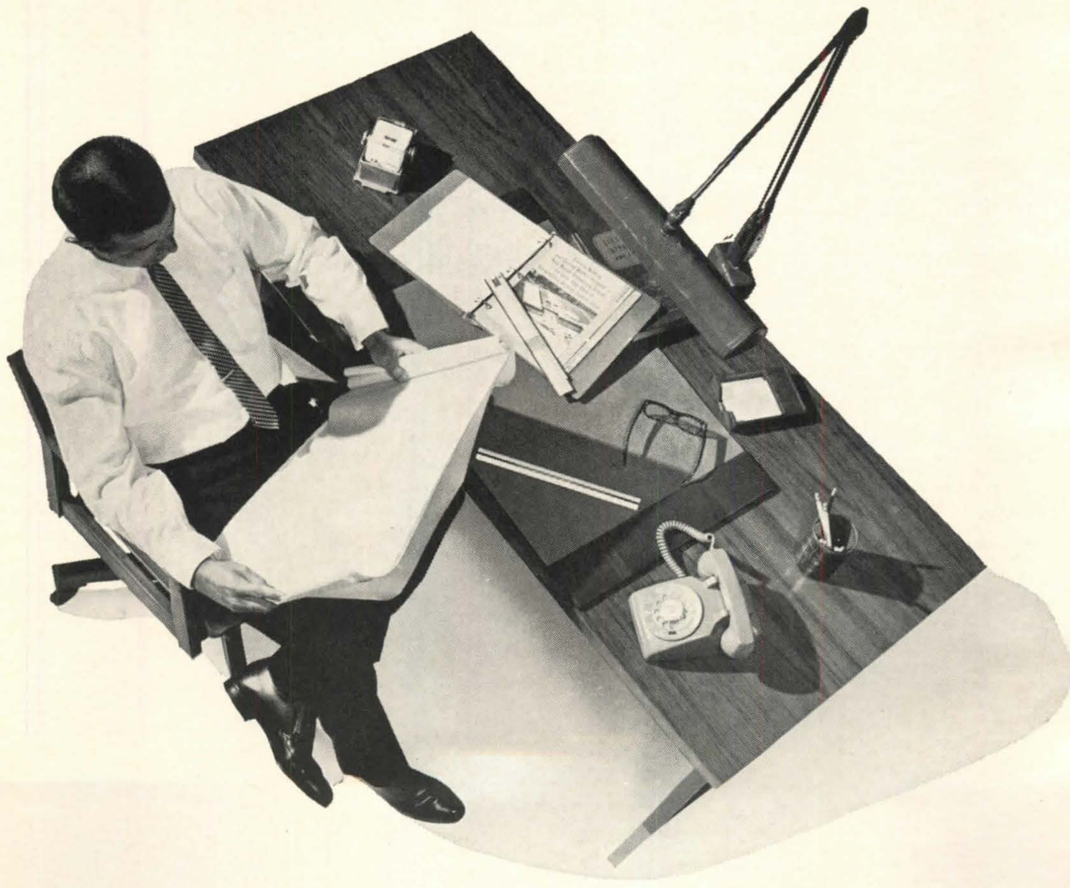
On Readers' Service Card, Circle No. 437

# You've made the move to electric heat. Good choice.

# Now, who installs it?

Electric heat is an electrical function and should be the responsibility of a qualified electrical contractor. That way, you've got the one man who can furnish, install, connect and inspect electric heating equipment—the one man who can see the job all the way through from plans to permit to operating guarantee.

How can you be sure a qualified electrical contractor will furnish and install your next electric heating system? That's easy. Put the heating specs into the electrical section of your building plan.



## Your Qualified Electrical Contractor

**NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION, 610 Ring Building, Washington, D.C. 20036**


# ...and you have a choice of 30 attractive colors with Inland Wall Systems


1. Panel is prepared with Inland's exclusive Ti-Co continuous galvanizing.
2. Chromate coating provides a bond between galvanizing and paint.
3. Epoxy resin prime coat serves as flexible base coat for final finish, and prevents flaking.
4. Panel is finished with alkyd melamine paint chosen for hardness and weather resistance.

Inland Steel Wall Systems save on maintenance costs, even after years out of doors. A rigorous exposure test in salt-air climate has proved the weatherability, color fastness and chalk resistance of Inland's two-coat, oven-cured Duofinish.

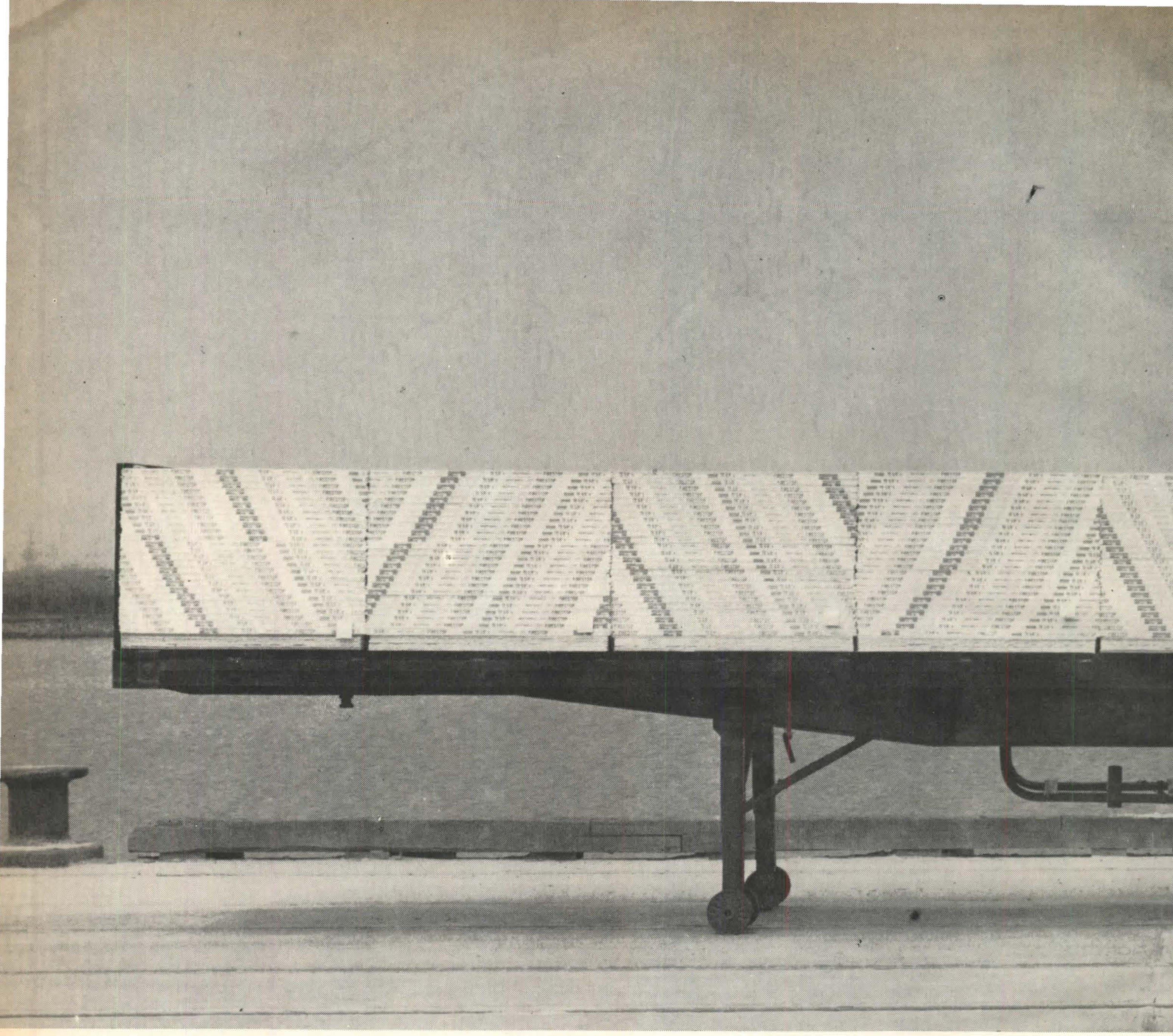
Duofinish gives the designer a palette of 30 weather-tested colors.

Inland Wall Systems are available in 5 different panel profiles, each with its own distinctive configuration and shadow line. Panels may be used insulated, uninsulated, and as fire walls.

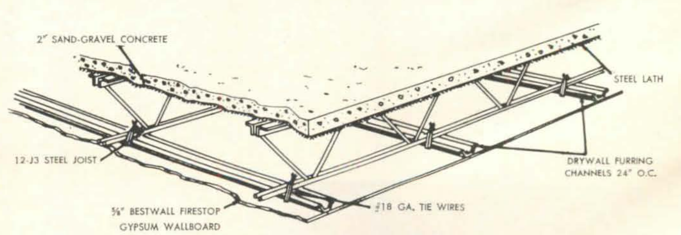
For complete information, see Sweet's section 3b/Inl. Or write today for catalog 243 to Inland Steel Products Company, 4069 West Burnham Street, Milwaukee, Wisconsin 53201.

**Inland Steel Products** INLAND®

On Readers' Service Card, Circle No. 375



# New 5/8″ Firestop provides




**UL Design 259—2 Hr. (with 2″ concrete)**

*Continued from page 311*

**A Walk in Georgetown.** Text and photographs by Mary Mitchell. Barre Publishing Co., Couth Street, Barre, Mass. 96 pp., illus.

*A good and informative and handsome book on Georgetown and its buildings, mainly houses. Many histories of individual structures. Where the book falls down is in its failure to take a hard look at Georgetown today, i.e., the tiresome historicity of the hulking Georgetown Inn, the anonymous but sort of jolly buildings such as the Lehi Grill, the sad passing of the old powerhouse. A satisfactory guidebook to "important buildings," however.*

**Welding Aluminum.** The American Welding Society, publisher. Copies available from The Aluminum Assoc., 420 Lexington Ave., New York, N.Y. 134 pp., $2.50.

**Willy Stäubli: Brasilia.** Universe Books, Inc., 381 Park Ave. South, New York, N.Y., 1966. 197 pp., illus., $15.00.

*A thorough description in text and photographs of the architecture of the new city and University—not the social or economic aspects—with reports by Costa and Niemeyer.*

**With Heritage So Rich.** A Report of a Special Committee on Historic Preservation, Under the auspices of the U.S. Conference of Mayors. Random House, 457 Madison Ave., New York, N.Y., 1966. 230 pp., illus., $10.

*A book written by several people, including three architects, who believe that "Land without population is a wilderness, and population without land is a mob." A rational plea for preservation of the nation's remaining natural and architectural heritage.*

**The Work of Frank Lloyd Wright. The Great Wendingen Edition.** Introduction by Mrs. Frank Lloyd Wright; contributions by Frank Lloyd Wright and other architects and writers. Horizon Press, 156 Fifth Ave., New York, N.Y., 1965. 164 pp., illus., $42.50.

*This edition retains the double-fold pages, and the printing and binding of the original. Some photographs, which show better views of buildings than in the original, were added, together with all the dates and locales for each of the buildings.*

**The World Cities.** By Peter Hall. McGraw-Hill Book Co., 330 West 42 St., New York, N.Y., 1966. 256 pp., maps, illus., $2.45 (paperbound).

*In 1915, Patrick Geddes christened as "the world cities" London, Paris, Randstad Holland, Rhine-Ruhr, Moscow, New York, and Tokyo, because a disproportionate share of the world's business was being transacted in them. This book describes each one in statistical, geographic, economic, and urban planning terms.*

**The World of Contemporary Drama.** By John Gassner. The American Library Assoc., 50 E. Huron St., Chicago, Ill., 1966. (pamphlet) 60¢.

*Recommended for any architect who wants a quick review of modern theater history. Excellent for anyone designing a theater.*

## NOTICES

### *New Firms*

ROY W. BANWELL, JR., Architect, Musgrove Building, Hanover, N.H.

*Continued on page 324*


# VALUE SYSTEM-800

## highest quality lighting at lowest costs per room

Here is an inspired new product concept from Miller — a suspended luminaire room system that provides its owner with *illumination of highest quality at lowest costs.* A true VALUE, System-800 assures you of unsurpassed seeing comfort and economy, regardless of room lighting level desired. Balanced lighted appearance, and clean shallow lines complement functional performance.

The unique light distribution and high utilization of lamp output resulting from System-800 fixture design, make this system particularly suitable for school, office, and public areas.

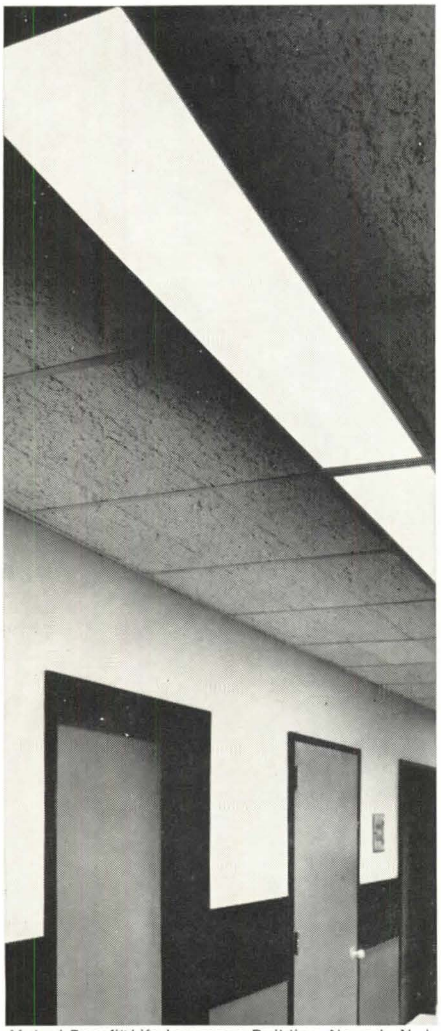
The cost savings you can realize are exciting. Initial equipment, installation, owning and operating costs are *all* lower than for other systems with which System-800 may be compared on a per room basis. For instance, you can now save up to 24% on initial equipment cost alone!

For complete, factual information on the performance, economic advantages, and convenience of installation and maintenance of VALUE SYSTEM-800 — send for our illustrated 4-color brochure today.

THE miller COMPANY • MERIDEN, CONN. • UTICA, OHIO • MARTIN, TENN.

miller
LIGHTING
SINCE 1844

# Why do processors of LUCITE® acrylic plastic bother with 20 different compositions and at least 3 different processing techniques?



Mutual Benefit Life Insurance Building, Newark, N. J.

Better Light Better Sight Bureau approved study lamp.

Century City street lighting, Los Angeles, California.

# They're thinking about your next lighting installation.

Your lighting installation might involve anything from a 24-inch-diameter street-lighting globe containing a 400 watt mercury lamp . . . to an 8-foot-long diffuser for fluorescent tubes . . . to a small luminaire designed for accurate photometry, with a lens precisely shaped for optimum light distribution.

To meet such widely divergent needs, Du Pont makes available to processors a variety of formulations of LUCITE, specially adapted to different end uses. Equally important are the different processing methods. Optical, functional or aesthetic designs that can be produced only with difficulty or expense by one method may be easily produced by another.

For example . . . for sheets of relatively large area, where a thickness of one-eighth inch or more is required, sheeting *cast* from LUCITE acrylic monomer is generally used.

The *extrusion* process makes possible special cross sections and flat sheets in almost unlimited lengths, which can be embossed for refractive light control or pigmented for diffusion. Matte finishes can be provided (LUCITE 148).

For intricately shaped luminares or for lenses that are ribbed for mechanical strength, *injection molding* is ideal. This process also lends itself to the manufacture of lenses with extremely accurate contours.

And the processors of Du Pont LUCITE are rapidly developing skills in blow molding and other processing techniques, to further extend your design capability.

To find out more about the forms and formulations of LUCITE available to you, write for "LUCITE for Lighting". Address: Du Pont Co., Room 4214, Wilmington, Del., 19898.

LUCITE® DU PONT

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY



On Readers' Service Card, Circle No. 476



On Readers' Service Card, Circle No. 454 ➤

# AVANT GUARD.

What's avant these days? Lever handles. Especially if they have a pure look. Sleek, sophisticated, straight. But Yale makes sure they do something else besides look good. Guard.

**YALE®** LOOKS AS GOOD AS IT LOCKS

THE FINEST NAME IN LOCKS AND HARDWARE


Jefferson lever handle shown with Yale Mono-Lock.

EATON YALE & TOWNE INC.

*Continued from page 320*

BETTS & MCCULLOH, Architects, 41 East 57th Street, New York, N.Y., 10022.

VAUDLINE A. CURTIS & ASSOCIATES, Architects, 3700 Upton Avenue, Toledo, Ohio.

DONOVAN ASSOCIATES, Consulting Engineers, 740 North Main St., West Hartford, Conn.

GALE A. HILL & ASSOC., 11722 Studt Avenue, St. Louis, Mo. 63141.

KENNARD and SILVERS, Architects/Planners, 5605 West Washington Boulevard, Los Angeles, Calif.

NEVED & KIMBALL, Architectural and Hospital Consultants, 360 N. Michigan Avenue, Chicago, 911.

EDMOND T. PARKIN. Architect/Landscape Architect, 20 Eglinton Avenue East, Toronto, Ont.

JERRY EDWARD RYAN, Architect, 205 West Harrison Avenue, New Orleans, La.

URBAN DESIGN ASSOCIATES, Architects-Planners, 3508 Fifth Avenue, Pittsburgh, Pa.

WACHSMUTH & ASSOCIATES, INC., Interior Designers, 311 Alexander St., Rochester, N. Y.

### *Elections, Appointments*

AMERICAN INSTITUTE OF STEEL CONSTRUCTION, New York, N.Y., has elected J. PHILIP MURPHY as president of the institute.

CAUDILL, ROWLETT & SCOTT, Architects, Houston/New York, have appointed JAMES FALICK associate in charge of health facilities division.

COMMONWEALTH ASSOCIATES, Inc., Engineers, Consultants, Architects, Jackson, Mich., have appointed EDWIN C. YAW director of their plant engineering division and EARL WEATHERLY director of the business development division.

CORCO, Inc., a firm specializing in interior planning and complete furnishing of institutions, Chicago, Ill., has elected JACK P. SOLOVY president.

DESIGNS FOR BUSINESS, Inc., New York, N.Y., has appointed three vice-presidents: ALEX J. ILLICH, VIDVAR I. HERMANOVSKI, GERALD WHITFORD.

I.S.D., INC., Chicago and New York, Interior Space Designers, have named (MRS.) LESLIE KICHIN and JOHN A. DZIUBA senior project managers of their Chicago office.

JACOBS ENGINEERING CO., Pasadena, Calif., has appointed three new staff members: RICHARD L. BONE, process engineer; ARIES GRAMMATIKAS, structural engineer, and ALLEN J. SAVAGE, project engineer.

A. EPSTEIN & SONS, INC., Engineers and Architects, Chicago, Ill., have named S. ERNEST PEPE senior vice-president and MARVIN L. MASS and JOSEPH A. VEDRA

*Continued on page 334*


*Crucible Steel Company, Hunter Research Laboratory, Pittsburgh, Pa. Engineers and Designers: Hunting, Larsen and Dunnels, Pittsburgh, Pa. General Contractor: Landau Brothers Building Co., Pittsburgh, Pa.*

# These Smith Walls are a stainless steel showcase

They make a beautiful building! But, better than that, they are an outstanding product display of Crucible Steel Company's own stainless steel. The Shadowall fluting of the panels demonstrates the formability of the material. And, years from now, the gleaming finish of the metal will reflect its maintenance-free durability.

What you can't see when you look at this typical Smith installation is the single responsibility that made it possible . . . and typical. The walls were designed, custom-fabricated, delivered and erected by Smith personnel . . . to the architect's specifications . . . to the customer's satisfaction. With the complete responsibility on our shoulders, we make sure the job is right . . . and completed on schedule.

Would additional views of this interesting installation be helpful to you? We've made a limited number of color photos available for the asking.

Specify Smith Walls . . . the single responsibility . . . for your next project. You'll find details in Sweets' Catalog File 3b/Sm and 8b/Sm. Or write.

**ELWIN G. SMITH & COMPANY, INC.** **Pittsburgh, Pa. 15202/Atlanta • Boston Chicago • Cleveland • Cincinnati • Detroit • Philadelphia • Toledo • New York**

SMITH

*A LATCO EXCLUSIVE*

# *shades of old Venice*

**VENEZICO®**

*VENETIAN-CUT MOSAIC TILE*

*Lavish shades, subtly fusing the glory of Renaissance Venice and the aura of Asian opulence, have inspired Latco's "Venezico" collection.*

*Vitreous, hand-crafted tiles with the custom-look of antiquity in hues of White, Ivory, Champagne, Marine, or even Silver, Gold or Brass to name a few.*

*"Venezico" is designed to add tessellated elegance to interiors and exteriors, weathers all seasons and time itself!*

*Mesh mounted on 12"x12" sheets, for easy installation at low cost. Matching trimmers available. For further information, write to:*

Latco® PRODUCTS

3371 GLENDALE BOULEVARD • LOS ANGELES, CALIF. 90039
TELEPHONE: (213) 664-1171

On Readers' Service Card, Circle No. 508

# Shouldn't the walls on the inside of a house last as long as the ones on the outside?

WALLBOARD WALLS WON'T STAND UP
TO THE TEST OF TIME. THEY WARP. AND PEEL.
AND COME APART AT THE SEAMS.
SO USE REAL PLASTER WALLS.
THEY'LL STAND UP AS LONG AS THE HOUSE.

**Keep New York Plastered.**
THE PLASTERING INSTITUTE OF GREATER NEW YORK

On Readers' Service Card, Circle No. 509


__Designed__ to provide unexcelled accuracy over beam length. __Built__ with all precision ball bearings to assure smooth response at any board angle. __Backed__ by a two-year unconditional guarantee against defects in parts or workmanship.

**Four standard Models up to 43½" x 72" size available . . . Write TODAY for complete information, specify Bulletin 1512-K-116 . . . Consul & Mutoh, Ltd., 518-26 Davis Street, Evanston, Illinois 60201.**

**MUTOH** . . . world leader in precision drafting machines.

On Readers' Service Card, Circle No. 481



On Readers' Service Card, Circle No. 366 ➤

# All you need to "individualize" this Rosewood Paneling is a roll of colored tape!

**Introducing new Georgia-Pacific Gold Crest Rosewood!**

G-P Gold Crest Rosewood Paneling has one-half inch wide vertical channels every 16 inches. You decorate these channels with easy-to-apply colored tapes. You can also use metal strips, fabric or tile to match the floor covering, furnishings or draperies. There are five beautiful hardwoods in our exclusive Gold Crest line: American Walnut, Distressed Heirloom Cherry, Golden Elm and Pecan. All of them are available in 4′ x 8′, 9′ and 10′ panels with G-P's incomparable Acryglas® finish.

GEORGIA-PACIFIC / THE GROWTH COMPANY

MORE

# "And I thought I knew all about my KOH-I-NOOR Rapidograph pen!"

FACT IS that many professional draftsmen DON'T know—or have forgotten—at least SOME of the special features, conveniences, superiorities and refinements of this famed and versatile drafting instrument.

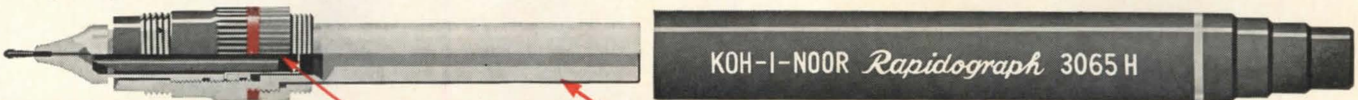
*Sponge in the cap! Keep it moist, and your pen will always be ready for instant use!*

*Offset on all point sizes assures there's no danger of smearing when working with French curve or straight edge.*

*Only truly interchangeable drawing point sections!*

*Automatic filling system in pocket model.*

*Kolor Koding indicates point sizes of all line-widths.*



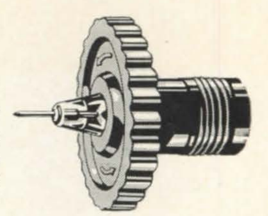

*Cleansing wire and weight protected by safety clip. Assembly cannot fall out!*

*Clamp ring (instead of friction fit) allows easy, fast fitting of cartridge and guarantees airtightness. You can't spill ink on fingers or work!*

*Airtight, self-contained reusable cartridge (magazine type), easily refilled. Visible ink supply gives you automatic quick-check of ink prior to attaching holder.*

*Cap for drawing point section has sponge to keep point moist and Kolor Koding to indicate point size.*

*Point removal is easy and fast with this exclusive Nib Key! (Write for free Nib Key if you do not have one.)*



## Now 64 Points to choose from!

8 Rapidograph hard-treated stainless steel points
8 Rapidograph (transparent) hard-treated stainless steel points
8 Acetograph hard-treated stainless steel points
16 Koh-I-Noor Rapidograph Jewel points, self-polishing, for drafting film
16 Koh-I-Noor Tungsten Carbide points, primarily for programmed automated drafting *machines*
7 Brushograph sizes for broad work, filling-in and opaquing
1 Koh-I-Fine Sign Pen point

## All Point Sizes including the "000"

The new super-fine "000" drawing point, providing a line only ten-thousandths of an inch in width, is now added to the point-sizes already provided. Also 7 brush sizes, and the Koh-I-Fine point. All are available either in pocket model or desk model KOH-I-NOOR technical fountain pens.

# KOH-I-NOOR

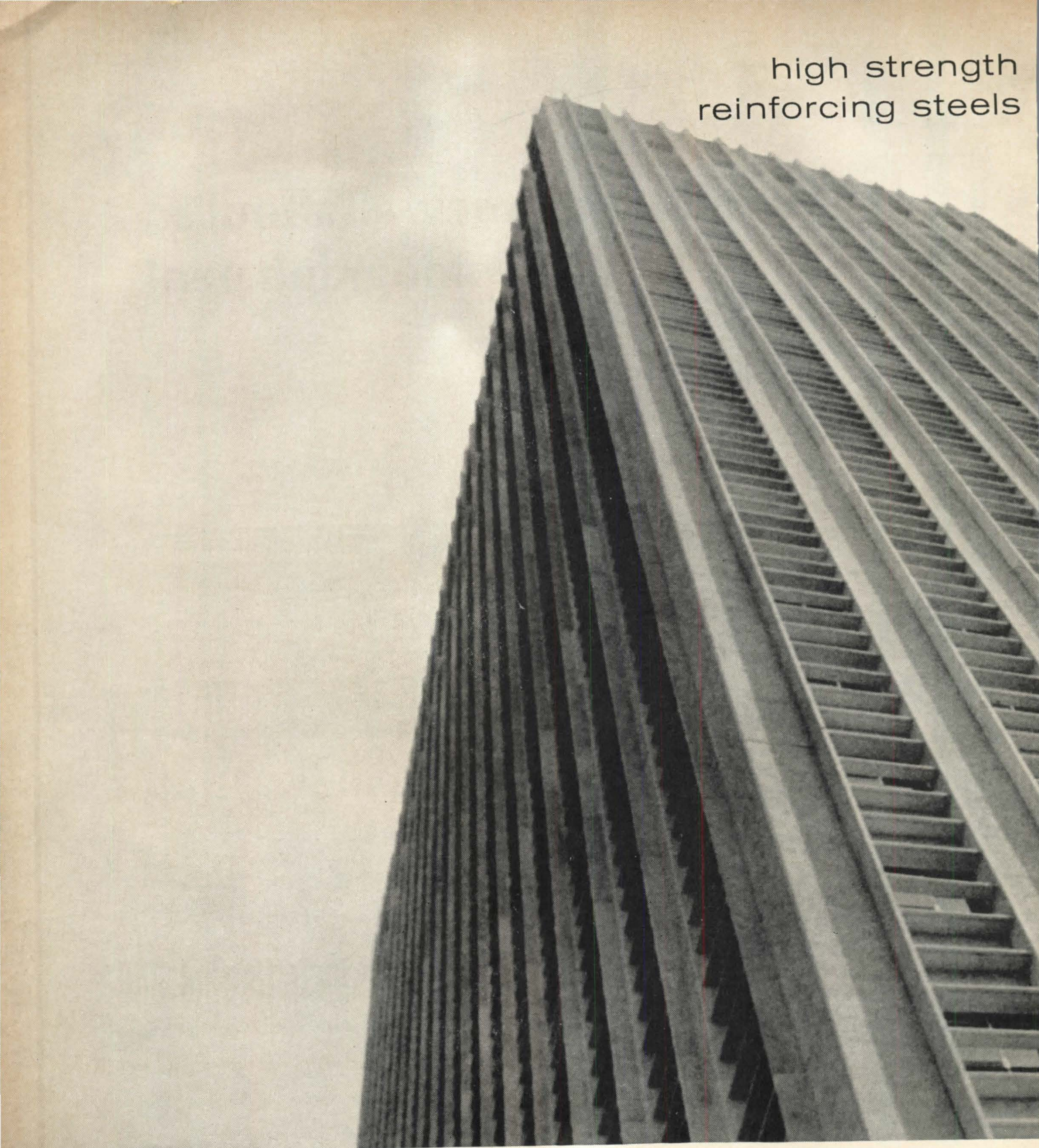
*See your Koh-I-Noor dealer or for descriptive literature, write to Koh-I-Noor, Inc., Bloomsbury 25, New Jersey*

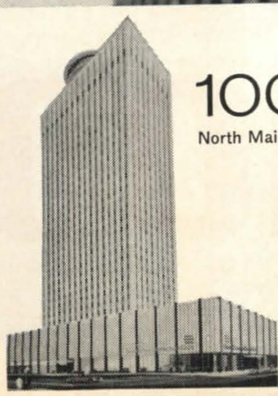


On Readers' Service Card, Circle No. 496



◄ On Readers' Service Card, Circle No. 366



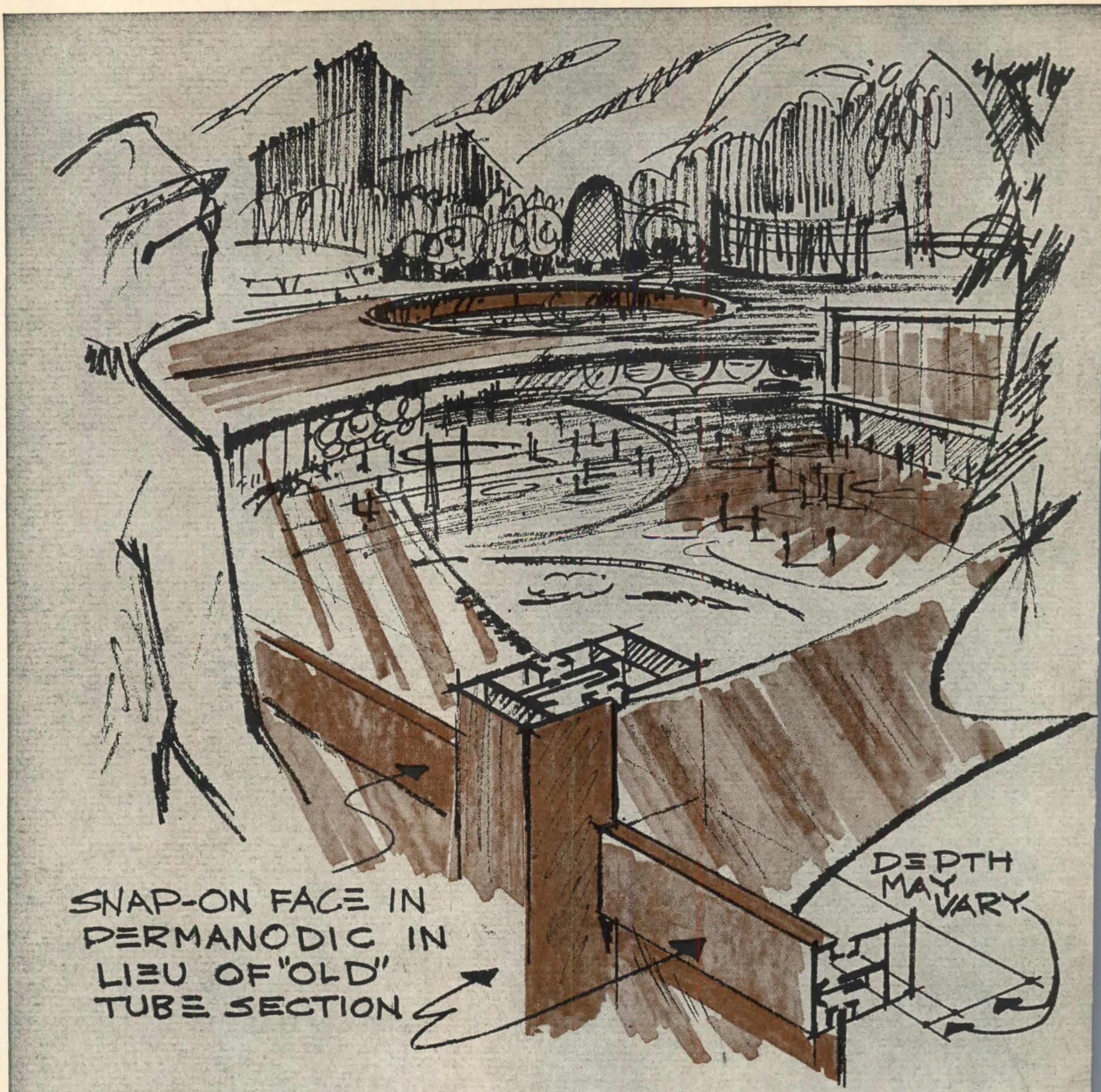



# 100

North Main Building, Memphis, Tennessee

Developer: Bloomfield Building Industries
Consulting Engineers: Ellers & Reaves

Architects: Robert Lee Hall & Associates
General Contractor: Southern Builders, Inc. of Tenn.

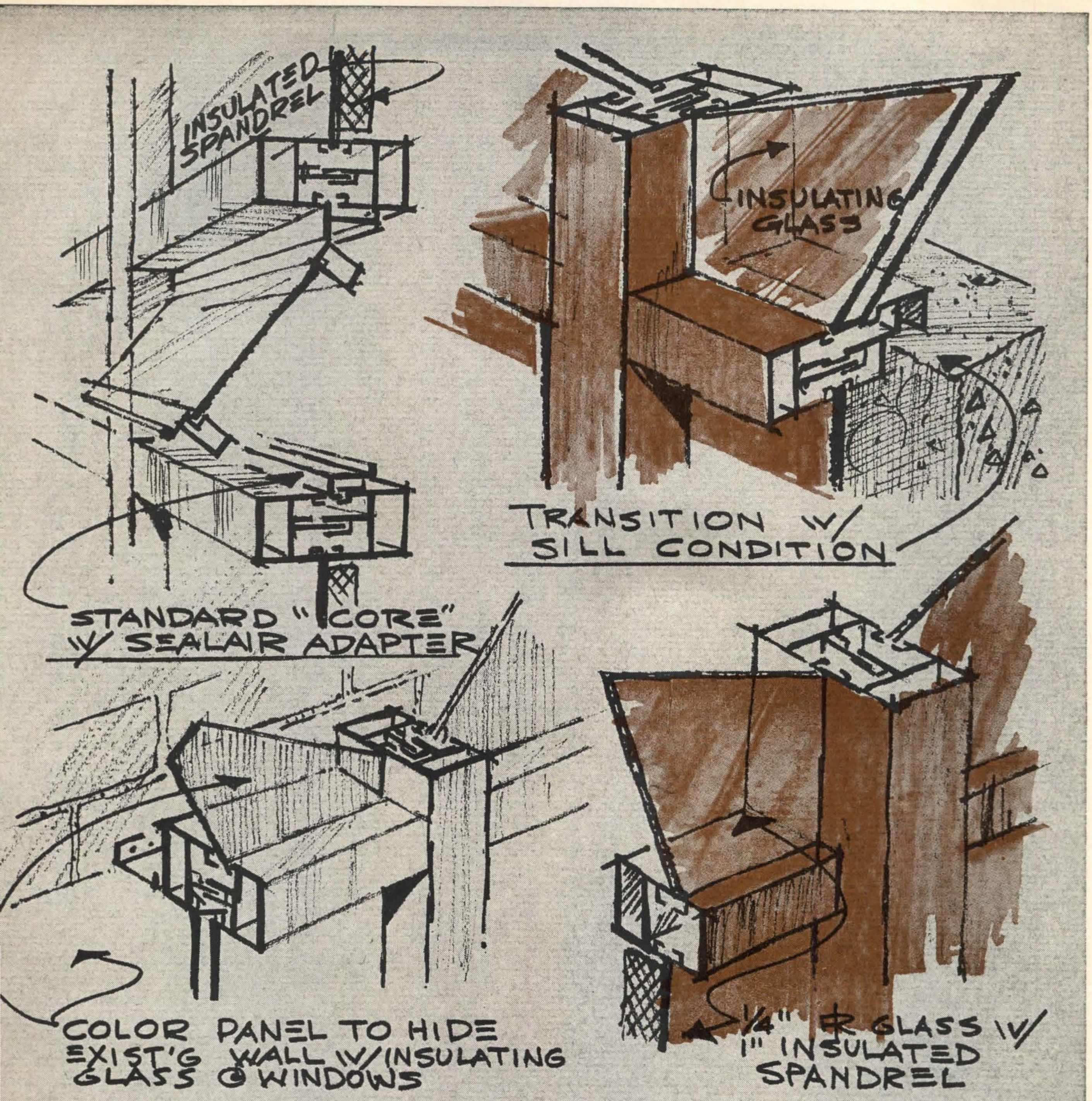



## Look at what you can

**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 ¼ 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"




## do with KAWNEER CORE

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 File No. C-64. Address Kawneer Core, 1105 N. Front Street, Niles, Michigan.

K kawneer

**Kawneer Company, a Division of American Metal Climax, Inc.** Niles, Michigan • Richmond, California • Atlanta, Georgia • Kawneer Company Canada, Ltd., Toronto, Ontario • Kawneer de Mexico, S.A. de C. V., Mexico City, Mexico • Kawneer Company (U. K.) Ltd., London • Kawneer GmbH, Rheydt, Germany • Showa Kawneer, Tokyo, Japan



*Trademark of Kawneer Co., Inc.



On Readers' Service Card, Circle No. 512

*Continued from page 324*

vice-presidents. GARFIELD S. RAWITSCH has been appointed administrative vice-president.

HOWARD JOHNSON COMPANY, New York, N.Y., has elected ROBERT E. TURNER vice-president, architect and construction, of Howard Johnson's Motor Lodge Division.

ALBERT KAHN, Associated Architects and Engineers, Detroit, Mich., have appointed D. H. SHANAN director of structural and civil engineering, and T. C. HALLIDAY administrator of the department; A. ZWEIG has been appointed chief structural engineer and F. KRAMRISCH has been named chief civil engineer. A. ANNALA has been appointed administrative assistant to the supervisory staff of the firm's architectural department.

KNOLL ASSOCIATES, INC., New York, N. Y., have named BARRY ROSENGRANT Assistant Divisional Manager of Knoll's western division and JAMES P. NORTON as regional manager.

CHARLES LUCKMAN ASSOCIATES, INC., Architects, Planners, New York, N.Y., have elected JAMES M. LUCKMAN to the board of directors.

The planning department of MARIN COUNTY, Calif., has appointed ALBERT SOLNIT, University of Cincinnati assistant professor of architecture, chief of advance planning.

HERMAN MILLER INC., Furniture Manufacturers, Zeeland, Mich., have named JOE SCHWARTZ manager of national accounts and government division, VICTOR PITZI, New York major market manager, and JOHN BUGLISI, showroom manager at 600 Madison Avenue.

P&W ENGINEERS, INC., Chicago, Ill., have named JOHN A. SBAROUNIS principal structural engineer.

REYNOLDS METALS COMPANY has named GUS STRAUS a development project director in the architectural construction section of their company's product development division in Richmond, Va.

### *New Partners, Associates*

BARRON, HEINBERG & BROCATO, Architects, Alexandria, La., announce that THILO STEINSCHULTE and ROBERT D. WYNNE have become partners.

GUNNAR BIRKETS & ASSOCIATES, Architects, Birmingham, Mich., have appointed JOHN D. HILBERRY and EDWARD G. ROSELLA associates.

CROOKS, MICHELL, PEACOCK & STEWART, Architects-Engineers, Chatswood, Australia, have named eight new associates: N.C. LOWE, J.W. NAIRN, R.J. JACKSON, W.R. MILLAR, E.R. PATTERSON, M. LLOYD JONES, L.P. HURST, K. MCDOWELL.

DANIEL COMM ASSOCIATES, Architects, Chicago, Ill., have named ALAN H. COMM a partner.

*Continued on page 338*

**URETHANE FOAM PROJECT REPORT**

# Builder News

Part of a series of product-use bulletins published by Mobay to keep architects, engineers, builders and contractors informed on new developments in urethane foam materials for the commercial and residential construction industries.

MOBAY

BN-5

## DESIGN VERSATILITY OF URETHANE FOAM SIMPLIFIES CONSTRUCTION OF YAMASAKI-INSPIRED MANUFACTURERS AND TRADERS TRUST BUILDING

The high thermal value and excellent bonding feature of sprayed-on urethane foam insulation make it an ideal material for the new 21-story Manufacturers and Traders Trust Company building, now under construction in Buffalo, reports Project Architect John Urban of Minoru Yamasaki and Associates.

Among reasons given for using urethane foam are that it provides maximum insulation at minimum thickness, is easily sprayed on during construction and conforms to unusual design shapes. It gave the builder greater flexibility, especially during the early, rough design stages and was a major factor in achieving the strikingly distinctive narrow vertical lines in column covers and sash mullions.

The urethane insulation was applied in a two-phase method in this project: It was sprayed onto the panels during fabrication and was sprayed in place after column covers and sash mullions were installed.

The exterior of the $12 million building consists of alternate courses of glass and stamped anodized aluminum panels, separated vertically by precast marble aggregate-concrete column covers. The U-shaped 12′-long covers are clipped at top and bottom to the floor slabs, leaving a ¾″ space between cover and column. Once in place, urethane is sprayed into the gap to fill the void and provide uninterrupted insulation with the previously sprayed panel surfaces.

Because urethane foam is an expandable void-filling material, the builder did not have to be overly concerned with variable dimensional tolerances or the intricacies of insulating the odd configurations of the unusually shaped panels.

The panels (manufactured by Kawneer, Niles, Mich.) have a double concave surface of variable depth, which ruled out rigid slab cores because they would have had to be carved, shaped and bonded individually. Other insulating materials were also considered before selecting the urethane system (supplied by Pittsburgh Plate Glass Co., Pittsburgh, Pa.).

The major problem with other insulating materials for the on-site phase of the project was found to be their inherent inability to be applied as an integrated part of the construction sequence once the curtainwall and column covers are in place.

**New Buffalo edifice joins growing list of high-rise buildings in which rigid urethane foam is used to gain functional benefits for the builder as well as for the eventual occupant.**

***Specification of all materials in this project was based on the building's minimum life expectancy of 75 to 100 years.***

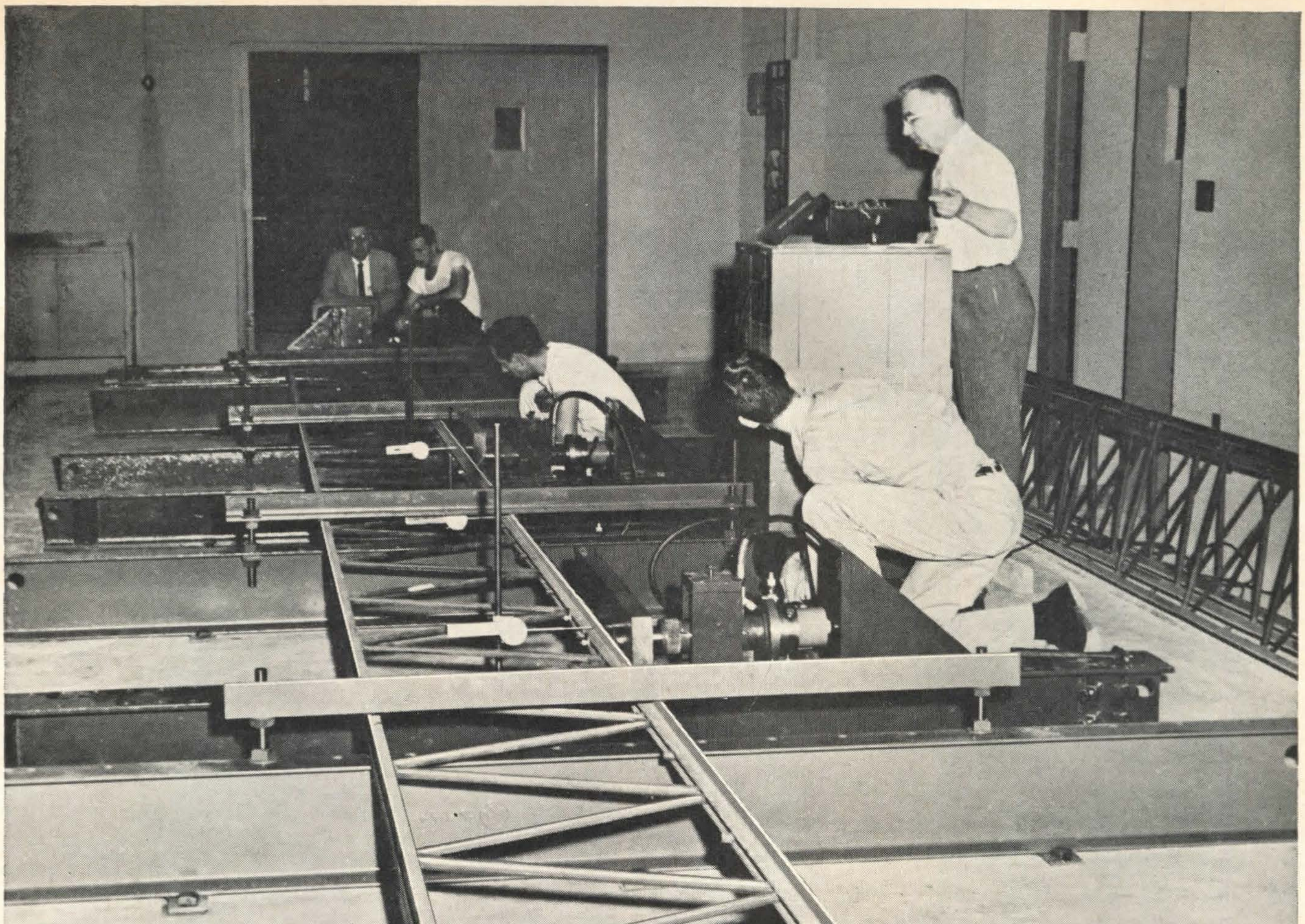
The 21-story, air-conditioned building features a 35′-high main banking floor, a 20th floor restaurant and a 100-car garage. It is designed on the 4′-10″ x 4′-6″ grid module throughout and has four high-rise and three low-rise elevators. Heat absorbing bronze glazing will cut glare and help reduce heat radiation.

| | |
|---|---|
| *Owner:* | Manufacturers and Traders Trust Co. Buffalo, N. Y. |
| *Architect:* | Minoru Yamasaki & Associates Birmingham, Michigan |
| *General Contractor:* | The John W. Cowper Co., Inc. Buffalo, N. Y. |

***For additional information on the use of urethane foam for insulation and construction, write on your letterhead to:***

**MOBAY CHEMICAL COMPANY, CODE PA-23, PITTSBURGH, PA. 15205**

**Title: Ensign Fire Extinguisher**
**Artist: The Ansul Company, Marinette, Wisconsin**
**Medium: Fiberglass**



*Continued from page 334*

Fred S. Dubin Associates, Consulting Engineers, Hartford, Conn., have named two new partners: Selwyn Bloome and Norman D. Kurtz.

Faulkner, Stenhouse, Fryer & Faulkner, Architects, Washington, D.C., have named Wynant D. Vanderpool, Jr., an associate.

Richard Haag Associates, Inc., Landscape Architects and Urban Planners, Seattle, Wash., have named Robert M. Hanna and Donald K. Sakuma as associates.

E.H. & M.K. Hunter, Architects, Hanover, N.H., announce that Edgar H. Hunter has been appointed vice-president of the architectural firm of Lyles, Bissett, Carlisle & Wolff, of Columbia, S.C., Washington, D.C., and Raleigh, N.C.

Kaeser & McLeod, Architects-Engineers, Madison, Wis., have named Marcus E. Weston an associate.

The Perkins & Will Partnership, Architects, Chicago, Ill., have elected three new partners: William J. McCoy, David L. Ginsberg, and David K. Pyle.

Rogers, Taliaferro, Kostritsky, Lamb, Architects, Baltimore, Md., have appointed George John Pillorge an associate.

Richards, Bauer & Moorhead, Architects-Engineers, Toledo, Ohio, have named four new associates: L. Edward Kime, Dennis W. Queenan, H. Richard Hanson, and James B. Erhard.

Slingerland & Booss, Architects, Engineers, New York, N.Y., has named Joseph J. Mangan an associate.

Smith, Hinchman & Grylls Associates, Inc., Architects-Engineers-Planners, Detroit, Mich., have named William R. Jarrat an associate.

John Carl Warnecke & Associates, Architects, San Francisco, Calif., announce that Robert Lamb Hart and Michael Painter have been made partners.

Whittlesey, Conklin & Rossant, Architects and City Planners, New York, N.Y., have named Burton William Berger, an associate partner.

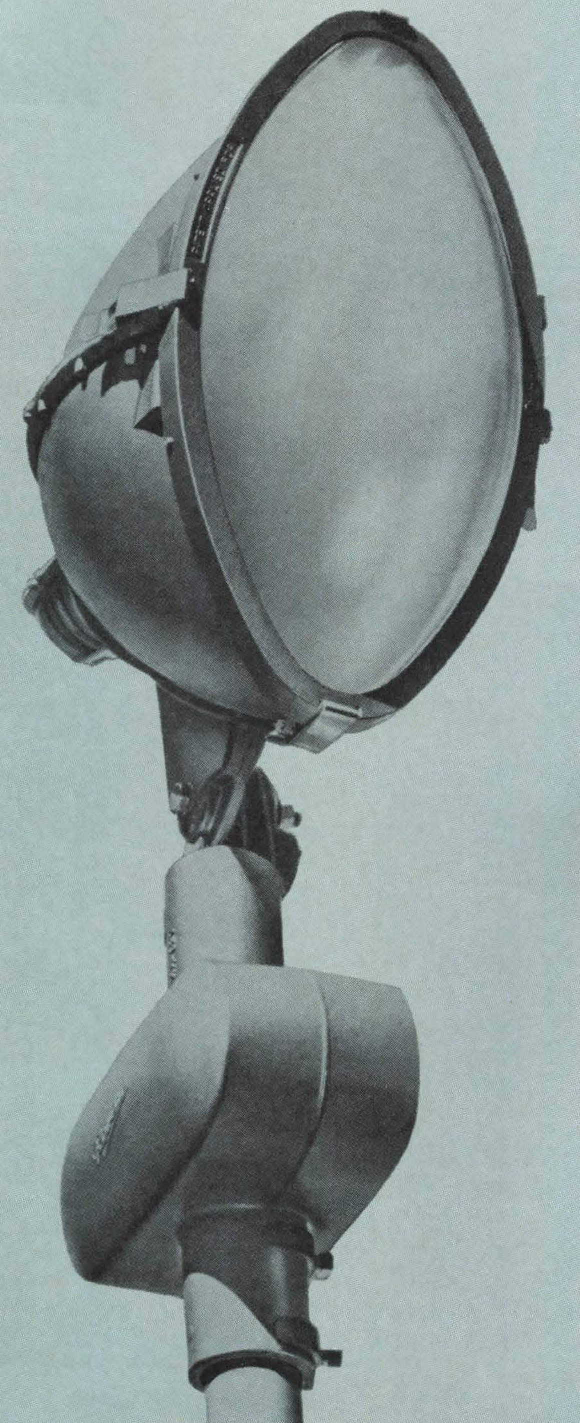
Abraham Woolf & Associates, Inc., Consulting Structural Engineers., Boston, Mass., have made C. Andrew Pretzer an associate member of the firm.

### *New Addresses*

Marvin I. Adleman, Landscape Architect, 605 Liberty Trust Building, Broad and Arch Streets, Philadelphia, Pa. 19107.

Affleck, Desbarats, Dimakopoulos, Lebensold, Sise, Architects, 1015 Saint Alexander St., Montreal 3, Quebec.

*Continued on page 344*



# Unusual shape?

# Perhaps.

It all depends on your point of view. Some people tell us that it looks like the eye of a cat from the front. And like a TV tube from the rear. Ugly? Functional? Why the shape?

Very simple: we pack more wallop (wide usable beam plus maximum utilization) into our Series 1100 than is possible with any conventional floodlight. We say, and we can prove it, that we guarantee more light where you want it, with controlled vertical distribution, and at lower cost. Big words? Big light!

And a few details of design and construction. Three, not two, stainless spring steel latch assemblies secure the precision cast aluminum door frame. The Series 1100 reflector is a combination of elliptical, parabolic, and spherical contours. Specially designed gasketing assures a dustproof, weathertight cushion seal between glass and door and between door and reflector housing. A built-in protractor speeds up exact positioning. A customized high temperature sealant in a grooved channel guarantees weathertight gasketing.

We could go on and on. But why don't you let us send you our new, illustrated, 8-page Bulletin No. 1100 . . . which tells the whole story in print on our Series 1100 heavy duty outdoor mercury floodlight, available in 400 or 1000 watt. Better still, let us arrange a demonstration under your actual conditions of use. Sales representatives in leading cities.

**WRITE FOR BULLETIN 1100**

**REVERE**

***FORWARD THINKING IN OUTDOOR LIGHTING***

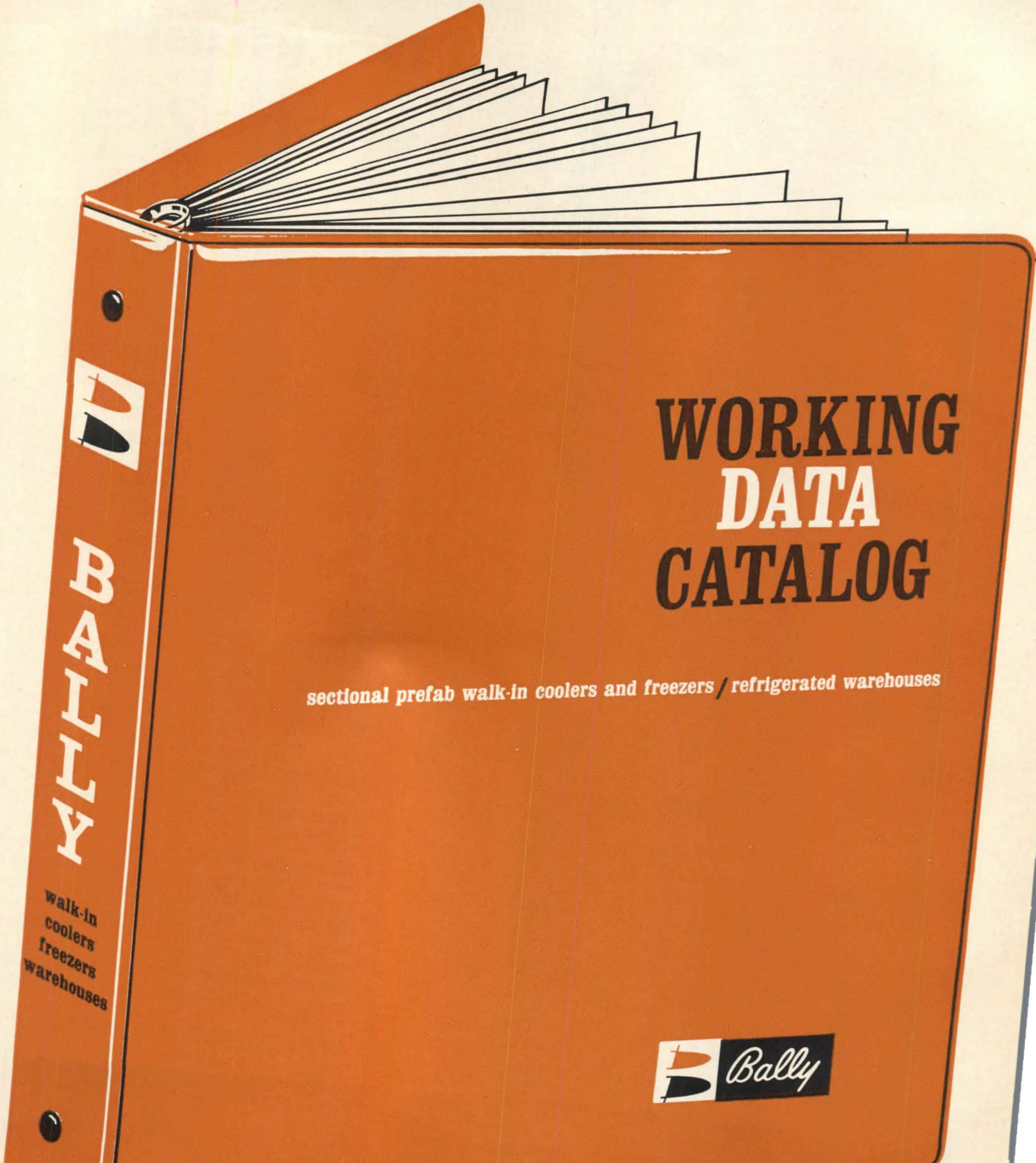
**REVERE ELECTRIC MANUFACTURING CO.**

7420 NORTH LEHIGH AVENUE · CHICAGO, ILLINOIS 60648



On Readers' Service Card, Circle No. 464

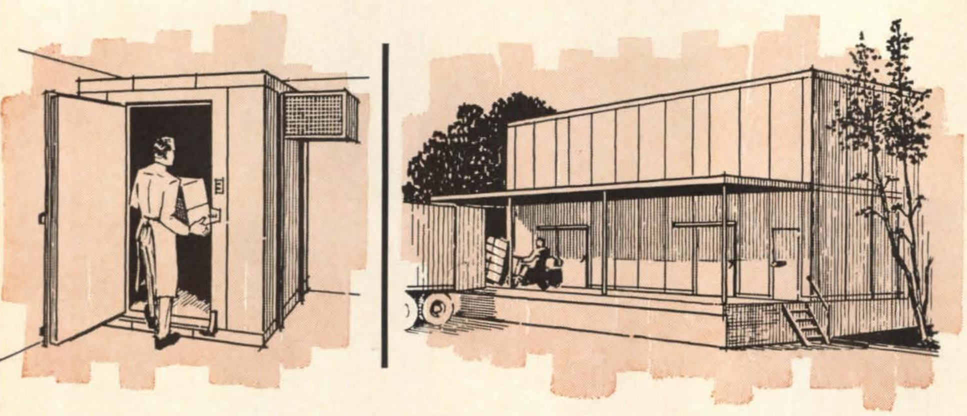
# Here's what Bally gives you to work wit



# in a new 100-page catalog!

## INDEX

**The most comprehensive data ever prepared about prefab Walk-In Coolers, Walk-In Freezers and Refrigerated Warehouses. Write for your copy.**



All sizes, from small Walk-In Coolers and Freezers to Giant Warehouses can be assembled from Bally standard prefab sections.

**1** — **GENERAL DESIGN INFORMATION** includes samples of 3 available metals

**2** — **SIZES, CAPACITIES AND WEIGHTS** of 21 popular models

**3** — **DOOR ARRANGEMENTS** shows doors that fit every need

**4** — **FLOORS** prefab and built-in types

**5** — **OPTIONAL ACCESSORIES** description of shelves, rails, floor racks, and weather-proof roofs

**6** — **REFRIGERATION, ELECTRICAL DATA** on self-contained and remote systems

**7** — **SPECIFICATIONS** for use in preparing general specifications

**8** — **DRAWINGS and PHOTOS** of 36 different installations

**9** — **REFRIGERATED WAREHOUSES** complete engineering and special data

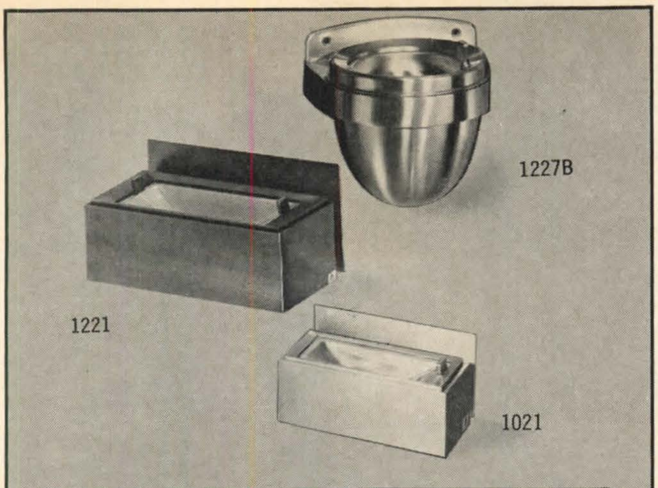
**10** — **MISCELLANEOUS** names of users, price information and engineering changes

**Bally Case and Cooler, Inc., Bally, Pennsylvania**

Address All Correspondence to Dept. PA-10



On Readers' Service Card, Circle No. 332




# Wall Urns

The world's finest buildings are equipped with DUK-IT maintenance saving wall urns. All popular metal finishes to blend or contrast with the building interior. **Ask to see the new 1121, extruded aluminum design.**

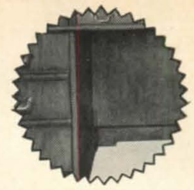
Write for complete catalog.

**DUK-IT** McDONALD PRODUCTS CORPORATION
**252** Duk-It Building • Buffalo, New York 14210

On Readers' Service Card, Circle No. 396

# DENSIWOOD®

**the hidden hallmark of quality**
***that assures lifetime durability***



Desk by Mount Airy

The Exclusive Densiwood process gives rich, warm woods the mar-proof durability of a diamond.

The manufacturers of fine wood desks who use Densiwood for centerposts, moldings, panel bands and other wear points are insuring their furniture for lifetime beauty . . . *against dents, scratches, scuff-marks . . . and nylon-snagging splinters.* In your selection of fine office and library equipment, remember to specify DENSIWOOD-PROTECTED furniture. Contact the manufacturers below for complete details:

COLE STEEL EQUIPMENT CO. • HOOSIER DESK CO. • IMPERIAL DESK CO. • INDIANA DESK CO. • THE JASPER DESK CO. • JOFCO THE LEOPOLD CO. • B. L. MARBLE FURNITURE CO. • MOUNT AIRY FURNITURE CO.

A product of: **LUNDSTROM LABORATORIES, INC.**
900 Smith Street, Herkimer, New York

**Represented by:** Travis-Applegate Co., Grand Rapids, Mich. Charles Newsom, Charlotte, N. C., Zed Logan Co., St. Louis, Mo.

On Readers' Service Card, Circle No. 392


On Readers' Service Card, Circle No. 431

*Continued from page 338*

Armond Bartos & Associates, Consulting Engineers, 86 Third St., San Francisco, Calif.

Gunnar Birkerts & Associates, Architects, 909 Haynes St., Birmingham, Mich.

Diamond, Redfern & Partners, 186 Derby Road, Nottingham, England.

Derthick & Henley, Architects, Gateway Professional Building, Chattanooga, Tenn.

Dobush, Stewart, Bourke, Longpre, Marchand, Goudreau, Architects, 506 St. Catherine Street East, Montreal 24, Canada.

Fairfield & Dubois, Architects, 45 Charles St. East, Toronto 5, Ontario, Canada.

Royal McClure, Architect, 1502 IBM Building, Seattle, Wash.

Alfred L. Mell, Architects and Engineers, North La Salle Street, Chicago, Ill. 60602.

Progressive Design, Ltd., 160 Bulkley Building, Cleveland, Ohio.

Bernard Rothzeid, Architect, 104 East 40th Street, New York, N.Y. 10016.

Wells M. Squier, Environmental Designer, 220 D, Commercial Boulevard, Lauderdale-by-the-Sea, Fla.

Nandor Szilard, Planner, 1224 Old Concord Road, Monroeville, Pa. 15146.

James L. Wadley, Architect, 970 Clark Ave., Yuba City, Calif.

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

Werner Gantenbein, Architects, Mommsenstr. 18, Zürich, Switzerland.

### *Name Changes*

Beaudin & Moulton, Architects, Burlington, Vt., upon the formation of a partnership; formerly, MARCEL BEAUDIN.

Briscoe & Berry, Architects, Eugene, Ore., upon the formation of a partnership; formerly, JOHN L. BRISCOE.

Budina, Freeman, & Gilbert, Architects, Richmond, Va., upon the admission of Ernest R. Gilbert as partner; formerly, Budina & Freeman.

Leonard Busch Associates, Consulting Engineers, Trenton, N.J., upon the formation of a partnership with Phillip Paul.

Callins & Associates, Corpus Christi, Tex.; formerly VERNOR & CALLINS.

Clark & McCall, Architects, Hartsville, and Kingstree, S.C., upon the formation of a partnership; formerly CLARK, MC-CALL & LEACH.

Deeter. Ritchey. Sippel, Architects, Pittsburgh, Pa.; formerly DEETER & RITCHEY.

*Continued on page 350*


DAP '1012' saves time because it doesn't require painting. Blends perfectly with the color of aluminum sash.

Specify it for glazing aluminum, steel, bonderized-galvanized and bronze metal sash, outside or inside. Knifes easily. Ready for immediate use. Will not crack, chip or powder. Sets tight and stays semi-elastic to withstand flexing of sash resulting from vibration and thermal expansion and contraction. Meets Interim Federal Specification TT-G-00410c.

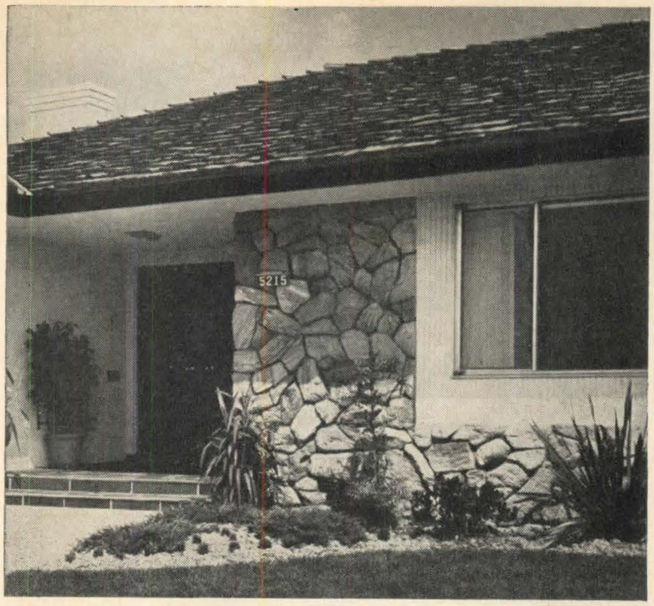
DAP '1231' Flexiglaze® is not subject to shrinkage because it's formulated from 100% solids—the finest synthetics and inerts. Adheres to primed wood, metal, glass, porcelain—most any construction material. Documented in-the-field performance proves DAP '1231' is the finest channel glazing that can be specified for jobs requiring a flexible, waterproof seal that isn't affected by normal atmospheric conditions.

**DAP®**
**ARCHITECTURAL SEALANTS**

*Write for Technical Data Bulletins or see our complete listing in Sweet's File $\frac{3c}{Da.}$*

**DAP INC., DEPT. PG, GENERAL OFFICES: DAYTON, OHIO 45431 · SUBSIDIARY OF *Plough, Inc.***


On Readers' Service Card, Circle No. 348



# Natural stone beauty for $1.00 more than brick

You can dress up your new construction with the rugged enduring beauty of stone by spending about $1.00 more per square foot than you do for face brick. In-the-wall costs vary by area, but one ton of FEATHEROCK Veneer equals the coverage of five tons of other stone. Special footings are unnecessary, and the light weight and flat back make FEATHEROCK go up faster.

Acoustical and insulation values are plus benefits.

**Are we sure of our low cost?**

We have good dealers all over the country, and we are so sure of our pricing now that if you're building twenty-five units or more, or designing a building that uses 2500 square feet or more of stone, I will *personally* see to it that you're given a realistic bid on complete in-the-wall costs.

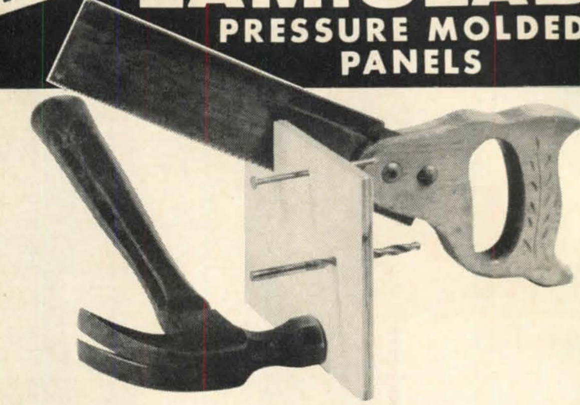
Write to me, Wayne Miles, President, FEATHEROCK, INC., on your letterhead and you will get prompt action. Our address is 6331 Hollywood Boulevard, Los Angeles, California 90028.

**featherock.**

AN AFFILIATE OF
UNITED STATES PUMICE COMPANY

On Readers' Service Card, Circle No. 360

NOW! . . . a great new material
**LAMICLAD®**
**PRESSURE MOLDED PANELS**



Use LAMICLAD fiberglass/plywood laminated panels for all types of building construction. They're high pressure molded to provide a super strength, smooth, attractive panel for use in:

- **Curtain Walls • Facade Panels • Balcony and Terrace Dividers**
- **Shower Stalls and Bathroom Walls • Commercial Refrigerator Walls**
- **Column Facing and Concrete Forming • Counter & Store Fixture Tops**
- **Commercial, Factory & Bathroom Partitions • Hospital and Lab. Walls**

LAMICLAD panels are easily installed to give long service, even under high impact and abrasion, and at temperatures from 300°F to —40°F.

They do not need painting.

Get all the facts about this great new building material.

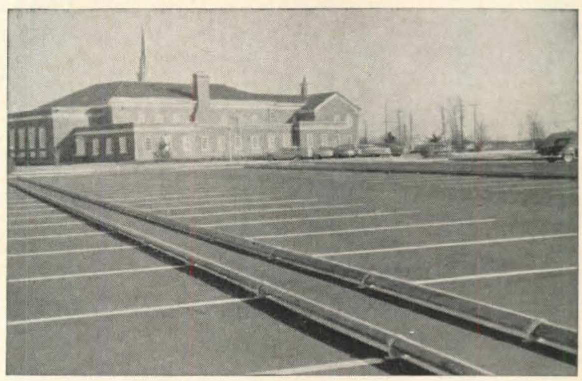
**Write, wire or call.**

**LAMICOR PLASTICS**

Division of Strick Corporation
525 Davisville Road, Willow Grove, Pa.
Phone: (215) 657-0350

On Readers' Service Card, Circle No. 385

## HAR-BAR Parking Barriers



**Good Parking is Good Business**

HAR-BAR Parking Barriers are the most practical ever developed. Anchor to any type surface to form individual, straight or curved lineal barriers. The thrust is down, there is no shear. Heavy duty metal saddles hold treated or painted timbers above the surface for drainage and longer life. Models range from light weight to heavy duty. Each installation custom planned.

PARKING LOT PLAN BOOK

Send for the latest edition of our "Parking Techniques". A.I.A. File No. 14A.

**HARRIS-BARRIER, INC.**

**P. O. Box 88243 • Indianapolis, Indiana 46208**

On Readers' Service Card, Circle No. 370

On Readers' Service Card, Circle No. 503

Design Versatility—The decorative stainless steel screen on this 1200-car, four-level municipal parking garage permits ventilation but protects neighbors from headlight glare. City of White Plains Parking Garage, White Plains, N.Y. Designers and Engineers: Abbott, Merkt & Co., New York, N.Y. Stainless steel screen facade: Trio Industries, Inc., Bridgeport, Conn.


# *Public building designs in nickel stainless steel assure taxpayers of money well spent.*

They know stainless. It's in their sinks, ovens, flatware, transit cars, hardware and appliances.

They're familiar with its strength. Its corrosion resistance. Its beauty. Its low maintenance requirements. Its long life. And value.

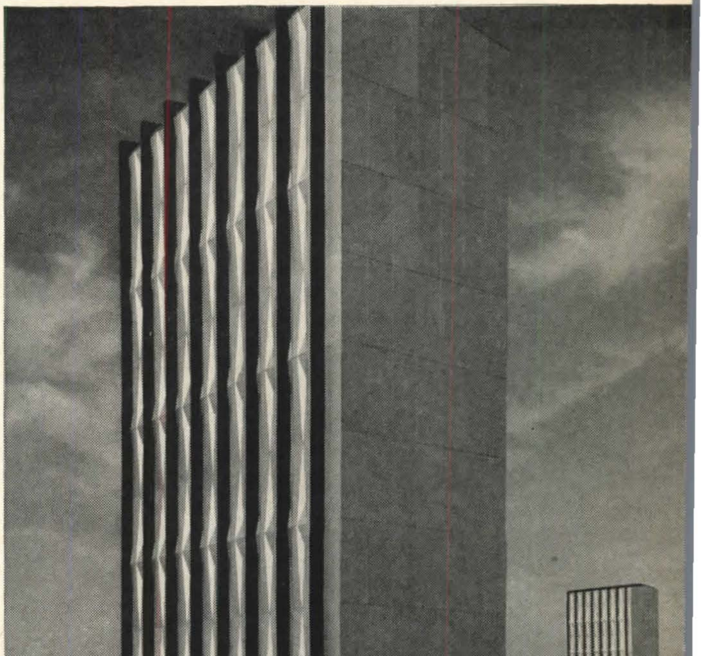
When they see stainless in and on the public buildings you design, they'll appreciate that their tax dollars are being used wisely. Functionally. Economically.

Isn't nickel stainless steel the ideal material for designs where public funds are involved? For more information on the design advantages of nickel stainless steel, write for "Stainless Steel Architectural Fact Sheet" and Inco's "Suggested Guide Specifications for Stainless Steel Products." Their format follows AIA Specification Worksheets. The International Nickel Company, Inc., 67 Wall Street, New York, N.Y. 10005.

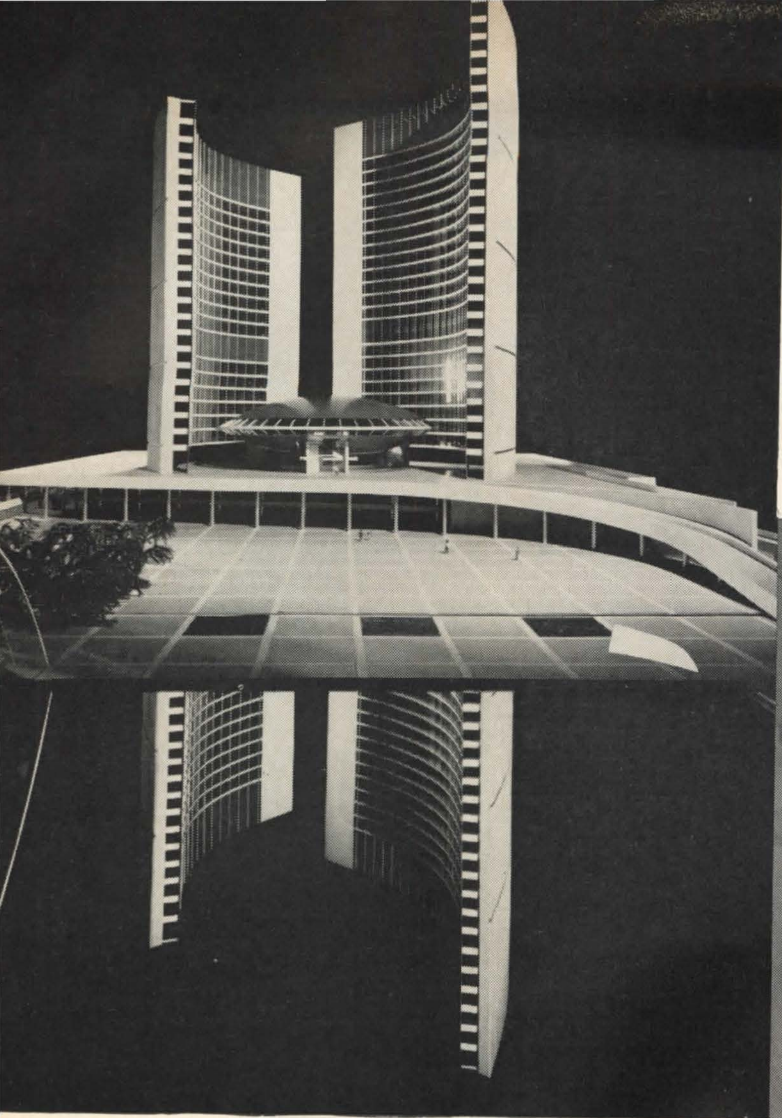
**INTERNATIONAL NICKEL**
Nickel—its contribution is quality

Stainless Steel

On Readers' Service Card, Circle No. 376

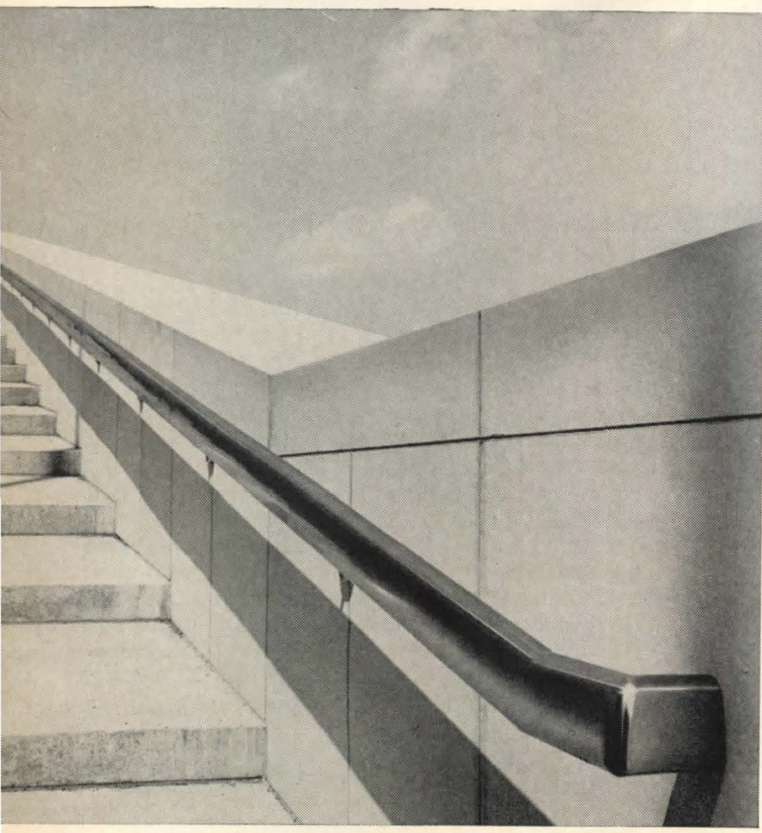


**Corrosion Resistance**—These intake gate structures, each nearly 100 feet high, are clad with matte-finished stainless steel panels for strength and stability in a corrosive environment. Niagara Power Project, Niagara Falls, N.Y. Engineers and Designers: Uhl, Hall and Rich, Boston, Mass. Architectural Consultant: John B. Peterkin, New York, N.Y. Stainless steel panels: General Bronze Corp., New York, N.Y.



**Economy**—Over 250,000 pounds of stainless steel were specified for curtain wall mullions, window frames and louvers in this striking civic government complex at a price within 4½ per cent of the lowest bid received on any other metal. This small initial difference will be quickly offset by savings in maintenance. Toronto City Hall, Toronto, Ontario, Canada. Architects: Viljo Revell, Helsinki, Finland, in association with John B. Parkin Associates, Toronto, Ontario, Canada. Stainless steel curtain wall mullions, window frames, louvers and entrances: Canadian Rogers Eastern Ltd., Toronto, Ontario, Canada.

**Durability**—Lustrous stainless steel fluted panels and flush doors were specified for this public library for their contemporary appearance and their ability to resist soiling and scuffing. Buffalo and Erie County Public Library, Buffalo, N.Y. Architects: James W. Kideney and Associates and Paul Harbach and Elon B. Clark, Jr., Buffalo, N.Y. Stainless steel panels and doors: The Michaels Art Bronze Co., Covington, Ky.



**Prestige**—Stairway leading to a second floor terrace has handrails of polished stainless steel set into a marble balustrade. Lamps are concealed inside the rail to illuminate steps after dark. Smithsonian Institution Museum of History and Technology, Washington, D.C. Architects: McKim, Mead and White, New York, N.Y. Stainless steel stairway railing: Alexander Metal Products Corp., Falls Church, Va.

*Continued from page 344*

DEMARS & WELLS, Architects, Berkeley, Calif., upon the formation of a partnership; formerly, DE MARS & REAY.

THE DRAKE PARTNERSHIP, Architects, St. Louis, Mo.; formerly DRAKE O'MEARA ASSOCIATES.

ECKERLIN-KLEPPER-HAHN, Consulting Engineers, Syracuse, N.Y., upon the formation of a partnership; formerly, FRANCIS A. HAHN.

FITZGERALD & KAPLAN, Structural Engineers, San Francisco, Calif.

THE FREEMAN-WHITE ASSOCIATES, Charlotte, N.C.; formerly, WALTER HOOK ASSOCIATES.

GLASS & GLASS, Architects, New York, N.Y., upon the formation of a partnership; formerly, M. MILTON GLASS.

HOWELL DESIGN CORPORATION, New York, N.Y., Industrial and Interior Designers; formerly, HOWELL DESIGN ASSOCIATES.

LAWRENCE E. MATSON & ASSOC., Architects and Engineers, Idaho Falls, Idaho; upon the appointment of DONALD M. TROTTER as associate; formerly, LAWRENCE E. MATSON.

MELONI & VOGEL, Architects, Morrisville, Pa., upon the formation of a partnership.

MILSTEIN, WITTEK, DAVIS & HAMILTON, Architects, Buffalo, N.Y., upon the formation of a partnership; formerly, MILTON MILSTEIN & ASSOC.

I.M. PEI & PARTNERS, Architects, New York City, New York; formerly I.M. PEI & ASSOCIATES.

DONALD REAY, Architect and Planner, Berkeley, Calif., upon the termination of a partnership; formerly, DE MARS & REAY.

SAPPENFIELD-WIEGMAN-HALL Associates, Architects, Asheville, N.C., upon the association of CHARLES M. SAPPENFIELD, JAN M. WIEGMAN, and JOSEPH K. HALL for the practice of architecture.

SIEGAL-AVRIN ASSOCIATES, architects, Detroit, Mich., upon the admission of GERALD M. AVRIN as a partner; formerly LEONARD G. SIEGAL ASSOCIATES, Architects.

LINN SMITH, DEMIENE, KASPRZAK, ADAMS, Inc., Architects, Birmingham, Ala.; formerly LINN SMITH ASSOCIATES, Inc.

STEWART, NOBLE, CLASS & PARTNERS, Architects, Philadelphia, Pa.; formerly MARTIN, STEWART, NOBLE & CLASS.

TOFANI & FOX, Architects and Planners, Philadelphia and West Chester, Pa., upon the admission of HARRY ROBERT FOX to the firm as a partner; formerly ARTHUR M. TOFANI JR. ASSOCIATES.

WALSH & OBERG, Architects, Phoenix, Ariz.; formerly, STEPHENS, WALSH, EMMONS & SHANKS.

WILLSON & WILLIAMS, Architects and Planners, Corona Del Mar, Calif.; formerly MURTON H. WILLSON.

### *New Branch Offices*

ATCO INDUSTRIES LTD. announces the opening of a branch office in Bangkok, Thailand.

LEONARD G. GEINEN, Architect, announces the opening of a branch office at 2159 Center Ave., Fort Lee, N. J.

### *Miscellaneous*

A. B. BENSON & COMPANY, Architects, Mobile, Ala., announces that CHARLES E. ROGERS has joined the firm.

BOLT BERANEK & NEWMAN, INC. Acoustical Consultants and Researchers, Boston, Mass., announce that DR. ISTVAN VER, C. WILLIAM GOYDER, and PETER BENTIVEGNA have joined the staff.

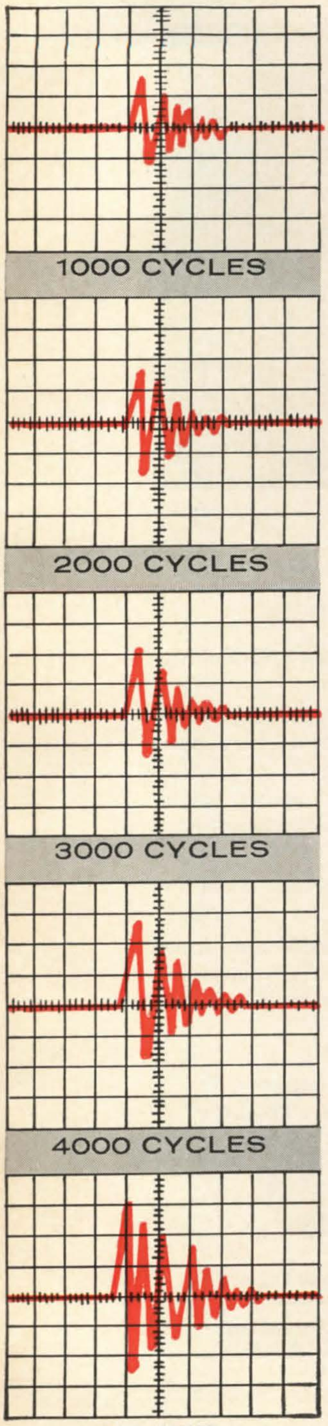
CROW, LEWIS & WICK, Architects, and THEODORE J. KAUFFELD, Consulting Engineers, New York, N.Y., announce their association.

RICHARD A. GOOD, Architect, former chief of the Planning Branch, Federal Aviation Agency, has joined the National

*Continued on page 352*

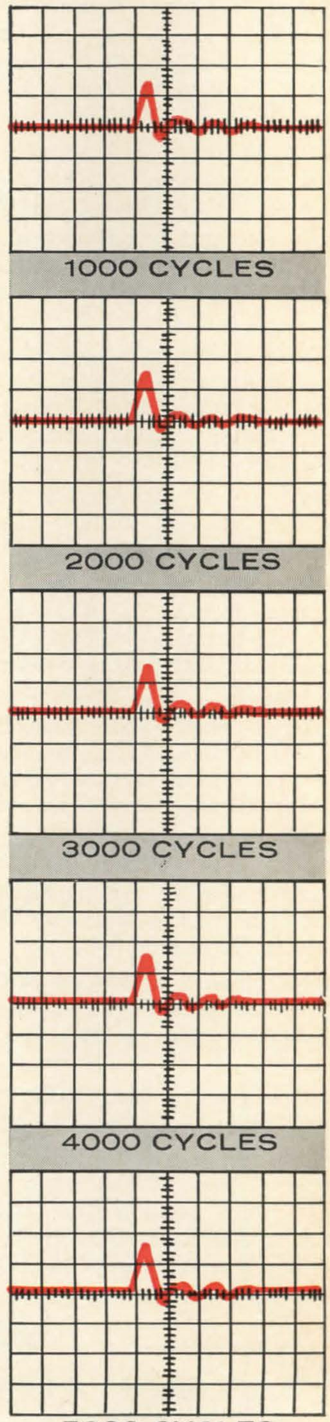
# WHICH ONE *safeguards piping systems against water hammer?*

## AIR CHAMBER




**UNIT FAILED COMPLETELY AT 4500 CYCLES EXCEEDING 300 P.S.I.**

## ABSORBOTRON® SHOCK ABSORBER




5000 CYCLES
**UNIT WILL PERFORM INDEFINITELY**

## TEST CONDITIONS

To evaluate the pressure of hydrostatic shock and to establish the shock absorbing efficiency of the Josam Absorbotron, a series of tests were conducted by a leading independent laboratory.* A fifty foot length of 1" pipe with water at 60 P.S.I. flow pressure and a velocity of 10 feet per second were used in these tests. The oscillographs compare the efficiency of the Absorbotron with a fully charged and properly sized air chamber: 1¼" pipe, 50 inches high.

RESULTS: The air chamber fails after approximately 4,500 shocks, while the ABSORBOTRON Shock Absorber continues to function with no difference in effectiveness even after 100,000 shocks. (4,500 shocks may result from one month's operation or less.)

How much proof do you need to be convinced that water absorbs the air in air chambers and that air chambers become ineffective unless recharged? How much proof do you need of the efficiency of Absorbotrons, especially when their cost may not only be less in the beginning, but certainly far less if you add the cost of recharging air chambers one or two times. Moreover, look at the savings in space — an 8" high Absorbotron provides complete protection against water hammer, while a 50" air chamber will not.

*For the complete story on the "Positive Control of Water Hammer" write for Manual SA-3.


JOSAM

**JOSAM MANUFACTURING CO.**

*Michigan City, Indiana*

**JOSAM PRODUCTS ARE SOLD THROUGH PLUMBING WHOLESALERS**

*Continued from page 350*

Capital Transportation Agency, Washington, D.C. developers of rapid rail system for the Washington area.

FRANK GRAD & SONS, Architects, Newark, N. J., announce that DAVID R. DIBNER has joined the firm.

HEERY & HEERY, Architects and Engineers, Atlanta, Ga., announce the acquisition of INTERIORS FOR BUSINESS.

LEVITT & SONS, INC., Builders, Lake Success, N. Y., announce that CLARENCE MONROE is retiring and that RUSSELL S. BODWELL will replace him as chief engineer.

MARCOU, O'LEARY & ASSOCIATES, Architects, Washington, D.C., announce that CHARLES TURNER has joined the firm.

ROY C. NEUMANN, Architect, has joined STANLEY ASSOCIATES, an affiliate of the Stanley Engineering Co., Muscatine, Iowa.

PARSONS, BRINCKERHOFF, QUADE & DOUGLAS, Consulting Engineers, New York, N.Y., and LORD & DEN HARTOG, Architects, Boston, Mass., announce their affiliation.

PERRY, DEAN, HEPBURN & STEWART, Architects, Boston, Mass., announce the formation of a Department of Preservation and Restoration.

SCHAFER, FLYNN, VAN DIJK & ASSOCIATES, Architects, Cleveland, Ohio, announce that MAUNO BACKLOND has joined the firm.

EBERLE M. SMITH ASSOCIATES, INC., Architects and Engineers, Detroit, Mich., announce that JOSEPH C. WATTS and EDWARD HAMMARSKJOLD have rejoined the firm.

THE STANLEY WORKS, New Britain, Conn., announces the appointment of JACK E. KEOWN as Marketing Manager, Contract Hardware.

THE UNIVERSITY OF COLORADO COLLEGE OF ENGINEERING, Boulder, Colo., has appointed GEORGE J. MALER Associate Dean.

VOIGT & FOURRE, Inc., Architects, have a new branch office at The Minnesota Federal Savings, Knollwood Plaza, St. Paul 1, Minn.

CORRECTION: MOREHOUSE, CHESLEY & THOMAS, Architects, have their sole office at 114 Waltham St., Lexington, Mass.

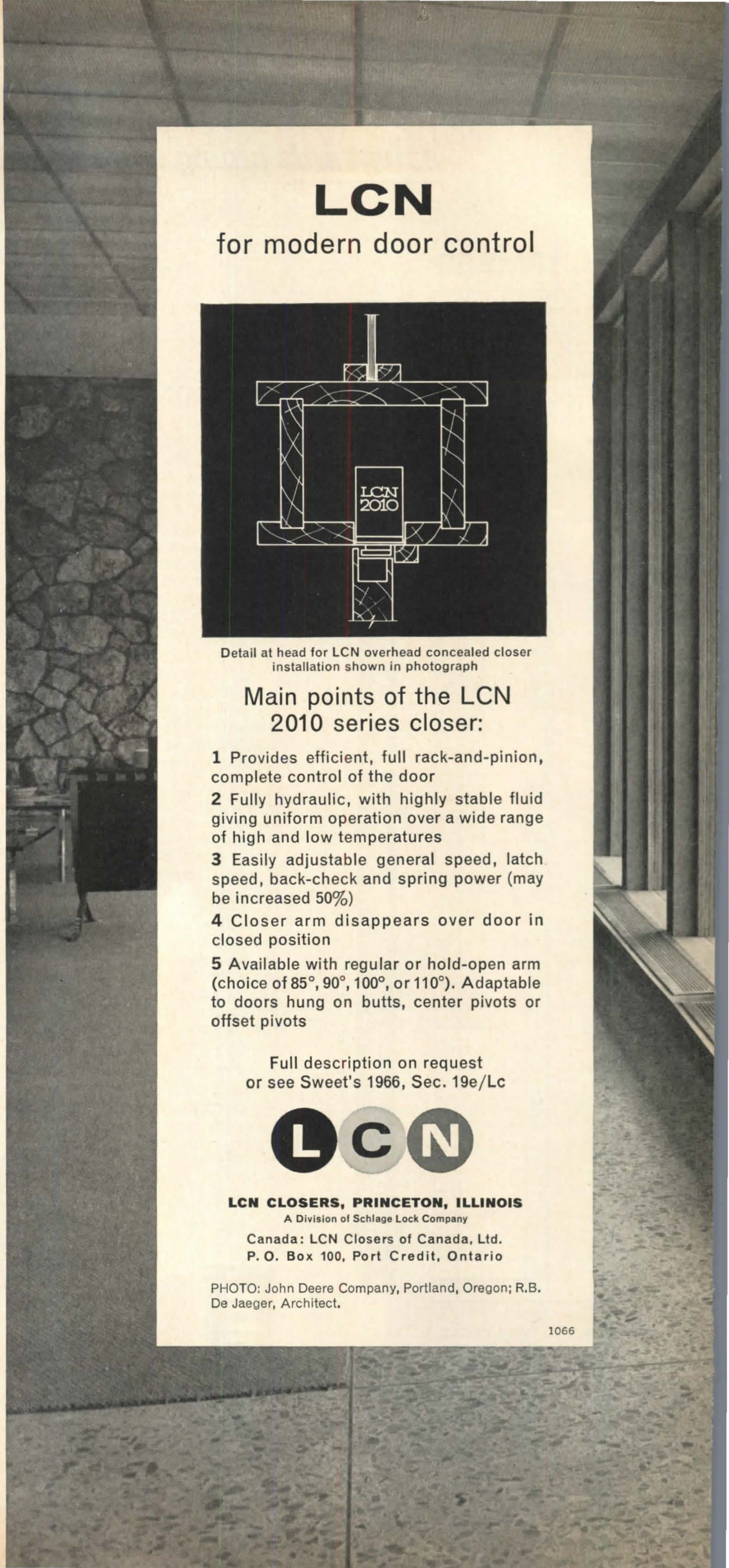
**WHEN YOU CHANGE YOUR ADDRESS**

Please report both new and old addresses directly to P/A five weeks before you move.

**PROGRESSIVE ARCHITECTURE**
**Circulation Department**
**430 Park Ave., New York, N. Y. 10022**

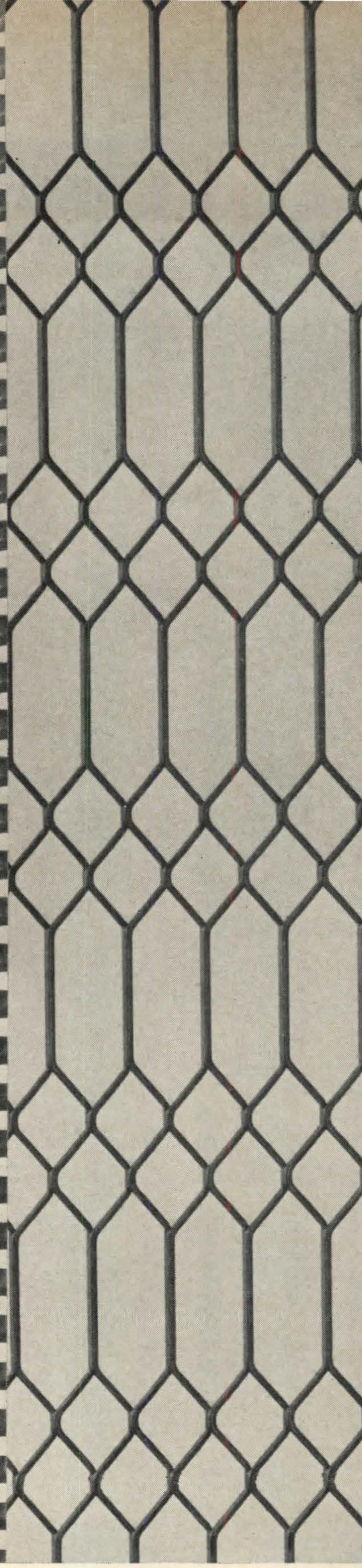


On Reader's Service Card, Circle No. 386 ➤

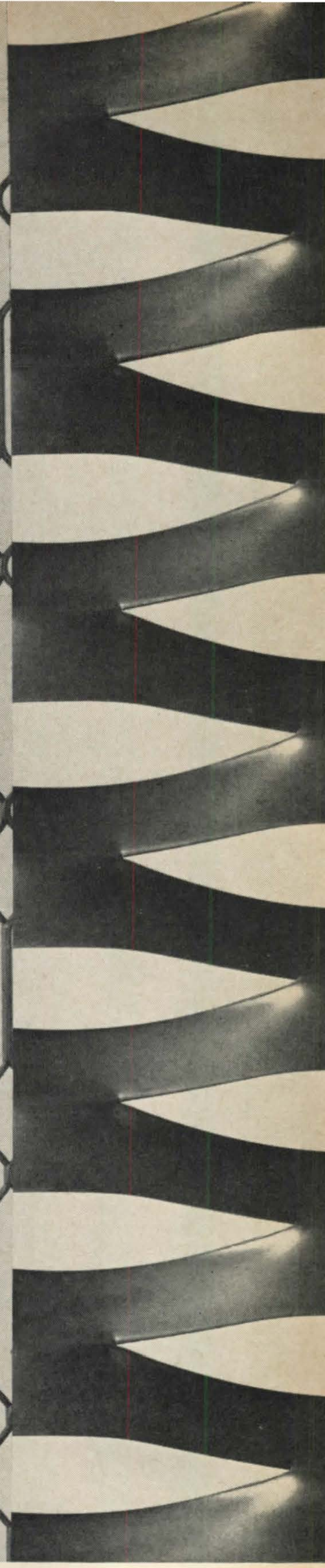


Cadet

½″ Facade

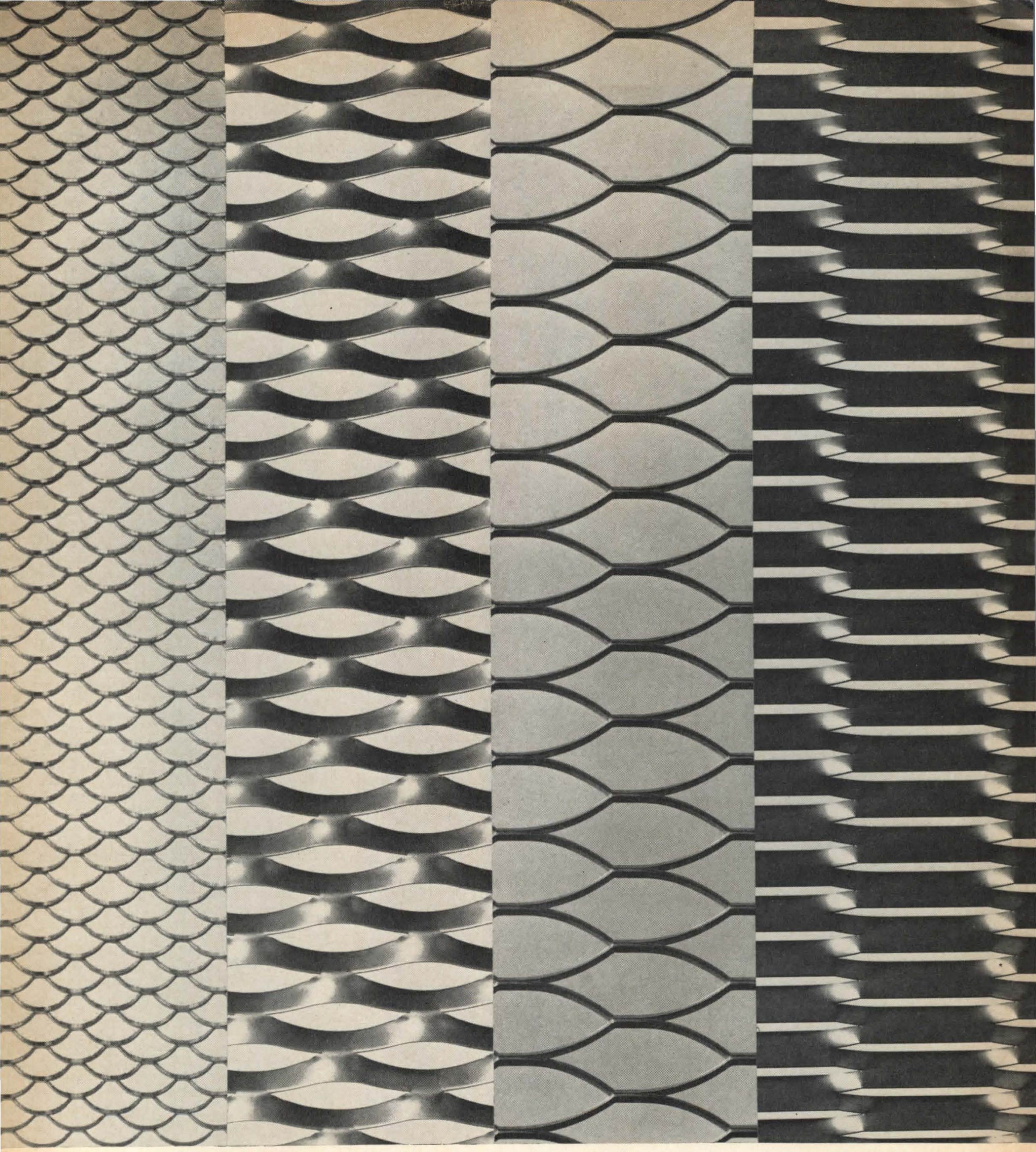


Arrowline



No. 4 Facade

**Would you believe it? This expanded metal is lighter per foot and stronger per pound than the solid *metal***



Drape Mesh | 1½″ Facade | Castle | Louvermesh

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

Have you written for our booklet about Architectural Mesh?

**Wheeling**

Wheeling Corrugating Co. Div. Wheeling Steel Corp., Wheeling, West Virginia

On Readers' Service Card, Circle No. 451

# JOBS AND MEN

## SITUATIONS OPEN

ARCHITECT & ARCH. ENGINEER—Permanent positions as project architects for graduates capable of handling all phases of work. Meet with clients, develop preliminaries, finals, and supervise construction. Excellent opportunity in small office in suburb of Hartford, Connecticut doing varied work throughout New England. Submit resume of education experience, availability, salary expected. Box #286, PROGRESSIVE ARCHITECTURE.

ARCHITECT—Or experienced lighting designer. To specialize in the application of integrated lighting. Send resume to Sylvan R. Shemitz & Associates, 1294 Chapel Street, New Haven, Connecticut.

ARCHITECTS—Bachelor's degree plus three years of professional experience. Salary range $9536 to $12,371. Apply Employment Services Branch, Civilian Personnel Office, U.S. Military Academy, West Point, N.Y. 10996. Nondiscrimination in employment.

ARCHITECTS—Key positions open in small, Northwest firm, serving religious, educational, institutional, recreational and commercial clients. Opportunity for challenge, growth, and advancement commensurate with ability and experience. Holland—Zucconi Architects, 606 Strain Building, Great Falls, Montana. Replies will be held in confidence.

ARCHITECTS—Minimum of three years experience on design or working drawings. Excellent opportunity for advancement in progressive office. Daverman Associates, Architects & Engineers, 924 Grandville, Grand Rapids, Michigan.

ARCHITECTURAL ACOUSTICS—Opportunities for young architects interested in careers in the growing and challenging field of architectural acoustics; positions available in Los Angeles, Chicago, New York and Cambridge. Please send resume to Robert B. Newman, BOLT BERANEK AND NEWMAN INC., 50 Moulton Street, Cambridge, Massachusetts 02138.

ARCHITECTURAL DRAFTSMAN — Aggressive firm providing services for institutional and commercial building has need for draftsman with a minimum of two years experience. Degree preferred. Permanent position with advancement opportunities. Equal Opportunity Employer. Send resume and sample print of work along with salary requirement to Box #287, PROGRESSIVE ARCHITECTURE.

ARCHITECTURAL OR ENGINEERING—Draftsman. As an architectural or engineering draftsman, does the thought of joining a progressive architectural firm appeal to you? Look into the possibilities of joining our team which offers advancement and security to those who qualify. Write for an appointment and briefly state your background: Howard & Domenici, Architects, 404 East Fourth Street, Jamestown, New York 14701.

DRAFTSMAN—Junior & Senior. Architect-Engineer firm in modern air-conditioned office. General practice, all types of buildings. Benefits include pension plan, life insurance, medical coverage and salary continuation. Von Storch & Burkavage, 1212 South Abington Road, Clarks Summit, Pennsylvania.

INTERIOR DESIGNER-DECORATOR — Unusual opportunity for top-grade designer and decorator for mangement position in an interior design firm that works closely with national architectural firm in doing interiors of churches, schools, apartment, office and industrial buildings. Send complete resume of educational background, experience, and personal qualifications to Box #285, PROGRESSIVE ARCHITECTURE. An equal opportunity employer.

PROJECT ARCHITECT-ENGINEER — Permanent positions available in expanding AE firm for several individuals knowledgeable in industrial, commercial, and institutional building construction to assume major responsibility for complete projects, throughout all phases of design and construction. A degree in Architecture and experience as a Project Manager or Job Captain is desired. Send resume in confidence to Mr. Ralph J. Epstein, A. Epstein & Sons, Inc., 2011 W. Pershing Road, Chicago, Illinois. An equal opportunity employer.

**PROJECT ARCHITECTS—A leading architectural firm that is expanding on a planned basis needs creative design project architects. Partners of this successful firm are recognized for their professional ability. Successful candidates will have the opportunity to become an associate or partner in the foreseeable future. Position provides the opportunity to become specialized in one of the following: health, educational or commercial facilities. Experience in leading, training and developing staff members required. Replies should include personal history and work record, including architectural achievements. All replies will be handled confidentially. Our architects are aware of our firm's needs. Reply Box #288, PROGRESSIVE ARCHITECTURE.**

SPECIFICATION WRITER—Permanent position for specification writer capable of writing and supervising publication of complete specifications. Progressive engineering-architectural firm, engaged in design of schools, commercial and industrial buildings, roads and bridges. Employee benefits include paid vacation, profit-sharing and retirement plan, major medical and hospitalization plan, life insurance and tuition refund plan. Interview expenses reimbursed. Charles W. Cole & Son, Inc., 3600 E. Jefferson, South Bend, Indiana.

STRUCTURAL ENGINEER—To head engineering section architectural office. Must be capable of registering in Texas. Job consists of designing of architectural structures and coordination of all supervision. Excellent opportunity to grow with the firm, possibility future partnership. Salarv commensurate with experience. Fringe benefits. Send resume to Box #289, PROGRESSIVE ARCHITECTURE.

## SITUATIONS WANTED

ARCHITECT—Age 35, married, 14 years experience as a draftsman, job captain, project architect, designer, administrator, inspector, color selection and furniture design. Experience in all phases of architectural practice. Job desires: chief draftsman, or office manager with a future associateship or partnership possibility. Box #293, PROGRESSIVE ARCHITECTURE.

ARCHITECT—Arch. degree, AIA, Georgia registration by examination. Twelve years experience in all phases including client contact, preliminary design, working drawings, specification writing and supervision of construction. Age 36—family. Desires association with small progressive firm with possibility of partnership. Resume upon request. Box #290. PROGRESSIVE ARCHITECTURE.

ARCHITECT—California registration, presently in private practice, 17 years experience in planning, design, construction of diverse buildings, desires leadership position with progressive firm, leading to association. Age 39, married, family. Resume on request. Arthur A. Serchia, AIA, 277 Opal Canyon Drive, Duarte, California.

ENGLISH ARCHITECTURAL—Perspective artist. Royal Academy standard emigrating to U.S.A., seeks full or part-time employment. Specializes in high quality rendered drawings of both exterior and interior projects. 10 years office experience in architecture, interior design and exhibition work. Brian Jennings, 25 Shooters Road, Enfield, Middlesex, England.

GRADUATE ARCHITECT—Registered, 8 years experience, desires position with company doing work directly or indirectly with architecture where talents of architect may be utilized. Must be responsible position with professional atmosphere. Prefer location west of Mississippi River in smaller city. Age 35, married, family. Resume upon request. Box #291, PROGRESSIVE ARCHITECTURE.

REGISTERED ARCHITECT—NCARB, Bach of Arch., 15 years experience, 10 years private practice in midwest. Fully qualified all project phases. Capable designer, production manager, administrator, specification writer. Desires responsible position utilizing experience and ability with appropriate income and future potential. All locations considered. Complete resume on request. Box #292, PROGRESSIVE ARCHITECTURE.

### Advertising Rates

**Standard charge for each unit is Ten Dollars, with a maximum of 50 words. In counting words your complete address (any address) counts as five words, a box number as three words. Two units may be purchased for twenty dollars, with a maximum of 100 words. Check or money order should accompany advertisement and be mailed to Jobs & Men c/o Progressive Architecture, 430 Park Avenue, New York 22, N. Y. Insertions will be accepted not later than the 1st of the month preceding month of publication. Box number replies should be addressed as noted above with the box number placed in lower left hand corner of envelope.**

## MISCELLANEOUS

**ARCHITECTURAL & DESIGN AGENCY—Architects, design or production experience $6M to $25M. Muriel Feder maintains close contact with the entire Architectural & Design field. The "Professional Consultant" for confidential, nationwide & International coverage. Specializing in personnel ranging through all phases of the architectural office for the past 15 years. 667 Madison Ave., at 61st St., New York City. TE 8-3722.**

**CAREER BUILDERS AGENCY—Complete range of Architecture & Interior Design placement under the direction of Ruth Hirsch. Apprentices to Senior Designers and Project Architects. Professional screening and personalized service. References checked, 515 Madison Ave., New York 22, PL 2-7640.**

**CONTACT PERSONNEL AGENCY—Lillian Fox —A highly personalized and discriminating service for top-flight architects. Architectural and interior designers production and draftsmen, in all phases of architecture. Confidential interviews by appointment. 18 East 41st St., New York, N.Y. MUrray Hill 5-1674.**

**HELEN HUTCHINS PERSONNEL AGENCY—Specialist: Architecture, Industrial Design-Interior Design and Home Furnishing. Interviews by appointment. 767 Lexington Avenue, New York 21, N.Y. TE 8-3070.**



On Reader's Service Card, Circle No. 446

# DIRECTORY OF PRODUCT ADVERTISERS


**Acushnet Process Company** .......... 324
*J. G. Kasten & Co.*
**Adams Rite Manufacturing Co.** ....... 127
*Gerry Hall Promotional Services*
**Aerofin Corporation** ................ 160
*Richards & Weiss, Inc.*
**Air Products & Chemicals, Inc.** ........ 347
*Arthur Falconer Associates, Corp.*
**Albina Engine & Machine Works** ...... 122
*Elwood Enke Advertising*
**Aluminum Co. of America** .......21 thru 24
*Fuller & Smith & Ross, Inc.*
**American Cyanamid Corp., Bldg. Prod. Div.** .......................... 161
*Bresnick Company, Inc.*
**American Gas Association** ......54, 55, 360
*Ketchum, MacLeod & Grove, Inc.*
**American Laundry Machinery Industries** 255
*Northlich, Stolley, Inc.*
**American Parquet Association, Inc.** .... 25
*Brooks-Pollard Company*
**American Plywood Association** ....... 8, 9
*Cole & Weber, Inc.*
**American Saint Gobain Corp.** .....280, 281
*Turner & Feeney, Inc.*
**American Telephone & Telegraph Co.** .. 17
*N. W. Ayer & Son, Inc.*
**Ansul Company** ................. 336
*Brad Sebstad, Inc.*
**Armco Steel Corporation** ........... 302
*Marsteller, Inc.*
**Armstrong Cork Co., Ceiling Systems** ..18, 19
*Batten, Barton, Durstine & Osborn, Inc.*
**Armstrong Cork Co., Flooring Div.** 2nd Cover, 1
*Batten, Barton, Durstine & Osborn, Inc.*
**Art Metal, Inc.** .................... 288
*The Zlowe Co., Inc.*

**Bally Case & Cooler, Inc.** .........340, 341
*Beaumont, Heller & Sperling, Inc.*
**Barber-Colman Company** .........306, 307
*Howard H. Monk & Associates, Inc.*
**Bayley, William Company** ........... 123
*Odiorne Industrial Advertising, Inc.*
**Beta Industries** .................... 324
*Archer & Woodbury, Inc.*
**Bethlehem Steel Corporation** .......46, 47 283, 309
*Hazard Advertising Co., Inc.*
**The Bobrick Corporation** ............. 308
*Len Woolf Company*
**Bostwick Steel Lath Co.** ............. 320
*Ted Berndt & Associates, Inc.*
**Bradley Washfountain Company** ...... 130
*Hoffman-York, Inc.*
**Bruning, Charles Company** ....143, 144, 145
*N. W. Ayer & Son, Inc.*
**Brunswick Corporation, Burke Div.** ..... 68
*Wm. John Upjohn Associates*

**Carpenter, L. E. & Co., Inc.** .......... 308
*Harold Marshall Advertising, Inc.*
**Carrier Air Conditioning Co.** .......45, 360
*N. W. Ayer & Son, Inc.*
**Ceco Corporation** .................. 117
*Fensholt Advertising Agency, Inc.*
**Celanese Corp. of America, Devoe & Reynolds Co.** ................266, 267
*West, Weir & Bartel, Inc.*
**Chemstrand Company** ...........3rd Cover
*Doyle, Dane, Bernbach, Inc.*
**Chicago Hardware Foundry Company** .. 124
*Wilson Advertising Service*
**Cissell, W. M. Company** ............ 97
*Zimmer-McClaskey-Lewis Advertising*
**Claremont Polychemical Corporation** ... 304
*Marc Merrill Associates*
**Clark Door Company** ............... 128
*J. M. Kesslinger & Associates*
**Cockle Ventilator Company** .......... 114
*Pearson & Buffington Adv., Inc.*
**Concrete Reinforcing Steel Institute**..330, 331
*Fensholt Advertising Agency, Inc.*
**Connor Engineering Corp.** ........... 60
*William Schaller Co., Inc.*
**Consoweld Corporation** ............. 150
*Hoffman-York, Inc.*
**Consul & Mutoh, Ltd.** ............... 326
*Drew & Carr, Inc.*
**Corbin, P&F Division, Emhart Corp.** .... 303
*Wilson, Haight & Welch, Inc.*

**Da-Lite Screen Co., Inc.** ............. 110
*Reach, McClinton & Co.*
**DAP Inc.** ........................ 345
*Kircher, Helton & Collett, Inc.*
**Dayton Sure-Grip & Shore Company** .... 284
*Sabatino & Oppenheim, Inc.*
**Dover Corporation, Elevator Div.** ...... 4, 5
*Greenhaw & Rush, Inc.*
**Dow Chemical Co.** ................. 106
*MacManus, John & Adams, Inc.*
**Downs Carpet Company** ............ 304
*Fien & Schwerin, Inc.*
**duPont de Nemours, E. I. & Co., Inc., Lucite Div.** .................... 322
*Batten, Barton, Durstine & Osborn, Inc.*
**Duraflake Company** ................ 131
*Grant Thuemmel & Associates, Inc.*
**Dur-O-Wal** ................295 thru 298
*Draper Daniels, Inc.*
**Duwe Precast Concrete Products, Inc.** ....276
*Geer-Murray, Inc.*

**Eastern Products Corporation** ......... 7
*S. A. Levyne Co., Advertising*
**Eaton Yale & Towne, Inc., Yale Lock & Hardware Div.** .................. 323
*Fuller & Smith & Ross, Inc.*
**Edison Electric Institute** ..........148, 149
*Compton Advertising, Inc.*
**Eggers Plywood Company** ........... 36
*Van Handel Company*
**Eljer Plumbingware Div., Wallace-Murray Corp.** ............ 91
*Fuller & Smith & Ross, Inc.*

**Faber-Castell-Higgins, A. W. Co.** ...277, 278
*J. M. Kesslinger & Associates*
**Faries-McMeekan, Inc.** .............. 103
*Ash Advertising, Inc.*
**Featherock, Inc.** ................... 346
*Harte, Yamashita & Harte, Inc.*
**Flexicore Company, Inc.** ............. 79
*Yeck & Yeck, Inc.*
**Flintkote Company, Insulrock Div.** ..... 11
*Philip J. Meany Co.*
**Formica Corporation** ...............28, 29
*Clinton E. Frank, Inc.*

**General Conveyor, Inc., General Domes Div.** .............. 122
*Carl/Art/Clutton/Associe*
**General Electric Co.—Air Conditioning** ................286, 287
*Young & Rubicam, Inc.*
**General Electric Co., Silicone Prod. Dept.** 125
*Ross Roy, Inc.*
**General Fireproofing Company** ........ 59
*Ketchum, MacLeod & Grove, Inc.*
**Georgia Marble Company** ........... 66
*Lowe & Stevens*
**Georgia-Pacific Corporation** ........327, 328
*McCann-Erickson, Inc.*
**Georgia-Pacific Corp., Bestwal Gypsum Div.** .......................318, 319
*Waldron & MacNamee, Inc.*
**Grace, W. R. & Company** ........... 257
*Kenyon & Eckhardt, Inc.*
**Granco Steel Products Company** ...... 158
*Batz-Hodgson, Neuwoehner, Inc.*
**Grant Pulley & Hardware Corp.** ....... 132
*Bernard Cooper Advertising, Inc.*

**Hall-Mack Company** ............... 294
*Martin R. Kitten Co., Inc.*
**Hanley Company** .................. 290
*Albert P. Hill Company, Inc.*
**Harbison-Walker Refractories Company**.. 311
*Vic Maitland & Associates, Inc.*
**Hardwick & Magee Company** ......... 162
*Ernest William Greenfield, Inc.*
**Harris-Barrier, Inc.** ................. 346
*Rohr Advertising*
**Haughton Elevator Company** ......... 67
*Beeson-Reichert, Inc.*
**Haws Drinking Faucet Company** ....... 30
*Pacific Advertising Staff*
**Hillyard Chemical Company** ......... 119
*Ayres & Associates, Inc.*
**Holophane Co., Inc.** .............312, 313
*Turner & Feeney, Inc.*
**Inland Steel Products Co.** ............ 317
*Hoffman-York, Inc.*
**International Nickel Company** .....348, 349
*Marschalk Company*

**J. G. Furniture Company** ........... 263
*Design Services*
**Jens Risom Design, Inc.** ............ 10
*Harold J. Siesel Co., Inc.*
**JOFCO, Jasper Office Furniture Co.** .... 282
*Keller-Crescent Co.*
**Johns-Manville Corporation** .....26, 27, 305
*Cunningham & Walsh, Inc.*
**Johnson, S. T. Company** ............ 344
*Pacific Advertising Staff*
**Johnson Service Company** ........4th Cover
*Hoffman-York, Inc.*
**Josam Manufacturing Company** ....... 351
*Allied Advertising Agency, Inc.*
**Kaiser Auminum & Chemical Corp.**..152, 153
*Young & Rubicam, Inc.*
**Kaiser Steel Corporation** .....70 W-b, 70 W-c 70 W-i thru 70 W-l
*Young & Rubicam, Inc.*
**Kawneer Company** ..............332, 333
*Peitscher, Janda/Associates*
**Kinnear Manufacturing Company** ...... 146
*Wheeler, Kight & Gainey, Inc.*
**Knoll Associates** .................. 133
*Chirurg & Cairns, Inc.*
**Koh-I-Noor, Inc.** ................... 329
*Persons Advertising, Inc.*

**Lamicor Plastics** ................... 346
*John B. Ferguson Jr., Advertising*
**Latco Products** .................... 326
*Albert Frank-Guenther Law, Inc.*
**LCN Closers** ....................352, 353
*Alex T. Franz, Inc.*
**Lead Industries Association** .......... 112
*Edward H. Weiss & Company*
**Libbey-Owens-Ford Glass Co.** .....300, 301
*Fuller & Smith & Ross, Inc.*
**Lightolier, Inc.** .................... 35
*Daniel & Charles, Inc.*
**Limestone Products Corp. of America** ... 334
*Edward Owen & Company*
**Line Material Industries** ......101, 102, 103
*Connor-Sager Associates, Inc.*
**Lone Star Cement Corporation** ........ 93
*Hazard Advertising Co., Inc.*
**Lundstrom Laboratories** ............. 342
*Rumrill-Hoyt Company, Inc.*

**Macomber Division, Sharon Steel Corp.**.. 121
*Watts, Lee & Kenyon, Inc.*
**Master Builders Company** .....135 thru 142
*Jayme Organization, Inc.*
**Matot, D. A., Inc.** .................. 116
*Robert W. Deitz & Associates*
**McDonald Products Corporation** ....... 342
*Gelia & Wells, Inc.*
**McPhilben Lighting Company** .......16, 359
*Dunwoodie Associates, Inc.*
**Medusa Portland Cement Company** .... 157
*Will, Inc.*
**Metropolitan Furniture** .............. 20
*Hal Lawrence, Inc.*
**Miller Company** .................. 321
*Harrison House*
**Mobay Chemical Company** .......... 335
*Griswold-Eshleman Company*
**Moore, P. O., Inc.** ................. 338
*The Ullman Organization*
**Mo-Sai Institute, Inc.** ............... 72
*David W. Evans & Associates*
**Myrtle Desk Company** .............. 154
*Long, Haymes & Carr, Inc.*

**NAARCO, Inc.** ...................94, 95
*Jaqua Company*
**National Electrical Contractors Assn.** ... 316
*Henry J. Kaufman & Associates*
**National Gypsum Company** .......... 147
*Fuller & Smith & Ross, Inc.*
**New Castle Products, Inc.** .......41 thru 44
*The Biddle Company*
**Nicolet Industries, Inc.** .............. 165
*O. S. Tyson & Co., Inc.*
**Nik-O-Lok Company** ................ 126
*Sogard & McGrath*
**Norton Door Closer Div., Eaton, Yale & Towne, Inc.** ...................85, 86
*Connor-Sager Associates, Inc.*

**Omega Lighting** ................... 344
*Mercurio, Sanna Associates, Inc.*
**Otis Elevator Company** ............. 273
*Tatham-Laird & Kudner, Inc.*
**Overhead Door Corporation** ......32, 33, 34
*Glenn Advertising, Inc.*
**Owens-Corning Fiberglas Corp.**.166, 167, 261
*McCann-Erickson, Inc.*

**Pass & Seymour, Inc.** ............... 126
*Conklin, Labs & Bebee, Inc.*
**Pella Rolscreen Company** .........163, 164
*L. W. Ramsey Advertising*
**Pennsalt Chemical Corporation** ........ 289
*Aitkin-Kynett Co., Inc.*
**Pittsburgh-Corning-Foamglas** .........98, 99
*Ketchum, MacLeod & Grove, Inc.*
**Pittsburgh-Corning-Glass Block** ......69, 70
*Marsteller, Inc.*
**Pittsburgh Plate Glass Co.** ........134, 291
*Ketchum, MacLeod & Grove, Inc.*
**Plastering Institute of Greater New York** 326
*Delehanty, Kurnit & Geller, Inc.*
**Portland Cement Association** .....37 thru 40
*J. Walter Thompson Co.*

Potter-Roemer, Inc. . . . . . . . . . . . . . . . . 350
*Reeds & Farris*
Powers Regulator Company . . . . . . . . . . 310
*Bowman-Winter Advertising*
Pratt & Lambert, Inc. . . . . . . . . . . . . . . . 61
*Barber & Drullard, Inc.*
Prescon Corporation . . . . . . . . . . . . . . . . 115
*Brown & Koby*
Prestressed Concrete Institute . . . . . . . . . 53
*Scott & Scott Advertising, Inc.*
Progressive Architecture . . . . . . . . . . . . . 129
Progress Manufacturing Company . . . . . 156
*Auerbach & Becker, Inc.*

Reinhold Publishing Corp. . . . 70 W-d, 70 W-f, 70 W-h, 116, 314, 350
Republic Steel Corporation . . . . . . . . 292, 293
*Meldrum & Fewsmith, Inc.*
Revere Electric Manufacturing Co. . . . . . 339
*Allan Marin & Associates, Inc.*
Rigidized Metals Corporation . . . . . . . . . 81
*Russell Baker, Inc.*
Robertson, H. H. Company . . . . . . . . . . . 343
*Bond & Starr, Inc.*
Rohm and Haas Company . . . . . . . . . . . 155
*Arndt, Preston, Chapin, Lamb & Keen, Inc.*
Ruberoid Company . . . . . . . . . . . . . . . . . 159
*Kastor, Foote, Hilton & Atherton, Inc.*
Russwin Division, Emhart Corporation . . 14, 15
*Horton, Church & Goff, Inc.*

Sargent & Company . . . . . . . . . . . . . . . . 151
*Hepler & Gibney, Inc.*
Schokbeton Products Corp. . . . . . . . . . . . 279
*Chuck Weber Advertising, Inc.*
Sisalkraft Div./St. Regis Paper Corp. . . 82, 83
*Reynolds & Foster, Inc.*
Slater Electric, Inc. . . . . . . . . . . . . . . . . 299
*Kane, Light, Gladney, Inc.*
Sloan Valve Company . . . . . . . . . . . . . . 259
*Reincke, Meyer & Finn, Inc.*
Smith, Elwin G. & Co., Inc. . . . . . . . . . . 325
*Dan Frye Advertising, Inc.*
Soss Manufacturing Company . . . . . . . . 342
*Harry H. Goldberg, Jr. Adv., Inc.*
Southern California Edison Company 70 W-a, 70 W-e
*Young & Rubicam, Inc.*
Southern California & South. Count. Gas Co. . . . . . . . . . . . . . . . . . . . . . 70 W-g
*McCann-Erickson, Inc.*
Southern Pine Association . . . . . . . . . . . 31
*Knox Reeves-Fitzgerald Advertising*
Sta-Crete, Inc. . . . . . . . . . . . . . . . . . . . 126
Stanley Works, Door Opening Equipment . . . . . . . . . . . . . . . . . . 110, 111
*Chirurg & Cairns, Inc.*
Stanley Works, Hardware Div. . . . . . . . . 315
*Batten, Barton, Durstine & Osborn, Inc.*
Stauffer Chemical Co., Plastics Div. . . 274, 275
*Clyne Maxon, Inc.*
Steel Joist Institute . . . . . . . . . . . . . . . . 337
*Batz-Hodgson-Neuwoehner, Inc.*
Stephens-Adamson Mfg. Co., Speedwalk Div. . . . . . . . . . . . . . . . . . . . . . . . . . 109
*Connor-Sager Associates, Inc.*
Sturgis Company . . . . . . . . . . . . . . . . . . 162
*Ketchum, MacLeod & Grove, Inc.*
Superior Concrete Accessories, Inc. . . . . . 128
*Admakers, Inc.*
Symons Manufacturing Company . . . . . . 16
*Evans Advertising*

Templar, Inc. . . . . . . . . . . . . . . . . . . . . 127
*Gordon Advertising Agency*
Thermal Research & Engineering . . . . . . . 304
*William Jenkins Adv.*
Thermoproof Glass Co., Subs Shatterproof Glass Corp. . . . . . . . . . . . . . . . . . . . . 124
*Film Associates of Michigan, Inc.*
Thiokol Chemical Corporation . . . . . . . . . 13
*MacManus, John & Adams, Inc.*
Tile Council of America, Inc. . . . . . . . . . 285
*Codella, Duffus & Baker, Inc.*
Trend Contract . . . . . . . . . . . . . . . . . . . . 58
*Nadler & Larimer, Inc.*
Trinity White, General Portland Cement Co. . . . . . . . . . . . . . . . . . . . . 168
*Alex T. Franz, Inc.*
Troy Sunshade Company . . . . . . . . . . . . 48
*Parker Advertising Co.*

Universal Atlas Cement Co., Div. U.S. Steel Corp. . . . . . . . . . . . . . . . . . . . . . . 357
*Batten, Barton, Durstine & Osborn, Inc.*
U.S. Plywood Corporation . . . . . . 49 thru 52
*Kenyon & Eckhardt, Inc.*
U.S. Steel Corporation . . . . . 62, 269 thru 272
*Batten, Barton, Durstine & Osborn, Inc.*

V & E Manufacturing Company . . . . . . . 120
*Advertising Direction Bill Mitchel*
Vogel-Peterson Company . . . . . . . . . . . . 12
*Ross Llewellyn, Inc.*

Wakefield Lighting Div., Wakefield Corp., ITT . . . . . . . . . . . . . . . . . . . . . . . . . . . . 88
*Jay H. Maish Company*
Wallace-Murray Corp., Eljer Plumbingware Div. . . . . . . . . . . . . . . . . . . . . . . . . . . 91
*Fuller & Smith & Ross, Inc.*
Webster Electric Co. . . . . . . . . . . . . . . . 118
*Franklin/Mautner/Advertising*
Western Wood Products Association 56, 57, 314
*McCann-Erickson, Inc.*
Wheeling Corrugating Company . . . 354, 355
*Gardner Advertising Company, Inc.*
Woodall Industries, Inc.-Conolite Div. . . . 128
*Connor-Sager Associates, Inc.*
Wood Conversion Company . . . . . . 63, 64, 65
*McCann-Erickson, Inc.*
Wooster Products Inc. . . . . . . . . . . . . . . 314
*McDaniel-Fisher & Spelman, Inc.*

Yasutomo & Company . . . . . . . . . . . . . . 127
*Thomas K Yamagata Advertising Associates*

Zero Weather Stripping Co., Inc. . . . . . . 268
*Harold Marshall Advertising Co.*
Zonolite Division, W. R. Grace & Co. 264, 265
*Fuller & Smith & Ross, Inc.*

## ADVERTISING SALES OFFICES

### Progressive Architecture

**New York Office**

430 Park Avenue, New York, N. Y. 10022
MUrray Hill 8-8600 Area Code 212

**Robert L. Bassinette** — Eastern Regional Sales Manager

**Harrington A. Rose** — District Manager
**Donald W. Thompson** — District Manager

**Pittsburgh Office**

601 Grant St., Pittsburgh, Pa. 15219
ATlantic 1-9421 Area Code 412

**Albert E. McClimans** — District Manager

**Chicago Office**

10 S. LaSalle St., Chicago, Ill. 60603
RAndolph 6-1282 Area Code 312

**Wolcott H. Johnson** — Midwest Regional Sales Manager
**Michael J. Hanley** — District Manager

**Detroit Office**

Telephone: Enterprise 6704
**Michael J. Hanley** — District Manager

### Reinhold Publishing Corporation

**Cleveland Office**

1717 E. 9th St., Cleveland, Ohio 44114
PRospect 1-4011-12-13 Area Code 216

**John F. Kelly** — District Manager

**San Francisco Office**

**Jobson, Jordan, Harrison & Schulz, Inc.**
57 Post St., San Francisco, Calif. 94104
392-6794 Area Code 415

**Cyril B. Jobson, Charles S. Harrison**

**Los Angeles Office**

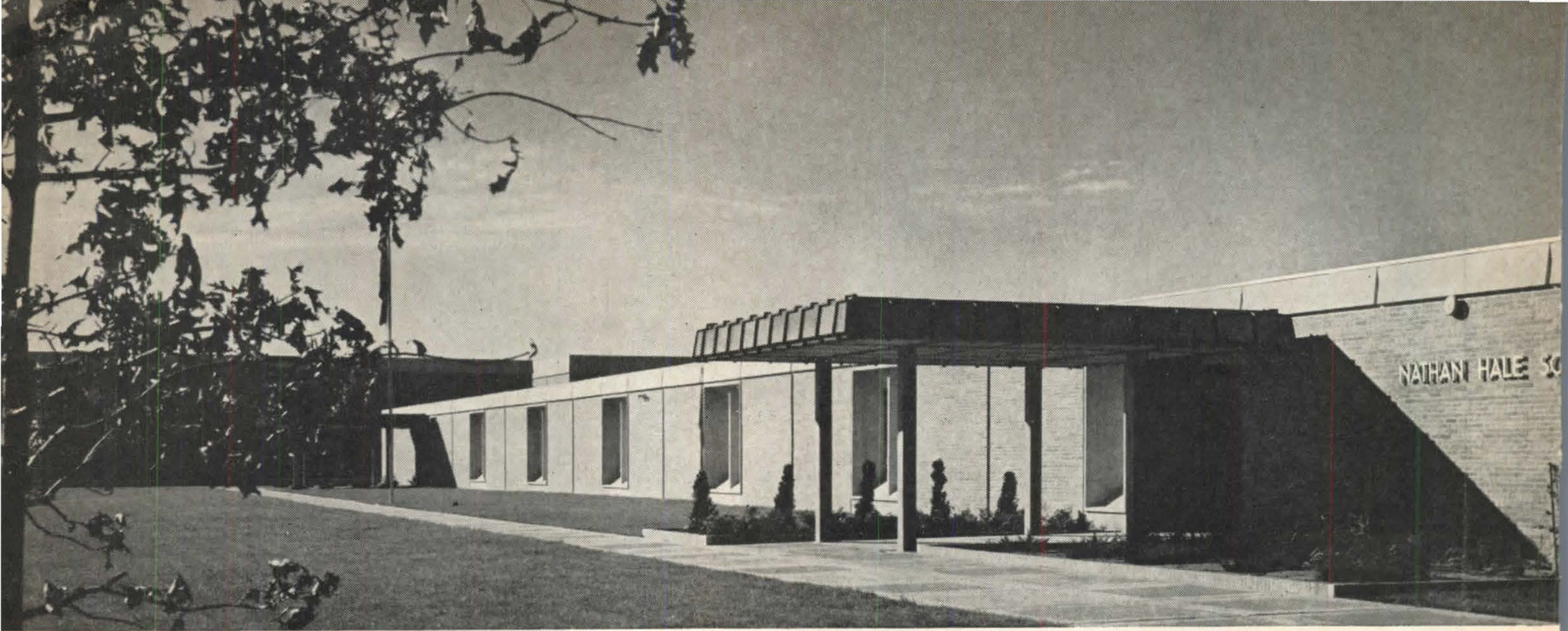
**Jobson, Jordan, Harrison & Schulz, Inc.**
1901 W. 8th St., Los Angeles, Calif. 90057
483-8530 Area Code 213

**Peter Schulz, Kenneth E. Jordan**

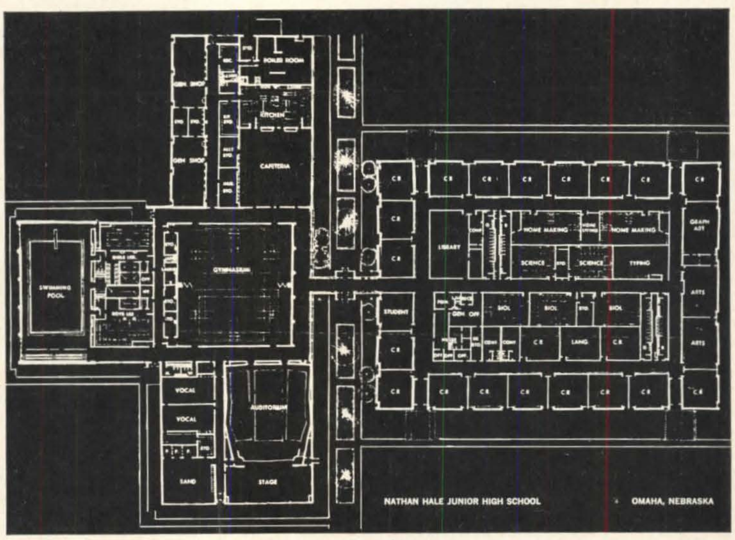
**Atlanta Office**

**Robert L. Watkins Associates**
505-805 Peachtree Bldg., Atlanta, Ga. 30308
TRinity 4-6427 Area Code 404

**Robert L. Watkins, Harmon L. Proctor**




# Gas plus Carrier absorption cooling simplifies the complex climate problems of this compact school. Economically.




*Architects / Engineers:*
*Leo A. Daly Co., Omaha, Neb.*
*General Contractor:*
*Shelton & Sons, Omaha, Neb.*
*Mechanical Contractor:*
*Natkin & Co., Omaha, Neb.*
*Superintendent of Schools:*
*Dr. Paul A. Miller*
*Principal:*
*Wendell Belieu*

The new Nathan Hale Junior High School in Omaha specified Gas-powered Carrier air conditioning to meet unique climate control problems of modern schools.

The cooling source is a 260-ton-capacity Carrier absorption machine, powered by the same Gas boilers that heat the school. Perimeter classrooms are air conditioned by Carrier *Classroom Weathermaster®* units. Interior rooms have units with hot water reheat coils. And auditorium, cafeteria and shops are served by multi-zone air conditioning units.

This kind of flexibility isn't expensive, either. The cost of Carrier and Gas climate control is low when you build, low over the long term. Get more information. Call your local Gas Company Sales Engineer. Or write: Carrier Air Conditioning Co., Syracuse, N.Y. 13201. AMERICAN GAS ASSOCIATION, INC.

**For heating and cooling . . . Gas makes the big difference**