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# Northwest Architect

Official Publication of the Minnesota Society of Architects

VOLUME XXXV NUMBER 3 Mar.-Apr. 1971

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# Area Notes

## Architectural News from Five States

### PEOPLE . . .

New and changed architectural firms were in recent news. **Wayne R. Winsor**, former president of Ellerbe Architects, St. Paul, and **Richard T. Faricy**, former head of Cerny Associates' St. Paul office, formed a new firm under the name of Winsor-Faricy Architects. Officed in Metro Square, St. Paul, the partners are both University of Minnesota graduates. Winsor is registered in 30 states and Faricy in six. . . . Realignment of administrative responsibilities in the Milwaukee firm of Schutte, Mochon, Inc., saw **L. J. Schutte** become chairman of the board, **C. Mochon** become president, **R. D. Hackworthy**, secretary and **F. A. Schutte** treasurer. Vice-pres. **R. Juerisson** is new in the firm. Schutte, Mochon also announced formation of a new Florida corporation with **Robert Howard**, New Smyrna Beach, Fla., to work on a Daytona Beach condominium. . . . In Spooner, Wis., **G. W. Kortness**, architect, and **R. W. Ripley**, civil engineer, have set up a partnership.

**Irvin C. Holman**, partner in the Fargo firm of Clark and Holman, has been appointed to GSA's Region 6 public advisory panel on architectural services. A graduate of N. D. State University, he will serve a two-year term on the panel. . . . **Bob Ross**, 1969 graduate of the Iowa State University, has joined the staff of Black Hills National Forest as a landscape architect, with headquarters in Custer, S. D.

Named a director of the Foundation for Environmental Computer/Designs, Inc., a non-profit organization, was **James A. Kellelt**, vice-president and treasurer of St. Paul's Team 70 architectural firm. . . . **E. A. Jyring** of Aguar, Jyring, Whiteman, Moser, Inc., Hibbing and Duluth, Minn., is an active member of AIA's urban planning and design committee, which seeks to "direct the architectural profession to respond imaginatively to the environmental design needs of society."

The Northeastern AIA Chapter, which takes in the Arrowhead Area of Minnesota, recently honored **Arvid Gross** for outstanding craftsmanship in the construction industry. Gross, a plumber, received an award plaque from chapter **Pres. William Moser** . . . 1971 president of the Southeast Section of the Wisconsin AIA Chapter is **Richard J. Diedrich**, a principal in the Milwaukee firm of Miller, Waltz, Diedrich Architects and Associates.

Name change has been announced by the St. Cloud, Minn., firm of Jackson Associates Inc., Architects and Engineers; the name being **Wemliner-Remely and Associates Inc.** The firm also has moved into new offices in the remodeled Guarantee Bank Bldg. . . . **Gene Murphy** has been named an associate in the firm of Ward Whitwam in Adrian, Minn. He has been with the firm four years. . . . Vice-president in charge of design for Carl W. Schubert and Associates, LaCrosse, Wis., is newly appointed **William L. Schroeder**. At the same time the name of the firm was changed to Schubert, Schroeder and Associates. . . . **Donald R. Barness** has become a partner in Anderson & Wade, architectural firm in Minot, N. D. At the same time it was announced the firm name now is Anderson, Wade and Barness, Architects and Planners.

**David Wagner**, who has been on the staff of the St. Paul firm of Bergstedt, Wahlberg, Bergquist Associates, recently was named an associate of the company. He joined the firm in 1968 and has served as project architect on a number of its projects. . . . Heckner, Schroeder, Roslansky and Associates of LaCrosse, Wis., has added **Peter G. Klynstra** to its design staff. An architectural graduate of the University of Illinois, Klynstra is working toward his master's degree in landscape architecture at the University of Wisconsin.

Promoted in the commercial-educational division of Ellerbe Architects, St. Paul, were **Terence R. Marolt** to division manager, **Roger A. Fixsen** to assistant manager and **Robert L. Plumley** to production co-ordinator. Meantime, **Earl F. Beddow**, director and vice-president for architectural and engineering services, retired after 26 years with Ellerbe. He will be a part-time consultant to the firm.

Among 26 firms hit by the Miracle Mile Shopping Center fire in Rochester, Minn., recently was the architectural office of **Weichselbaum and Associates**. . . . Speaking up for architecture at a recent meeting of a Hudson, Wis., service club was **Richard Evjen**, member of the Minneapolis AIA Chapter. He gave members an "armchair assessment of Hudson" and its architecture. . . . And Architect **Ted Bumiller** presented a film to an audience in Randolph, Wis., on "Travel and Adventure."

Death has taken from among those in the architectural field **Richard C. Reinecke**, one of the original partners in Ellerbe Architects, **Paul Nystrom**, recently retired partner in the Madison,

Wis., firm of Law, Law, Potter and Nystrom, and **Ernest H. Schmidt**, whose firm was the Ernest H. Schmidt Co., in Mankato, Minn.

### . . . AND PROJECTS

#### MINNESOTA

A HUD honor award for urban design has been announced for the **Jonathan** new town **Project** southwest of the Twin Cities. Also the recipient of an award was Metro 85, a project of the city of Minneapolis. Both awards were presented during the convention in Minneapolis of the American Institute of Planners. . . . **Patch, Erickson, Madson & Hanson** of Minneapolis have been selected by the Scott County Board of commissioners to design the country's new office building in Shakopee, Minn. . . . Crowded facilities in the Proctor high school have led the school board there to hire **Melander, Fugelso and Associates** of Duluth to do preliminary planning for a new structure. The new school would be built on a 40-acre site already owned by the city. . . .

Plans for a 50-unit low rent housing project are being prepared by **Miller, Melby and Hanson, Architects**, Minneapolis, for the Canby Housing Authority. . . . **Cerny Associates**, Minneapolis-St. Paul, are working on a 130-unit structure to provide housing for the elderly in Albert Lea. The firm is working with the Albert Lea Housing and Redevelopment Authority. . . . A special attention attracting design was evolved by **William E. Gage and Associates** of Osseo for the dental office building of Dr. Paul Bischel in Cannon Falls. . . . **Liebenberg, Kaplan, Glotter and Associates** of Minneapolis have designed the first of several metropolitan area theaters, each of which will contain four separate movie units.

Although a trucking company's buildings may put relative restrictions on the design possibilities, **Weichselbaum and Associates** of Rochester achieved attractive results for the new structures recently occupied by International Transport Co. The buildings were an office building and a safety lane structure, which replace those destroyed by fire. . . . The home and office combination designed by **Warren Kane** of Austin for his own use was a feature of a recent home tour in that city.

#### IOWA

The Iowa AIA Chapter reached over into Wisconsin to give a merit award to **Durrant, Deininger, Dommer, Kramer and Gordon, Architects**, Watertown, Wis., for their Stephen Hempstead High School in Dubuque, Iowa.

#### WISCONSIN

Appreciated gesture on the part of **Rasche, Schroeder, Holt and Associates**, Milwaukee architects, was their drawing up of the preliminary plans for a proposed ranch for physically and mentally retarded young adults without charge to the sponsors of the project. The Ranch Development Fund is raising funds for the project, which includes many features to expand the life experiences of the handicapped who would be there. The Ranch is in Menomonee Falls. . . . Another firm's gesture took the unique form of a specially designed and made-of-wood clock with four faces. The clock was presented by **Steinmann Architects** of Monticello to the Turner Hall Club, for which the architects did recent design work.

A new school building and additions to three others are "in the works" for Tomah, with the additions now being planned by **Krueger, Schuter and Associates** of Madison. . . . The American School and University Magazine selected the design of the science center at Nicolle College and Technical Institute in Rhinelander for exhibit at a national educational conference. The building was designed by **Schutte, Mochon, Inc.**, Milwaukee.

A pedestrian mall in the main shopping area of Oshkosh is one of the several features of a downtown development plan being considered by the city's chamber of commerce. Planning of the development has been handled by Architects **Leonard Reinke and Robert Yarbro**. . . . As the third construction industry firm to be interviewed about development of the business area of LaCrosse, the Milwaukee firm of **Miller, Waltz, Diedrich, Architects and Associates**, proposed an enclosed mall about which adjoining properties would be designed.

Approval has been announced for the city of Menomonie to construct a 60-unit low rent housing project for the elderly. The city's housing authority people have been working on the plans with **Hackner, Schroeder, Roslansky and Associates**, architectural firm based in LaCrosse. . . . **Charles A. Rice** is the architect for a project now in the advanced planning stages to build an apartment development sponsored by the Kenosha local of the United Auto Workers. The development, known locally as a

(Continued on Page 127)

**Structural steel** goes round and round  
and where it stops is the remarkable  
**Blue Cross Building in Egan Township**



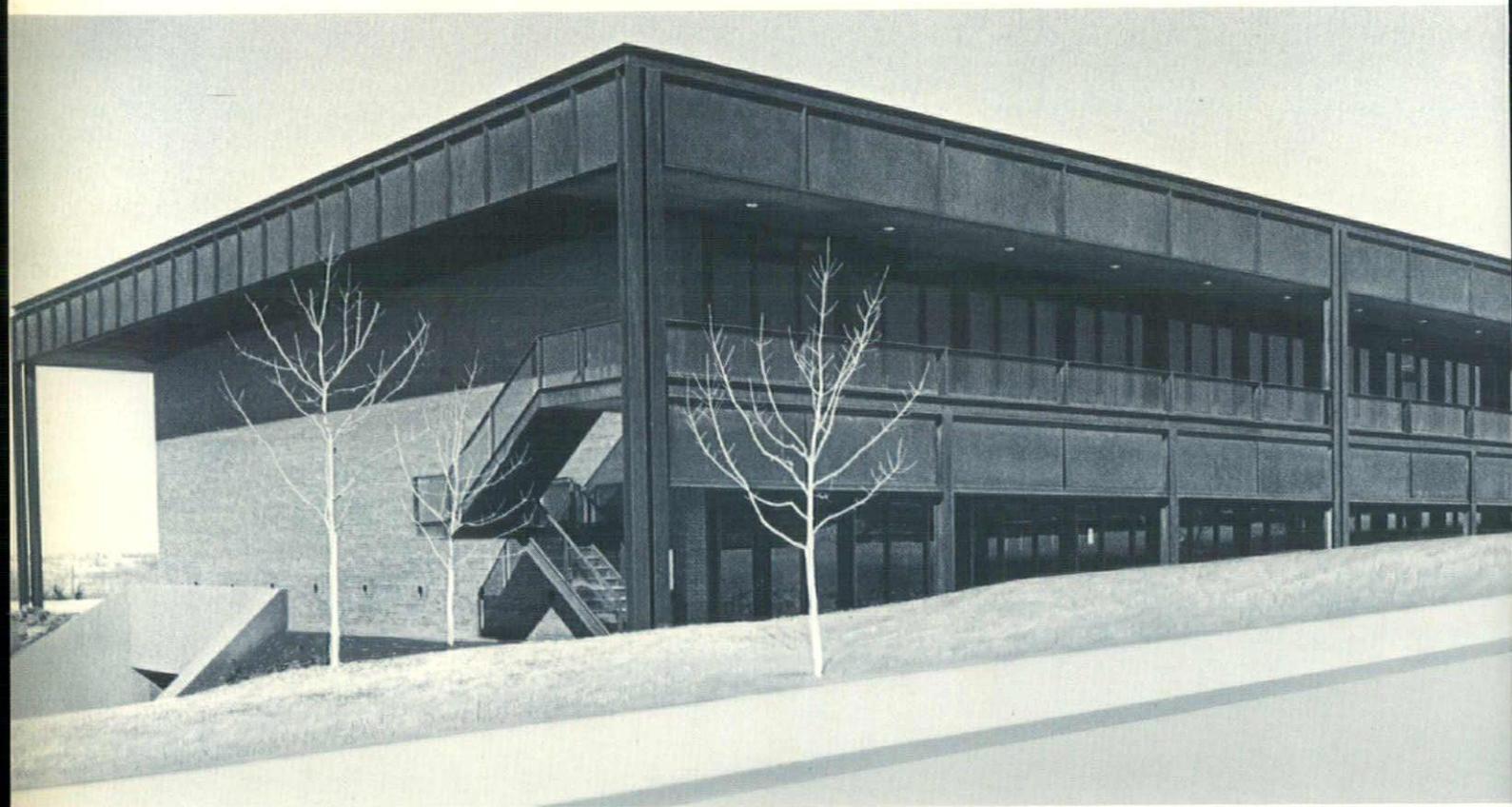
Architects-The Cerny Associates, Inc. • Engineers-The Cerny Associates, Inc.,  
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# Blue Cross chose structural steel for distinctive design, minimum support, and weathering beauty.

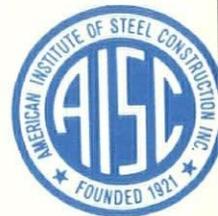


"The Blue Cross building represents the desire of the client to create an ideal atmosphere for employees in a suburban location, keeping in mind the view and the park-like setting. The environment that is available to everyone throughout the building, and the openness of the building reflects large areas of glass and minimum support. The color of the weathering steel enhances the landscape."

Robert Cerny FAIA.  
The Cerny Associates, Inc.  
Architects



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# Concrete in Age of Aquarius

By Donald W. Hassenstab, Executive Director  
Minnesota Society of Architects

Our much talked about Age of Aquarius has a concrete foundation! The solidity of this building material has always made it of prime importance but in recent times development of new kinds and new techniques has given it wings to soar above the foundations it once was confined to.

In the burgeoning of the use of concrete the architect has had an important role. He has kept in the forefront by availing himself of the research results coming from a large number of groups working in this area and has used these results to give his designs new and varied identities, with concrete as the material.

Concrete as a material has influenced design in many ways. At first its influence led to a heaviness inherent in its structure and its strength. However, design can influence materials and imaginative architects have pushed toward growth of concrete's possibilities through including unusual uses of it in their designs. Manufacturers and others in the supply area have then aided the designer in achieving what he wanted through research to expand the use-horizons of this material.

This changing of the role of the once "heavy" material to give it great variety reflects an important change in the practice of the professions and trades which make up the field of construction. It reflects the increasing use of the "team" in architecture, the team of specialists in fields of design, engineering, specification, materials supply, contracting and so on. Backing the teams of specialists, who

put into actual structures the idea-coupled-with-material which comes from those in architecture and its related areas of activity, are the materials research people. Seldom recognized as active participants, they nevertheless are vital in giving the designer his tools and his palette of materials and in keeping producing industries up with the demands of our Age of Concrete.

Concrete today is not just a mixture of cement and aggregates. Concrete today is a science by itself. Its production calls upon many specialists. Its production has led to new sub-industries within the huge construction industry—the ready-mix companies, the firms which specialize in evolving the complicated forms needed to place concrete into buildings and beyond that the companies which develop new kinds of forms and form materials. All this is part of an evolution which promises to go on for a long time with at present unimagined changes in basic concrete.

The ingredients of concrete are among our most extensive and readily available resources. In this age when we are frightened by reports of many natural resources' being depleted it is heartening to know that the resources which go into concrete, which goes into our best buildings, which in turn, go into helping make our lives richer and our economy better, are still abundant.

So it is a good thing that this issue of Northwest Architect is devoted to considerable extent to concrete in a lead article, with examples of this material's use.



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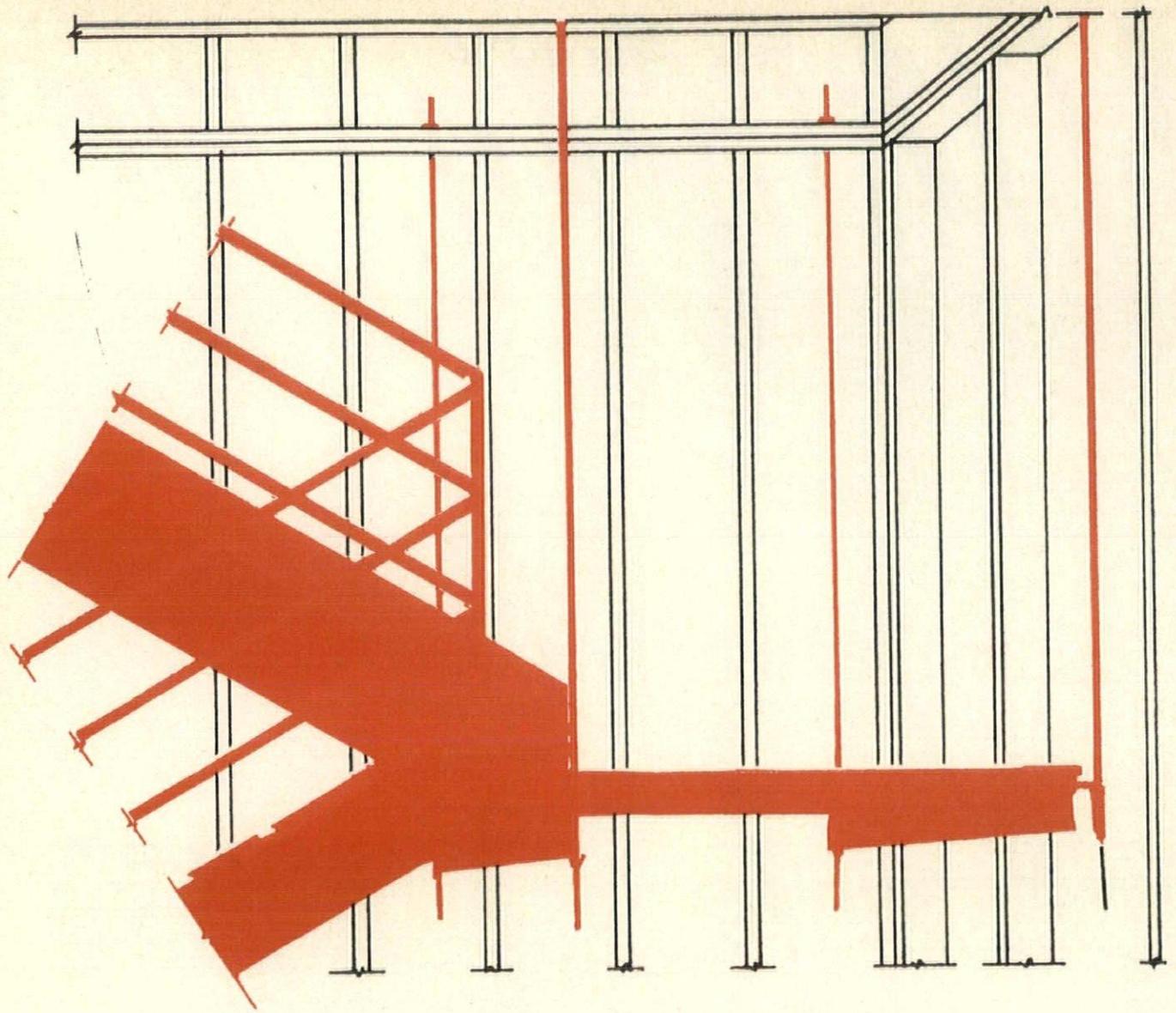


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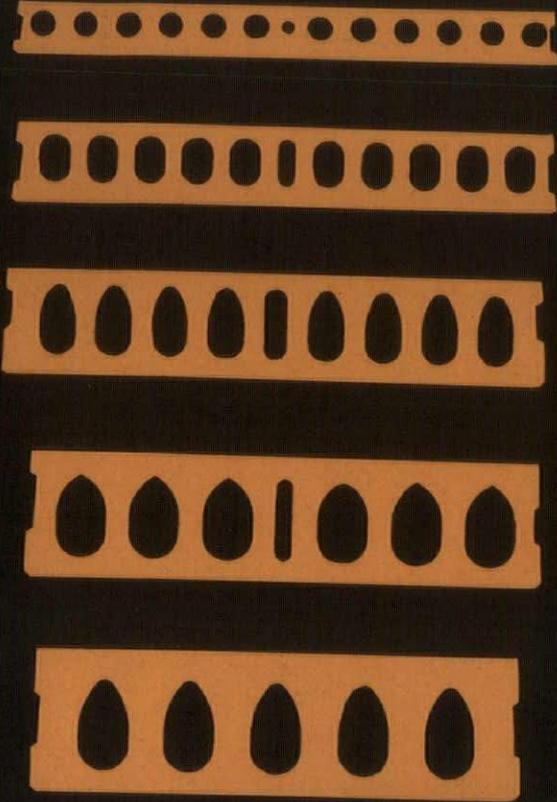
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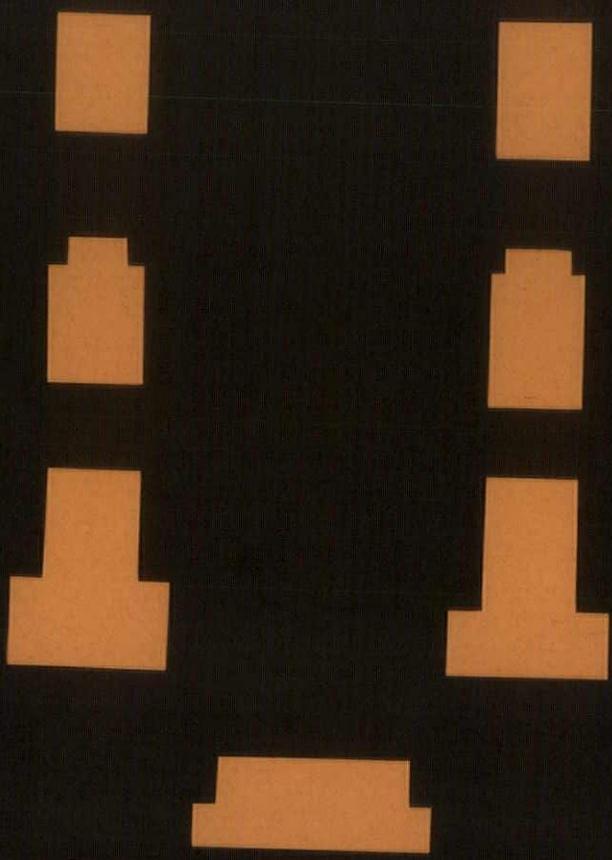
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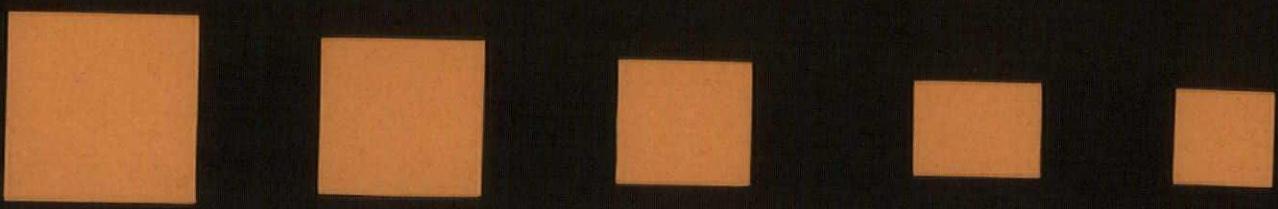
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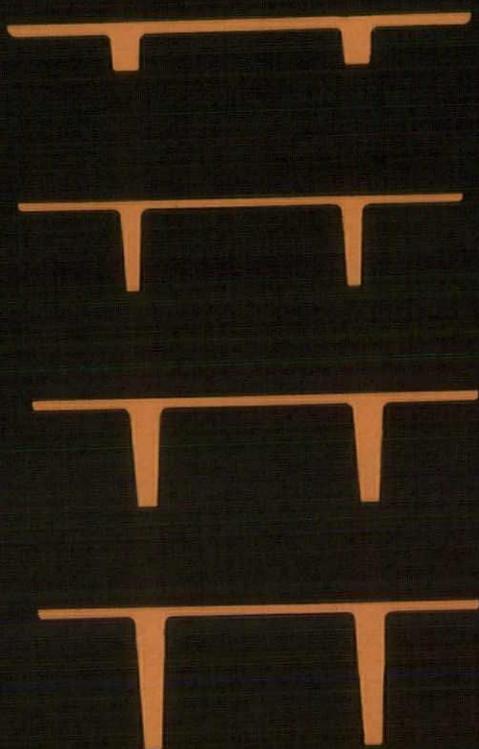
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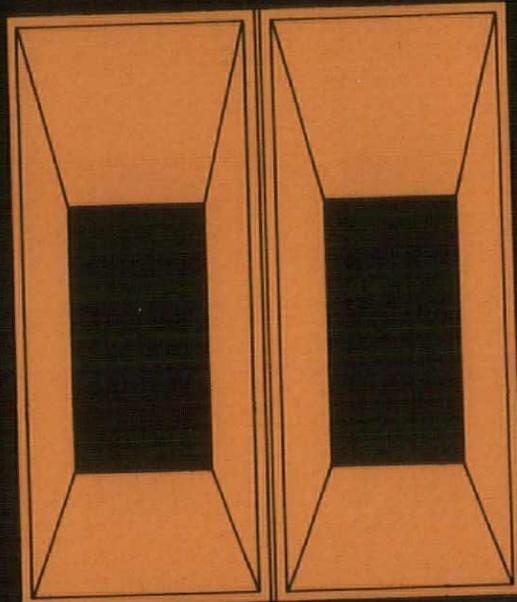
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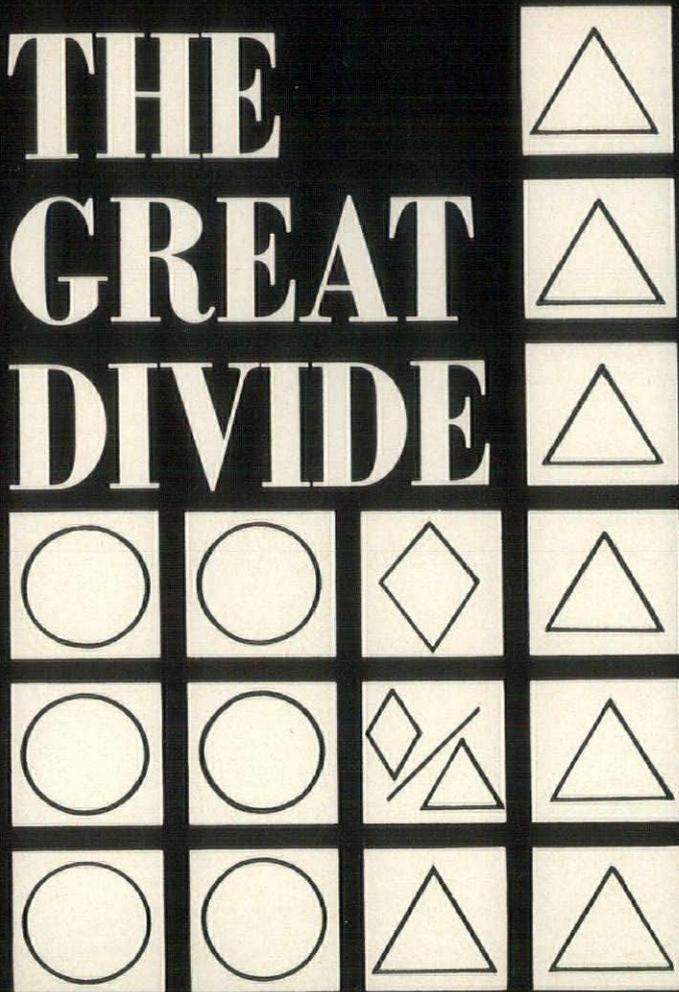
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# THE GREAT DIVIDE



The Great Divide separates prime contractor bidding in all construction. Mechanical, Electrical, and General Construction contracts are let separately, and what makes the division great is mainly a matter of arithmetic.

Separate competitive bidding reduces total construction costs by a significant amount. That fact has been demonstrated so often that separate bidding on public construction is a requirement in many states, and it's equally sound procedure in private construction. And since the mechanical portion can account for as much as 40% of the total, the need for cost efficiency in the installation, operation and maintenance of the mechanical system is obvious.

Beyond cost efficiency, separate bidding offers the additional advantage of selection, based on the mechanical contractor's reputation and capability, qualities best known before construction begins.

All things considered, to get the right answer, you divide. Let contracts for prime construction components *separately*.



**PIPING INDUSTRY  
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# Architectural and Structural Concrete

By T. A. Hoffmeyer, P.E.

Senior Engineer, University of Minnesota

## Introduction

As an introduction I wish to point out that, through the efforts of the Portland Cement Association, the National Research Council, the Canadian Standards Association, the American Society of Testing and Materials, the American Concrete Institute and other technical societies, concrete has become the leading international material of construction.

**Most concrete work done today is acceptable. However, much of it could be done better. To produce quality concrete requires the know-how and teamwork of the architect, the engineer, the inspector, the concrete supplier and the contractor.**

Technical knowledge is being accumulated much faster than practical knowledge and both are essential to making high quality concrete.

We often find that regardless of how good the plans and specifications may be or how competent the inspector may be, it is difficult to obtain high quality concrete work without the full co-operation of the contractor, his construction superintendent and foreman. Most men naturally want to do good work and when they understand the problems and what is required to produce a good product they are more willing to co-operate with the architect-engineer and the inspectors in following the requirements of the specifications.

We therefore find that on jobs where the contractor's construction superintendent, his foreman and crew have the proper know-how and fully understand the basic fundamentals of producing high quality concrete work, we generally get excellent results.

Poor workmanship produces inferior results which are costly to the contractor and unsatisfactory to the architect and the owner. This is especially true in concrete work. Concrete patching is expensive, unsightly and often not acceptable to the architect-engineer or owner. Concrete failures, regardless how minor, are always undesirable and sometimes dangerous and very costly. **There is nothing worse in the building business than a bad concrete job, which often receives damaging publicity.**

**Pre-job experimenting and job training are important.** After concreting operations are started there is seldom time for experimenting and training. Where sample architectural concrete panels are required or when doubt exists as to the best way to form and cast special sections, a full size mock-up section should be made. Such procedure provides the contractor an opportunity to pre-check the ability of his foreman and workmen and give them actual job training and experience that will pay big dividends when construction work is underway.

**Formwork is a major item to be considered.** The ultimate appearance of an architectural or structural concrete project depends to a very great extent on the quality of the formwork. The cost of formwork amounts to more than one-half the total cost of concrete used for building construction in the United States. Directing and supervising the design and construction of formwork for a structural or architectural concrete project is, therefore, a most important function of the contractor. He should fully recognize the influence that formwork has on the ultimate appearance of a concrete structure. He must understand the fundamentals of good forming practices and be qualified to develop plans to build, handle and remove formwork economically.

During the pre-planning of a concrete project, the contractor and his superintendent should work with the architect-engineer, the testing laboratory and the concrete supplier to develop designs best suited for concreting the various features of the structure. Several mix designs may be needed, including separate designs for the footings, walls, structural members, floor slabs and special mixes for architectural concrete.

On large projects pre-scheduling of concrete deliveries should be worked out with the supplier. When special mixes are required it is especially important to make certain the ready mix supplier is prepared to make deliveries when needed. Planning, preparation and supervision of placing, protecting and curing must be given full attention.

The finishing and care of concrete floors is a responsibility of the contractor's superintendent that is

too often delegated to the labor foreman and cement finishers, who do not always understand the techniques required to produce floors of dependable quality and durability.

**The contractor should co-operate fully with the architect-engineer to work out a reliable concrete testing program** and follow through to make certain proper procedures are set up to cast and care for job test specimens until delivered to the laboratory. Unreliable test reports can become very exasperating to all persons concerned with strength requirements.

The many things to be considered in planning and directing a concrete project involve much more than can be covered within the scope of this paper. In the remaining space available I shall briefly review the following topics—(1) formwork, (2) benefits and placeability of low slump air entrained concrete, (3) compaction by internal hi-cycle vibration, (4) delivery and placing schedules, (5) supervising concrete floor construction and (6) the preparation and care of concrete test cylinders.

### Formwork

The quality and appearance of cast-in-place concrete depends to a very great extent on the quality of the formwork. Poor forming practice invariably increases the cost of patching, chipping and rubbing which is too often required to correct for poor alignment, bulges and crack bleeding.

To make forms safe and strong enough to maintain alignment requires sound engineering design and good judgment. All conditions of the job must

be considered, including rate and height of pours, vibration, impact and live loads. Unit stresses of the forming materials must not be exceeded. Proper and dependable bearing for shores and braces must be provided. Spans between supports or ties must be limited.

**Uncontrolled cracking caused by drying shrinkage and temperature change in exposed concrete slabs and walls is a very undesirable and unsightly feature found in many concrete structures.** The contractor should assist the architect-engineer to prevent such cracking as much as possible by providing adequate control joints, also by limiting and check-boarding concrete placement. This is a matter that should be given special attention in designing the forms and in scheduling the limits of concrete to be placed in any one day. **The detailing and location of all construction joints and/or control joints should be worked out with the architect-engineer during the original planning and design of the formwork.** By doing this the finished appearance of the structure can generally be greatly improved.

Construction and control joints in walls can be made to appear as panel lines which are often desirable as architectural features. This can be done by providing removable wood strips on the inside of the form midway over the joint. The joint or crack can then be hidden and sealed by filling the joint partially or fully with caulking compound.

**Practically watertight forms are a must for exposed and architectural concrete surfaces.** They must be engineered and designed to withstand the



Parking ramp for St. Barnabas and Swedish Hospitals, Minneapolis—Close Associates and Horty, Elving & Associates, Architects.

liquid pressures of fresh concrete, when the concrete is consolidated by high cycle internal vibrators without crack bleeding, sagging or deflecting beyond allowable tolerances. **Bleeding** at corners of columns and beams or between boards and ply panels, where mortar is lost through cracks, **produces unsightly surface defects which are practically impossible to correct when textured surfaces are desired.**

Considering the many problems involved in molding the shape and appearance of a concrete structure, the design, the selection of material and the construction of formwork become complex subjects. **One good example of this is the profound influence that forms may have on the color of formed surfaces. This is especially true when board forms are used.** If the density or moisture content is not uniform in the form boards, the concrete surface formed with dense damp or green boards will be darker than concrete formed by dry boards. This fact has been conclusively demonstrated.

The ACI has published a handbook titled "Formwork for Concrete" by M. K. Hurd. Incorporated in this book is the report of ACI Committee 622 titled "Recommended Practice for Concrete Formwork." This book contains information of value to anyone concerned with this subject.

#### **Benefits and Placeability of Low Slump Air Entrained Concrete**

**The added quality and economy that can be gained by using entrained air, maximum size aggregates, with minimum water content, are significant factors that should be considered in designing concrete mixes for any construction project.**

Workability must be adequate but never more than required for proper compaction when full use is made of modern vibration equipment. **Excess workability should be avoided in favor of economy and added quality.** It is unfortunate that on some projects, wet high slump mixes continue to be popular with concrete crews and some foremen. They should be shown that a better job can be done by using low slump, air entrained concrete containing less sand and water and larger aggregate, when properly placed and adequately vibrated.

**Low slump concrete minimizes segregation.** It can be consolidated better by more vigorous vibration without fear of segregation. It can be vibrated for longer periods without fear of over-vibration.

**Air entrainment suppresses bleeding.** Formed surfaces can be made better using low slump air entrained concrete because it can be vibrated more intently with less fear of crack bleeding.

The pumpability of concrete is much improved by the reduced segregation and the lubricating effect of entrained air. It has become a must in practically all concrete pumping operations or when transporting concrete long distances without agitation.

**The workability of well graded 3" slump air entrained concrete is ample for average structural and architectural concrete jobs.**

For large or important jobs where there is doubt the construction superintendent, his foreman and concrete crew have had experience in placing low slump concrete, trial batches should be placed in full size mock-up sections.

It will be found that results depend more on supervision and **adequate workmanship in placing and thoroughness of vibration** than on surplus workability of the mix. **In fact, it will be learned that slabs and heavy structural members can be satisfactorily cast using concrete with slumps of 2" and less when properly designed and when adequately vibrated.**  
**Compaction by Internal Hi-Cycle Vibration**

The selection of vibrators must be thoroughly considered **as regards to size, type, and number required,** including standby units. One replacement vibrator should be on hand at all times for each working vibrator.

The effectiveness of a vibrator depends on its speed, amplitude of vibration and weight. High speed immersion type vibrators operating at 10 to 12 thousand r.p.m. will consolidate concrete much faster and better than one operating at 3600 r.p.m. In actual test we found that one c.y. of 2½" slump, air entrained concrete could be consolidated in 20 seconds using a 10,800 rpm vibrator, while it took 3 minutes to do the same job using a vibrator of the same weight operating at 3600 rpm.

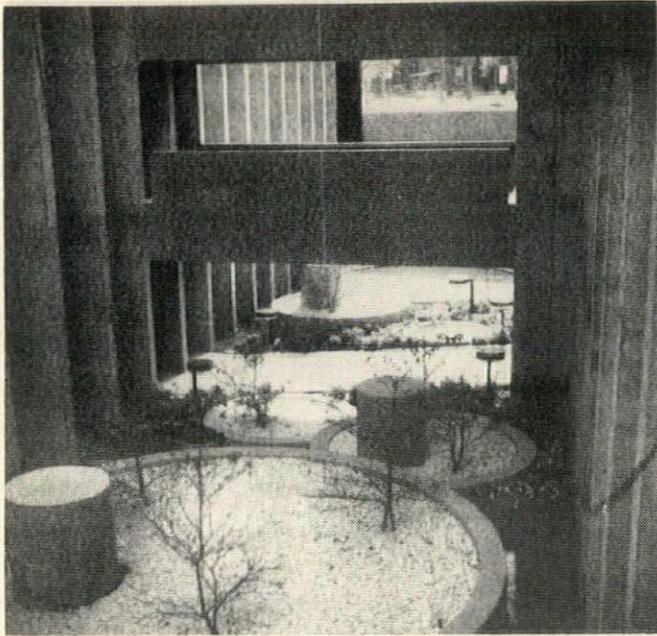
The selection and training of vibrator operators is very important. They must be aggressive, thorough and men of good judgment. They must be fully informed and trained in all techniques required to accomplish **quality** concrete compaction. **Except for poor forms, more bad looking concrete jobs can be attributed to poor or inadequate vibration than to any other cause.**

The intensity and the amount of vibration that should be used has been a controversial subject among engineers, construction superintendents, concrete foremen and inspectors for many years. Fears of over-vibration are too often expressed.

Under certain conditions, when using undesirable high slump mixes, over-vibration can happen but we find from experience that more imperfections, including segregation, water pockets and bubble holes, result from inadequate vibration rather than from over-vibration. **Well proportioned low slump, air entrained mixes are not easily over-vibrated.**

An ACI publication titled "Consolidation of Concrete," by ACI Committee 609, is an excellent report on the subject. They recommend that **"When there is doubt in the mind of the vibrator operator, the foreman or inspector as to the adequacy of vibration it should always be resolved by further vibration."**

There is one tough job that cannot be accomplished by vibration and that is the removal of air bubble holes from inward-sloping formed surfaces. We have found, however, that water pockets and air



bubble holes can generally be eliminated from vertical formed surfaces by adequate vibration.

#### Delivery and Placing Schedules

The responsibility for placing quality concrete is divided between the ready mixed supplier and the contractor. It is a joint undertaking where each party must be equipped, qualified and ready to do his part.

We find most ready mixed companies meet these requirements and are eager to do their parts. Well established firms can furnish valuable advice and assistance in selection and development of mix designs best suited to meet job conditions. The contractor should take full advantage of this service. He should consult freely with the ready mixed supplier during planning stages of the job, also when confronted with special concreting problems on the job.

Delivery schedules should be worked out with the supplier as far in advance as possible. Then when deliveries start the contractor and his concrete crew must be fully prepared to receive, place and protect the fresh concrete as scheduled. **For the sake of quality concrete unloading delays must be avoided as much as possible, especially during hot, dry weather or during cold weather when the fresh concrete has been preheated and contains an accelerator.** A breakdown in job control under such conditions, as well as during normal conditions, can result in inferior concrete, added cost to the contractor and undeserved discredit to the ready mixed supplier.

It is imperative during placing operations to have means of instant and continued communication between the project and the ready mixed plant. In event unforeseen delays develop, either at the project or in delivery, each delay should be made known immediately so steps can be taken as may be required to prevent cold joints or delay in unloading ready mixed concrete. Making full use of the plant-

to-truck, two-way radio communication provided by modern ready mixed companies is of great help to the contractor, as well as to the supplier, to maintain desired control while concreting operations are in progress.

Solutions to problems usually confronted, and placing techniques that should be followed to produce quality concrete, are discussed in ACI Standard 614-59, a 31-page publication titled "Recommended Practice for Measuring, Mixing and Placing Concrete." This publication offers a good review for anyone concerned in planning and directing concrete work.

#### Supervising Concrete Floor Construction

**The construction of finished concrete floors is a kind of work which requires closer supervision than most other types of concrete work** and all phases of this work should be given the personal attention of the construction superintendent. He cannot depend too completely on the foreman and cement finishers, as is often done. They generally enjoy doing a nice looking job but they do not always understand the techniques and procedures that must be followed to produce floors of dependable quality and durability. The contractor or his superintendent should plan and follow through to make certain that the concrete mixes are of correct design, that the required techniques are followed and that workmanship is correctly applied.

There is much more to be said on the subject than can be covered here. However, I wish to point out some of the most important aspects of the job that should be considered.

**Crack control is a matter of major consideration in any concrete floor.** Much can be done to eliminate unsightly and often damaging cracking by limiting the spacing of control or construction joints in both directions and keeping panels approximately square; also by casting panels in checkerboard fashion. Special attention should be given to the design and construction of joints to make certain they will really work, are neatly made and the layout of the panel patterns meets the approval of the architect.

**Mix design for floor concrete must be given special consideration.** Structural concrete mixes are not always satisfactory for finished floors. Low slump, air entrained mixes with more cement are generally more desirable. A minimum of 6 sacks of cement per cu. yd. is recommended for monolithic trowelled floors. Where the floors are to be covered with composition the cement content may be slightly reduced.

Because air entrainment helps to produce plasticity, reduces bleeding and segregation, a minimum of 2 to 3% should be used in mixes containing normal weight aggregates, for almost all concrete floors. When lightweight concrete is used, a higher percent of entrained air is needed for workability, ranging from 4 to 7%. Entrained air contents, in amounts recommended by ACI Committee 613-54 to resist erosion caused by freezing and thawing, should be

considered a **must** for all exposed slabs, except when dry shakes for special monolithic surface treatments are added. Because entrained air reduces bleeding and speeds finishing time, air content in excess of 3% can cause blistering and peeling when trowelled-in-color or special wearing surfaces are added.

**Floor finishing operations** should be given personal supervision by the construction superintendent until he is certain that his foreman and crew follow the required rules and techniques.

**No floating or finishing operations of any kind should be permitted while bleed water or excess moisture is present on the surface.** After leveling operations are completed final floating and trowelling operations must wait out the bleeding period until all visible water has disappeared and until the concrete will sustain foot pressure with about  $\frac{1}{4}$ " indentation.

These are basic rules of concrete finishing and cannot be overemphasized. ACI Committee 302 points out in its report, **"If bleed water is worked into the surface of a floor, the water cement ratio of the surface of the concrete is increased with resulting decrease in strength, durability, abrasion, resistance and other desirable properties."**

**During hot dry weather particular attention must be paid to protection and curing of fresh concrete floors to prevent craze cracking and loss of moisture. During cold weather, care must be taken to prevent carbonization of freshly trowelled floors by gases from salamanders or unvented heaters which will make the surface soft and dusty.**

I have witnessed severe damage where burlap from sacks that contained sugar were used for wet curing. The sugar solution prevented the trowelled surface from hardening.

Polyethylene film and curing compounds have become popular curing aids; however, they have limitations. **Plastic membranes should not be used for curing monolithic colored floors or panels, or uncolored floors or panels where uniform color of the concrete is desired.** The uneven distribution of moisture on the concrete surface under the film will make the surface blotchy in color and any wrinkles in the film will be clearly imprinted on the concrete, resulting in unsightly color patterns.

Sprayed-on curing compounds that act as bond breakers must not be used on slabs to which toppings are to be added. Likewise, they should not be used to cure trowelled floors scheduled to be painted or covered with resilient covering unless the supplier will furnish a written guarantee that it will not affect the bonding qualities of the concrete.

All procedures that should be followed to properly finish, protect and cure concrete floors are contained in a recent 56-page report by ACI Committee 302 titled "Recommended Practice for Concrete Floor and Slab Construction." Copies are available from

ACI headquarters in Detroit. It is the best guide I know of at this time for those who are interested and may become responsible for quality concrete floor construction.

### Preparation and Care of Concrete Test Cylinders

**The strength of cast-in-place concrete as reflected by results of tests made of specimens cast on the job are of great importance to the contractor and the ready mixed supplier, as well as to the architect-engineer and owner.** This is because the acceptance of a concrete structure from the contractor as regards load carrying capacity and structural safety, and the acceptance of the concrete from the supplier is not questioned, when the results from tests made from field cast specimens meet the specified strength requirements. If, however, it is found that the evaluation of the tests does not meet the design requirements, very serious consequences can ensue which may involve a large amount of money and which may also involve the reputations of the contractor and the concrete supplier.

For these reasons the contractor must give personal attention to the preparation and care of job-made test specimens on all structural and architectural concrete projects.

**Exactng procedures should be established and supervised by the contractor, in co-operation with the architect-engineer or the inspector, to make certain that the method of sampling the fresh concrete, making air and slump tests and that the preparation and care of test cylinders are performed strictly in accord with an acceptable standard practice.**

A quotation from Publication No. 44 of the National Ready Mixed Concrete Association is a most appropriate statement regarding this subject. It reads as follows:

**"If a sample is really representative and if test specimens are made and handled properly, then the test results can be considered to reflect the quality of the concrete. On the other hand samples which are carelessly taken cannot yield significant results no matter how well the tests are made. The exercise of informed judgment in selecting samples is indispensable."**

The National Ready Mixed Concrete Association has spent much time and study on the evaluation of test results from field test specimens. They have found that even when standard procedures for sampling, making, handling and curing of field test specimens are conducted with meticulous care, up to 10% of the tests have shown values 20% below the average. Because of this fact provisions should be made to cast a sufficient number of test specimens on any important or large project to make certain that representative test results are obtained.

The standards of the American Society of Testing Materials, #C-172 and #C-31 for "Sampling Fresh Concrete" and "Making and Curing Concrete Com-

pression and Flexure Test Specimens in the Field," have been generally adopted for building construction projects in the United States.

Daily field control of air content and slump are important functions of the construction superintendent. When air entrained concrete is being used for structural concrete the air content should be currently checked to make certain that the maximum allowable percentage of entrained air as determined by the mix design is not exceeded.

A contractor in Minnesota recently had the unfortunate experience of making a large pour on a structural concrete building that failed to develop strength requirement because of excess entrained air in the concrete. The cost of taking down and rebuilding the structure could have been avoided if an air test had been made when the first load of concrete was delivered to the job.

**The procedures to be followed in carrying out the testing program for any construction project should always be fully covered in the contract specifications and then it should be given full recognition and support of the contractor, regardless of who is delegated the responsibility of carrying out the program.**

On projects where the contractor is responsible for sampling and casting test cylinders, as well as care and delivery of the specimens to the laboratory, the construction superintendent must make certain that the prescribed standard procedures are followed. This is not a difficult assignment. I have found that by rigidly following six simple but essential rules tests of job-made specimens will reflect the strength of cast-in-place concrete within acceptable tolerances. The rules are as follows:

1. **Make certain the concrete samples represent a good average of the concrete being placed.**
2. **Make and record results of air tests and slump test from the same sample used to cast the test specimen.**
3. **Do not re-use concrete from slump test or from air test to cast specimens.**

4. **Use standard procedures to fill and compact concrete for each test specimen.**

5. **Do not move or jar test specimens during the first 24 hours after they have been cast and deliver them to the laboratory as soon thereafter as is practically possible.**

6. **Handle test specimens with the same care as you would handle glass containers and keep their temperature between 50° and 70 F. until delivered to the testing laboratory.**

If these procedures are followed, erratic and unreliable concrete test reports, which are so exasperating to the contractor and the concrete supplier, can be avoided. The added cost for extra effort and care required to provide reliable test specimens is small indeed in relation to the benefits gained.

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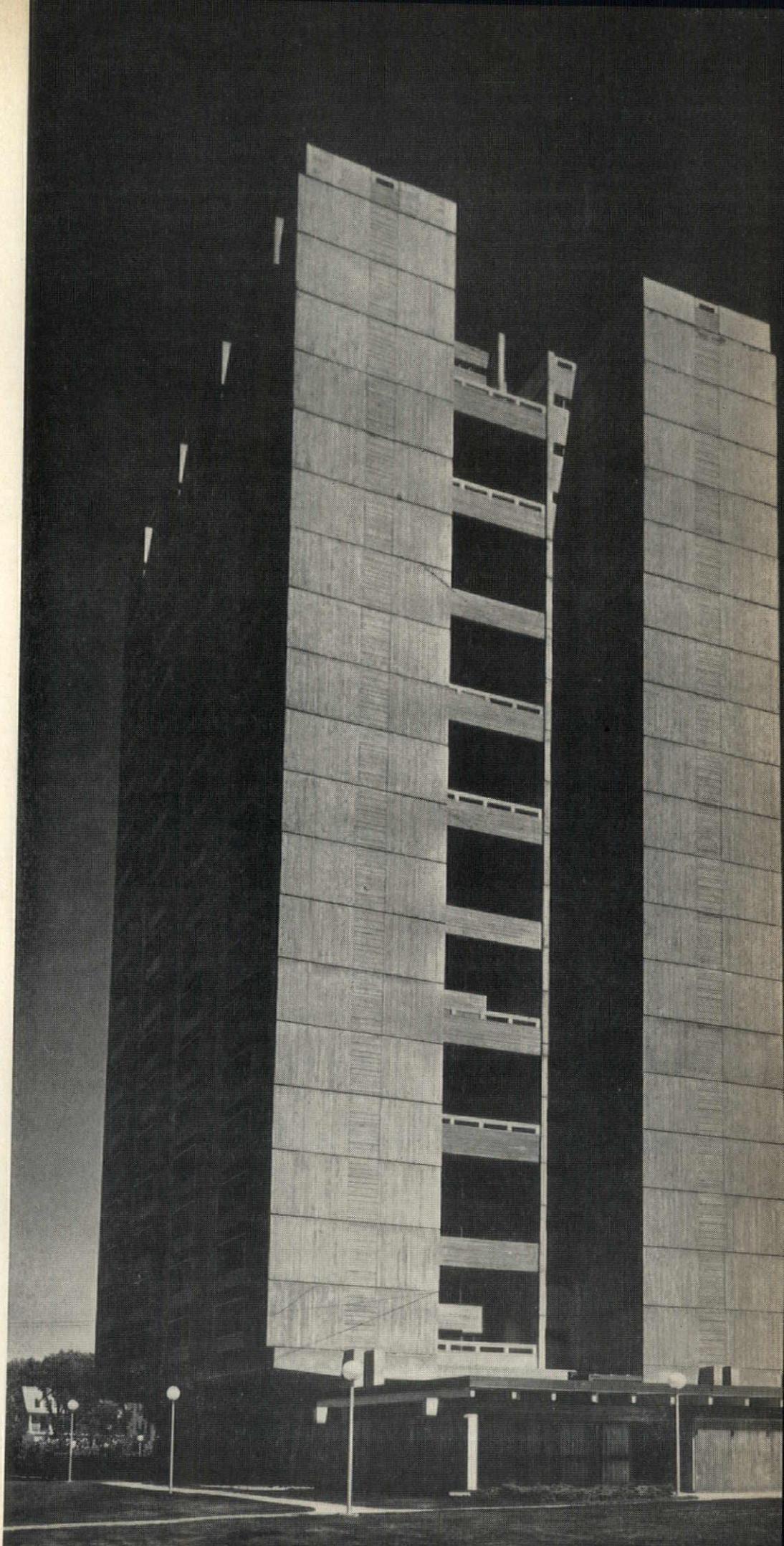
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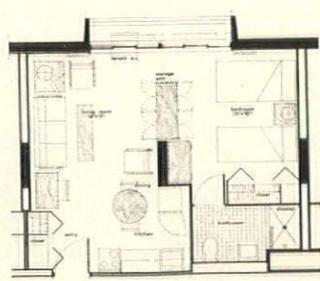
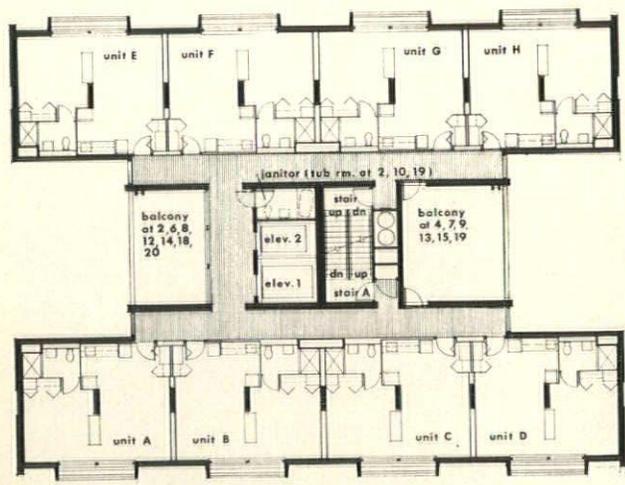
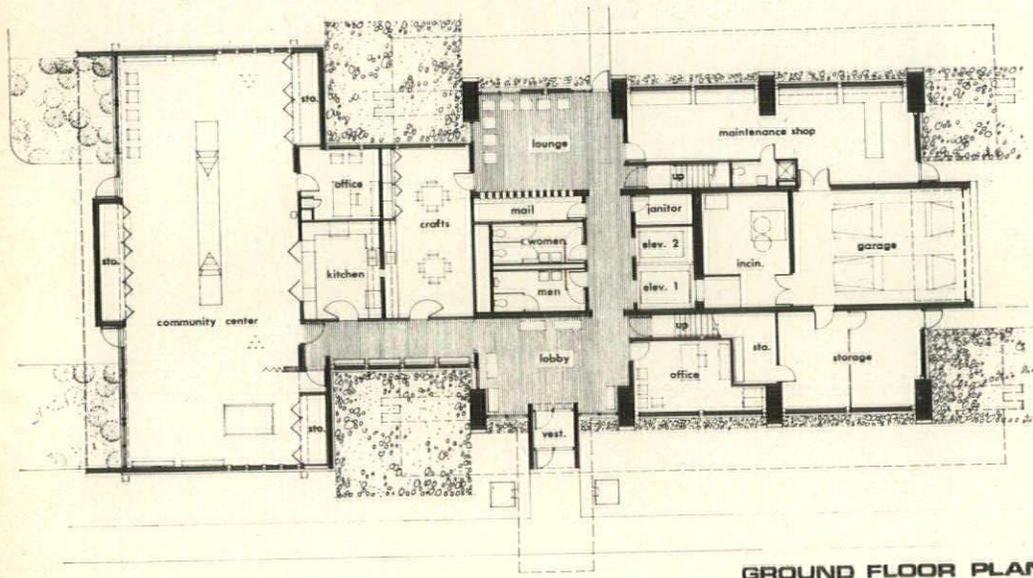
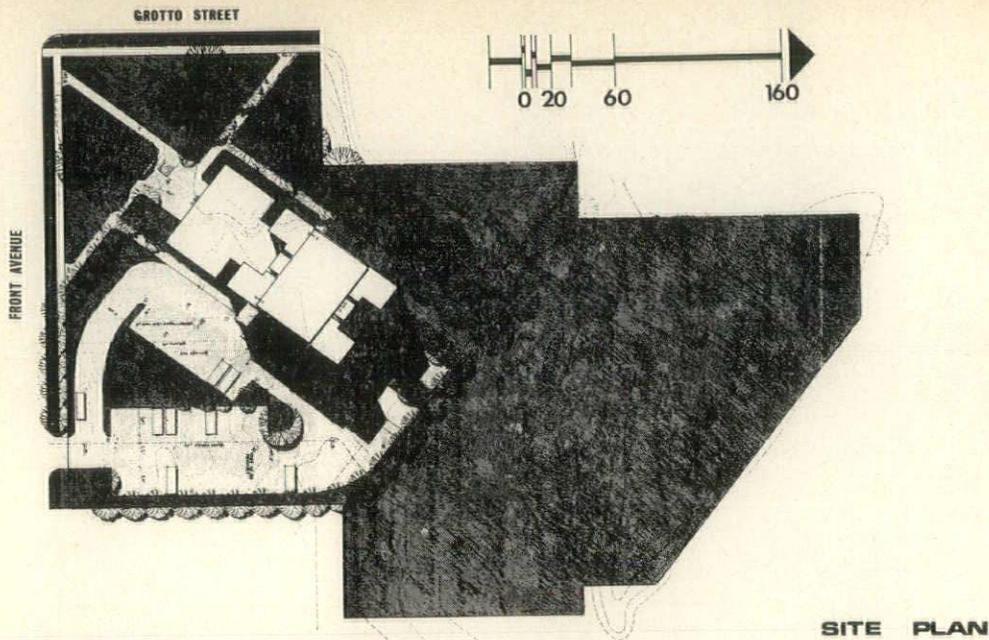
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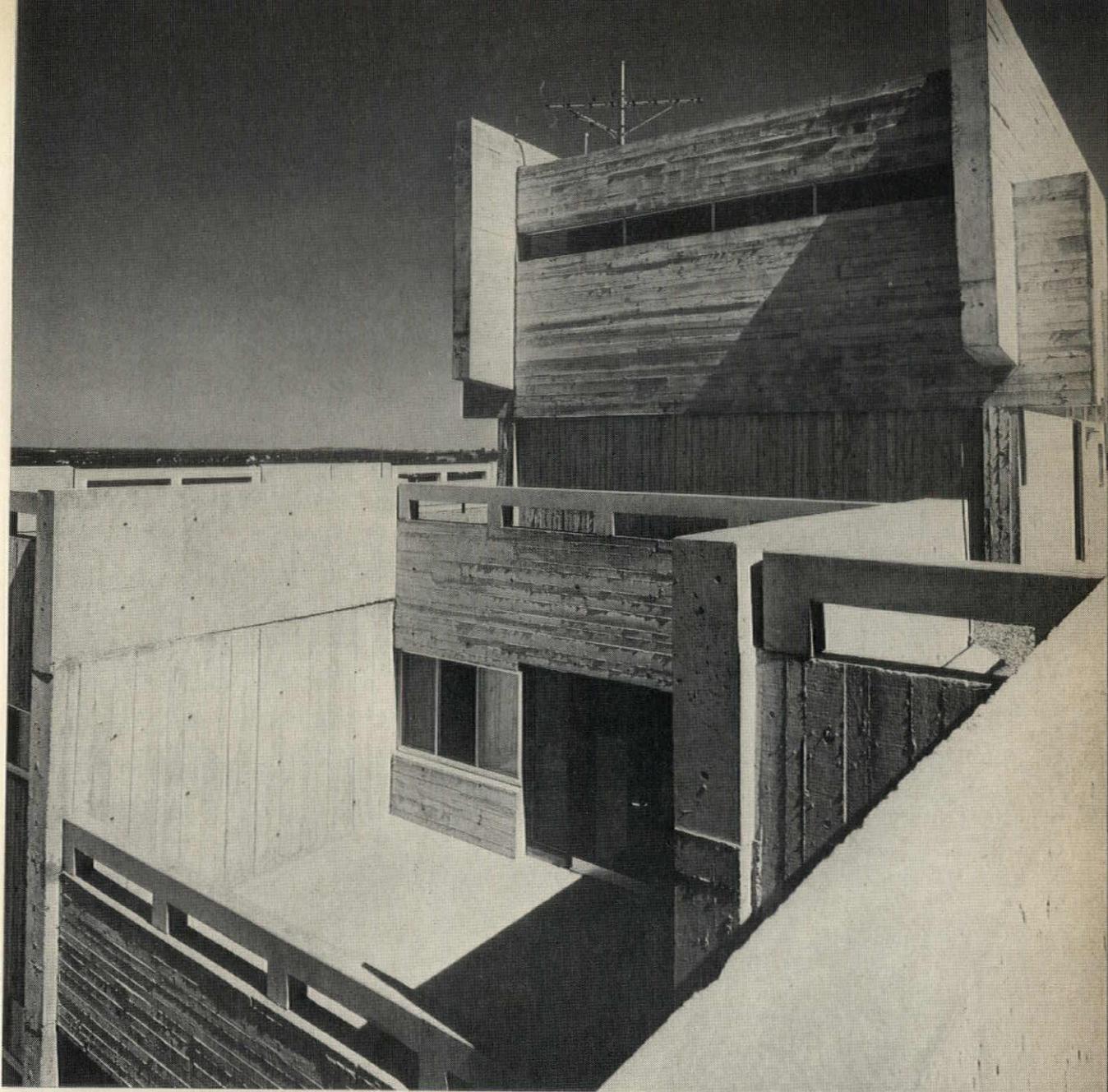
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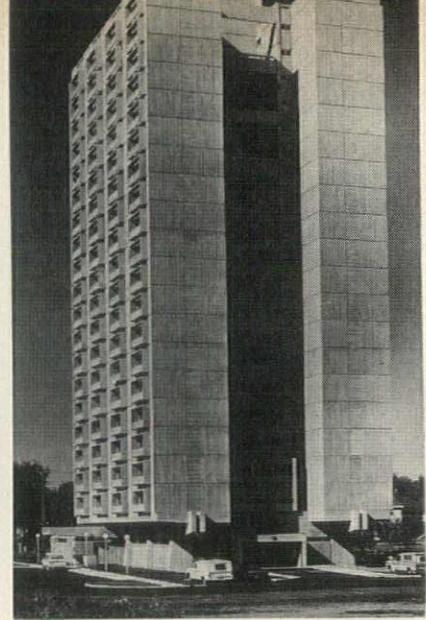
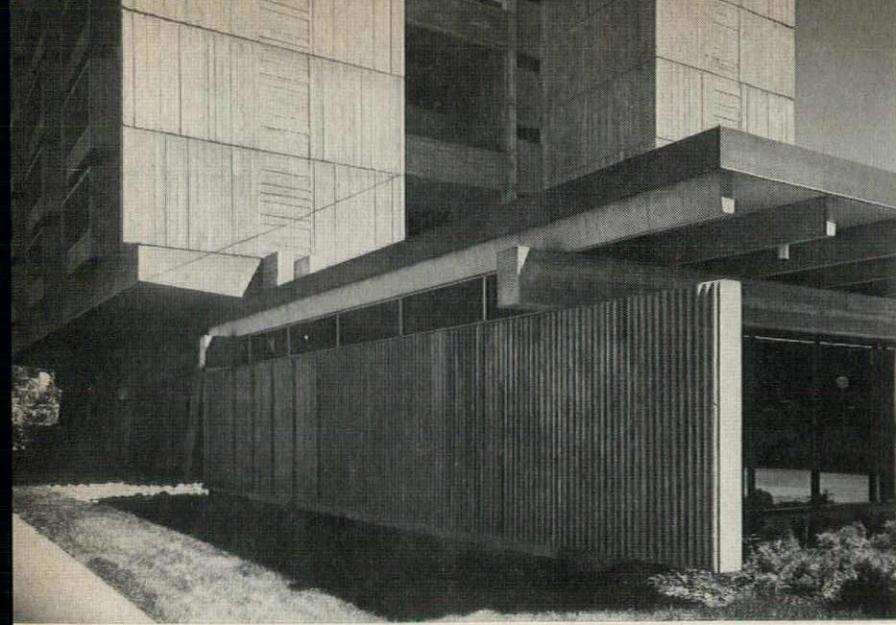
**HOUSING AND REDEVELOPMENT  
AUTHORITY OF THE CITY OF  
SAINT PAUL, MINNESOTA**

**EDWARD N. HELFELD,  
EXECUTIVE DIRECTOR**









The project is located in an older residential area of larger multiple-dwelling houses and walk-up apartments. Commercial, medical and recreational facilities are within easy walking distance and public transportation is immediately accessible. The city's largest park is three blocks away. There are many elderly persons living in the area, along with a diversity of families.

The project contains an active community day center staffed by a local agency and opened to the residents of the building and the elderly in the surrounding neighborhood. The north end of the site is an unbuildable wooded area to be developed by the authority as an extension of the outdoor facilities. An outdoor bench area is also being developed outside the community room for sitting, waiting and observing the activity of the neighborhood. Extensive landscaping has been initiated around the immediate building and sitting areas.

The site is an old river bed with up to 150 feet of poor bearing soil, in places necessitating the use of deep piling. This indicated a very compact plan situated on the best soil on the site in order to stay within the economic limitations of the program. A compact plan would also keep the maximum amount of the site open and the circulation of the elderly at a minimum. The concept, therefore, was to avoid a long double loaded corridor arrangement and develop a light, airy core to give scale and intimacy to the circulation. The building clearly expresses its component functions and parts: the structure, its dwelling units, circulation and services, its social and communal areas.

The ground floor contains lobby and lounge areas, office and maintenance spaces. The community day center is a one-story element linked to the tower base. A mechanical mezzanine is between the ground and second floors. This space serves as a collection area for mechanical equipment for the tower and the air conditioning equipment for the ground floor. The typical floor has eight dwelling units, four on each side of a central core containing the elevators, stairs and common service facilities. Every elevator landing is light and cheerful with a fine view. Large open balconies, two to four stories high, are located at each end of the core to provide additional smaller community gathering areas throughout the building. Short corridors with vista windows provide semi-private vestibule areas for each two units, giving a pleasant entrance to each apartment. The apartments face the two major views. To the northwest and west is the major park and lake and a distant central business district. To the southeast is a near central business district. The apartment windows are large and protected by a precast concrete sunshade that gives dimension to the opening from the interior and creates a strong sculptural effect on the exterior. The living and sleeping areas are separated by a moveable wood storage unit providing a more open feeling and also facilitating the use of individual room air conditioning units.

The entire structure of the building is concrete. All surfaces exposed to weather had air entrainment

and the exterior wall surfaces are lightweight for greater insulating value. Some 6,000 yards of concrete were used.

The floors are flat slabs bearing on the core and the exterior walls. The core "H" serves as the structural stiffener of the tower. The loads are carried down to a heavy platform at the mezzanine level. Two large beams which form the mezzanine mechanical area pick up the cantilevers of the tower and transfer it to eight piers supported on deep piling. The compactness of the structural bearing resulted in substantial economy in the piling. The ground floor slabs are structural, with the walls carried on grade beams. A spiralling system of form re-use was devised which allowed one floor to be poured every five days and each form to be re-used up to ten times.

Wood board forming was used almost exclusively, to create a textured surface and to cover up the inherent irregularities of concrete.

The ground floor walls were formed using 2 x 2 wood strips, spaced apart, which results in a heavy fluted texture. The tower walls were formed with random width, rough sawn, pine and fir boards which results in a varied striated texture. The pine and fir boards differed in thickness which gives another dimension to the texture. The floors are defined by a 1 x 2 kerf joint. The windows of the units are shaded by sculptural concrete sunshades which were precast on the site and anchored to the wall by stainless steel bolts. The balcony railings were also precast on the site. The roof of the community center uses keystone joists.

The interior has exposed rough board form concrete around the core and white gypsum walls with large patches of color in the corridors to identify floors. Dark, stained wood is used at the elevators. A sprayed-on textural finish was used on the ceilings.

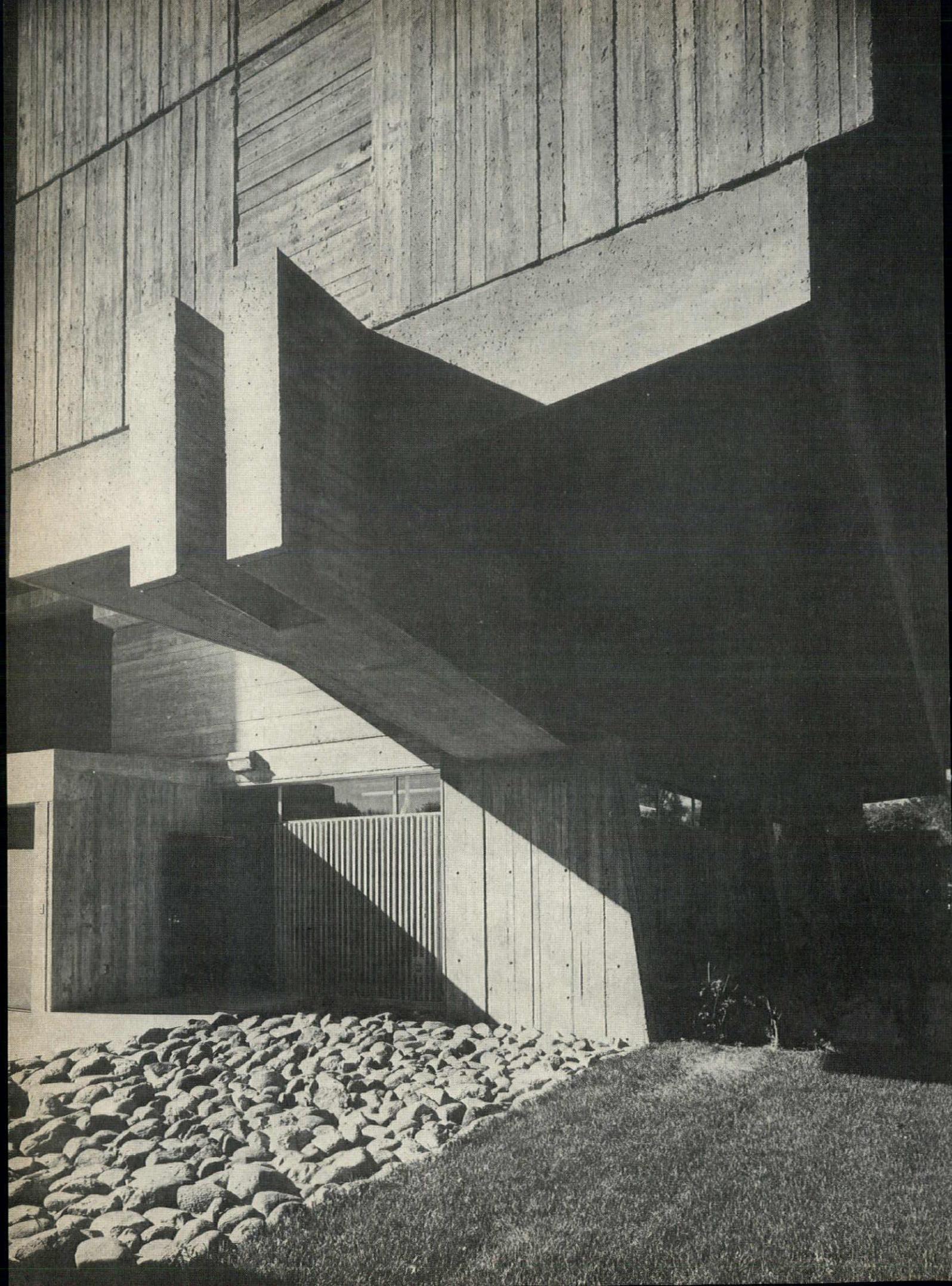
Movement in the structure was compensated for with vinyl gaskets at the gypsum partitions.

Light and shade was an important design element, serves to define the parts of the structure and provide interest and relief throughout the building.

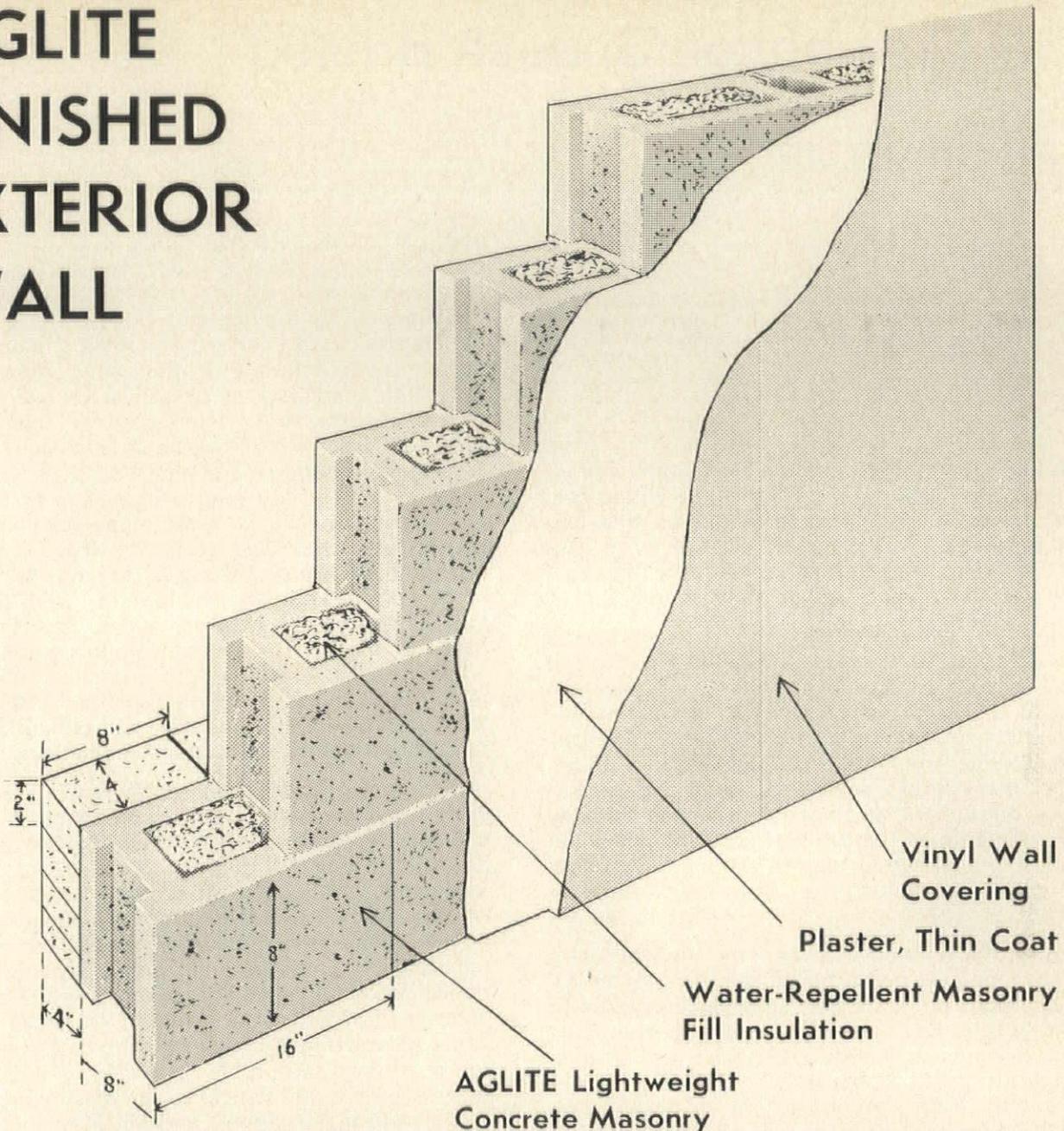
The building contains 115,000 square feet and was finished in 1969 with a total cost of \$1,949,000, including site development and also including some \$75,000 for piling. There are 150 one-bedroom dwelling units, a two-bedroom caretaker unit and a community day center.

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# MSA Convention Speech Briefed

EARL CRAIG, JR.

EARL CRAIG, JR.

Termed a "soft-spoken, rational radical," Earl Craig is past national director of the New Democratic Coalition and is currently an instructor in the Department of Afro-American Studies at the University of Minnesota. His recent campaign against Hubert Humphrey for the U. S. Senate nomination on the DFL ticket emphasized the im-

**"I'd like to talk on . . . the topic of people and institutions. My discussion of that will be within context of seeing the situation in which we find ourselves as people or as members of or parts of institutions at a time when I think we need to worry about our survival as a people and as a civilization. . . ."**

"Often during the campaign I got into arguments with people involved in zero population growth. The argument centered around the fact that I was not willing at that time, nor am I now, to support any measures that I would call coercive in order to control the population, which does not suggest that I do not consider population a legitimate issue and a great concern, but as long as society still makes so many value judgments on the basis of race and class, the execution of coercive measures in controlling population will also be made on those same kind of criteria. . . ."

"I think the problems in terms of survival relate not to evil people, or to terrible systems, or to demons on this side or on that side, but to a kind of inexorable force or mood of history that seems to be moving in a way that is difficult for us to find handles to get in front of it and turn it around. . . . There is a fight in North Carolina having to do with the Petro Chemical Plant. The fight has to do with those who are trying to keep the chemical plant from being built on the one hand and a significant portion of the black community on the other hand which sees this as the first real opportunity for meaningful jobs. At a time when people are sufficiently frightened of black people and Indians and young people that they may not so much out of their evil or racism, but out of the depth of their fear, will not support those things necessary to produce the kind of changes that we need. . . . **I'm trying to suggest that people, not so much because they are evil or nasty or bias but because of going along in their own traditional ways of functioning—a combination of all these may be enough to keep us from making the kind of changes that we need.**

"I will also talk about institutions out of the context of the fact that despite the notoriety given to it by, what's his name, oh! Agnew, I consider myself a radical liberal. . . . I consider myself a radic lib,

which is not really a nice thing to be not only because Spiro Agnew says it isn't but because you're not really trusted by the radicals and you're not really trusted by the liberals. But I consider myself a radical because I think the problems that we face demand not patchwork solutions, they demand fundamental reordering or priorities, demand fundamental changes in assumptions underlying institutions. . . . I don't think we made a mistake in Viet Nam in a semantic kind of sense because Viet Nam, it seems to me, is a logical extension of the kind of assumption that we have made about how we should function in the world and if we leave Viet Nam without changing those basic kinds of assumptions, then we've learned nothing. . . . I'm trying to suggest that what we need is not so much to put a patch on the welfare system, to put a patch on the educational system, or to put a patch on the problems of transportation in metropolitan areas but **to fundamentally rethink the kind of assumptions that underlie those areas, institutions and policies.**

"I consider myself a liberal because I'm not convinced that because I see the problems in various programs or policies, that merely by tearing them down something that comes in its place is automatically going to be better. Secondly because I think we need to be very worried about increasing polarization. One of the things that those of us who are radicals find ourselves often doing is trying to out-radicalize one another and in the process isolating ourselves further from the rest of American society and so involve ourselves in the kind of rhetoric in relationship to the problems and in relationship to the rest of society which is not dissimilar to that indulged in by Mr. Agnew and Mr. Mitchell and Mr. Nixon.

"I think that very sketchily I am trying to suggest it is out of this concern for our survival and out of my own kind of personal commitment that I shall try to talk about three or four institutions. . . ."

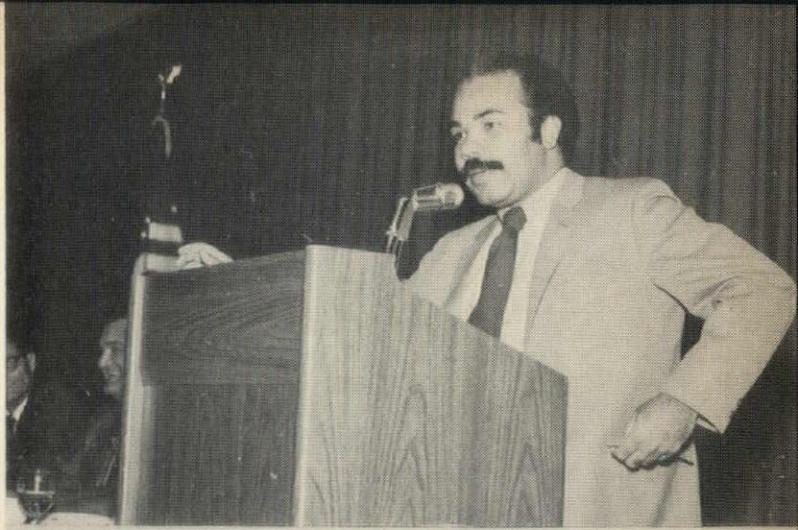
**"It is not an understatement to say that the police forces in the United States are now at the very heart of much of the social upheaval in our country and in a very real sense are in the very front lines of the battle.** More and more people feel that the contention around the police is the essence of the struggle for change or maintaining the status quo. There is a lot of publicity about this of late, but black people and Indians and Chicanos have considered the police a, if not the, vital issue for a long, long time. Abusive, overtly racist, brutal, insensitive—all of these are ways of viewing the police in minority communities. Essentially, viewing the police as the arm of a colonizing army to maintain the lives of peo-

ple within the walls of the ghetto and so, although for much of the rest of society the police have become a focal point, for a long time the police within minority communities have been the visible, real, obvious every day and every night manifestation of the enemy and the oppressor. On the other hand, support of the police for many persons has become the way in which all of society's ill will be solved. . . .

"One of the tragedies is that in the midst of contention even some of the most sensitive agencies within our society have indicated an unwillingness to change in relationship to the police. The place where I work is now in the midst of a controversy about the selection of a police chief. I will not really get into what I consider the very tragic situation of the university's administration discouraging a man from applying for a job because he might not be able to get along with the mayor of our fair city. One of the more tragic things is that the outgoing chief of the University of Minnesota police department has officially refused to co-operate and has strongly discouraged any participation by his officers in the newly formed Criminal Justice Studies Department at the university. Simultaneously at a time when some radical activist students think that department, and I think wrongly, should not be a part of the campus. In a sense what happens is that the police force . . . has been concerned to maintain itself as is, without even co-operating with that other part of the university which is concerned with re-evaluating the role of the police and provide a positive role for them—because the police are going to stay, they're not going to be eliminated. . . . **I can't tell you what is the way we're going to solve the problems of crime, and the fears of people about repressive police departments and lawlessness, but I do know that to try to say that what we have been doing is all right and all we have to do is more of the same is a tragic, stupid error. We need to fundamentally re-evaluate those kinds of assumptions.**

"Similarly, it seems to me we ought to re-evaluate the welfare system. The welfare system has not benefited the society, it has not benefited the people supposed to receive benefits. Another institution, another myth is that medical care in the United States is the best in the world. Maybe in terms of high-level research it is the best in the world but in terms of life expectancy for, say, a boy of ten 31 nations in the world are above the United States. . . . I think we need to move from an emphasis on solo practice to group practice, with greater emphasis upon comprehensive medical care and preventive medicine. . . .

*(Continued on Page 126)*



# Need and Design of Fallout Shelter

By William Milbraith, A.I.A.

Member, Fallout Shelter and Disaster Committee

**SOME BROADSCOPE AREAS** of possible destruction which could endanger society's way of life during the 1970's were discussed in a preceding article in Northwest Architect. The following considerations are presented to invite intensification of architects' conscious striving to appropriately deal with the need and design of physical sheltering against destructive effects of potential manmade nuclear disaster.

In an address on "Defense vs. Retaliation" Eugene P. Wigner discussed data which emphasizes the urgency for protectively preparing against the three significant measurements of enemy strength: num-

ber of warheads, total explosive power and area coverage. The potential of these three measurements as reported by the British Institute for Strategic Studies indicate that the U.S.S.R. during 1970 probably will have caught up with the diminishing superiority of the U. S. Under its basically humanitarian philosophy the U. S. certainly avoids planning a first warhead strike, thus negating our effective military strength in relationship to the number of our available warheads. These studies suggest the following issues:

1. The U.S.S.R. has 4 to 5 times more total deliverable explosive power (Figure 1) than possessed by the U. S.

2. Preparation against area coverage (Figure 1), a measure of instant destruction, could become a decisive survival factor and an impelling reason for fallout shelters. The U. S. is only 20 to 30% behind the U.S.S.R. in terms of area covered. The total civil defense picture in the U.S.S.R. appears to be much superior to that of the U. S.

3. U.S.S.R.'s launchers can, as a rule, loft much larger missiles than U. S. launchers can, thereby eroding numerical advantage (Figure 2).

While summarizing some crucial aspects of strategic balance affecting national security, Secretary of Defense Melvin Laird has said, "... in the space of five years, from 1965 to 1970, the Soviet Union has more than tripled its inventory of strategic offensive nuclear weapon launchers from about 500 to about 1,700, which includes some 200 heavy bombers in both totals, and continues the momentum of a vigorous construction program. In that same period the Soviet Union has virtually quadrupled the total megatonnage in its strategic offensive force. The United States, on the other hand, in the same period made no increase in its established level of 1,710 strategic nuclear missile launchers and reduced its heavy bomber strength of 780 by more than 200. In that same period the United States also reduced its megatonnage by more than 40%.

Gen. John C. Meyer, Vice Chief of Staff, U.S. Air Force, discussing deterrence in an article entitled "Military Balance Between U.S.-U.S.S.R. Has Narrowed," stated, "As we now (May 1970) stand the Soviet ICBM force, together with their existing submarine launched ballistic missiles, has more than twice the payload of the entire U.S. land- and sea-based missile force."

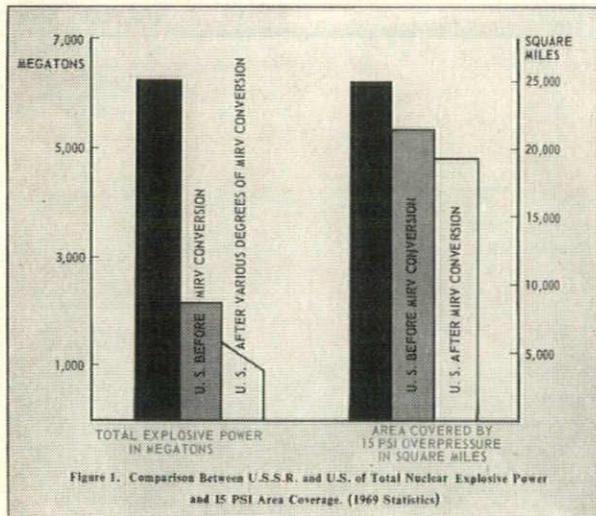


Figure 1

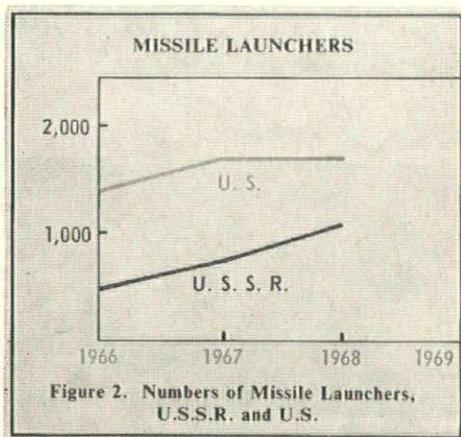


Figure 2

In attempting to protect against the threatening possibilities of nuclear weapons the United States continental forces have two strategic objectives: (1) to maintain a deterring capability for inflicting unacceptable damage on an attacker, even if that attacker were to strike first ("assured destruction") and (2) to minimize extent of damage to our population and industrial capacity ("damage limitation") in the event a nuclear attack should occur.

It is the objective of the Office of Civil Defense to cause development of a nationwide system of fallout shelters stocked for survival and supported by a community plan which would outline actions to be taken to warn people, move them to shelter and control and sustain them while in shelter and immediately after emergence from shelter. The continuing national survey which started in 1961 has located 4.2 million shelter spaces in the state of Minnesota. Although this exceeds the 3.7 million population a 50% shelter deficit is documented by community planners, except for major metropolitan centers, when travel time is considered in planning for community needs. Therefore, since many existing shelter spaces are not readily accessible to the resident population it is imperative to design new buildings for achieving optimum fallout protection. Public shelter capacity can be considerably increased in new construction and in the modification of existing structures by application of cost-reduction shelter design techniques developed by the Office of Civil Defense.

The fallout shelter oriented civil defense program is considered a fundamental element in the damage limitation structure of strategic national defense. The Department of Defense's wide range studies of hypothetical nuclear attacks against the United States show that fallout shelter would (1) be directly responsible for saving tens of millions of lives (Figure 3) and (2) have a greater life saving potential, for the relative investment involved, than any other element of strategic defense (Figure 4).

Fundamental concepts of protection against nuclear weapons' effects related to objectives of the fallout shelter program involve three basic classifications of nuclear explosions as related to the

earth's surface: (1) surface bursts, (2) air bursts and (3) subsurface bursts. Effects of these bursts vary and include, in differing degrees, thermal radiation, blast and shock, initial nuclear radiation and residual nuclear radiation (Figure 3).

In an attack on this country the geographical

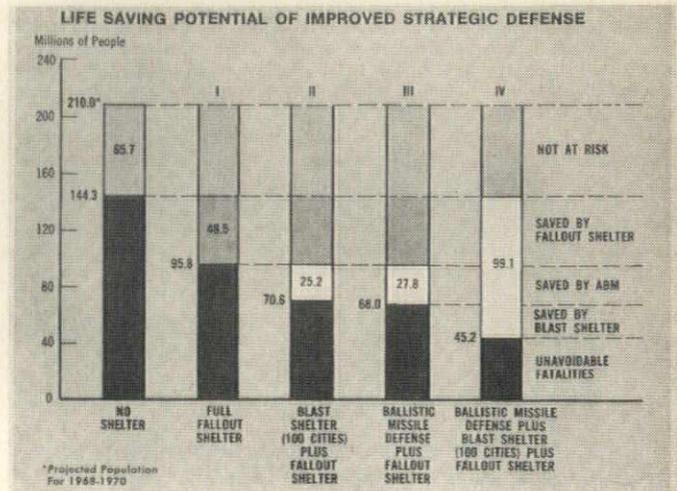


Figure 4

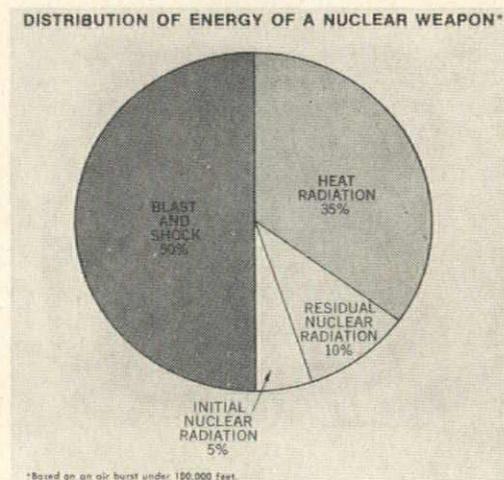


Figure 5

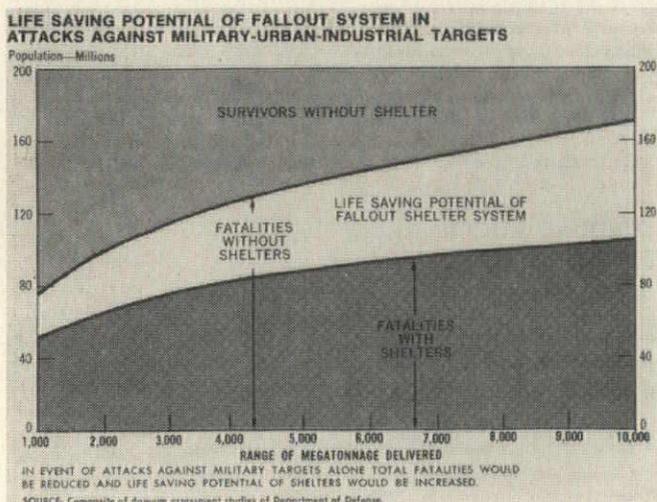


Figure 3

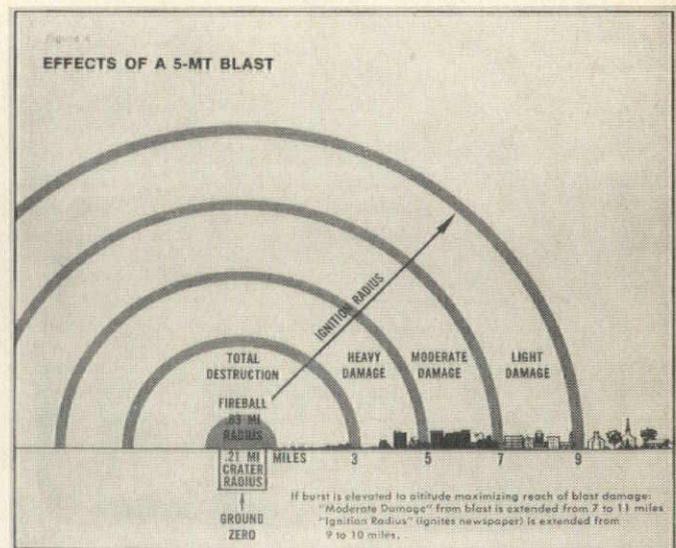


Figure 6

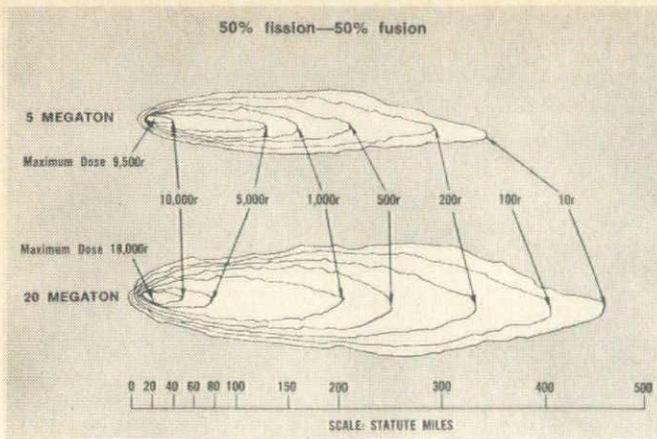


Figure 7

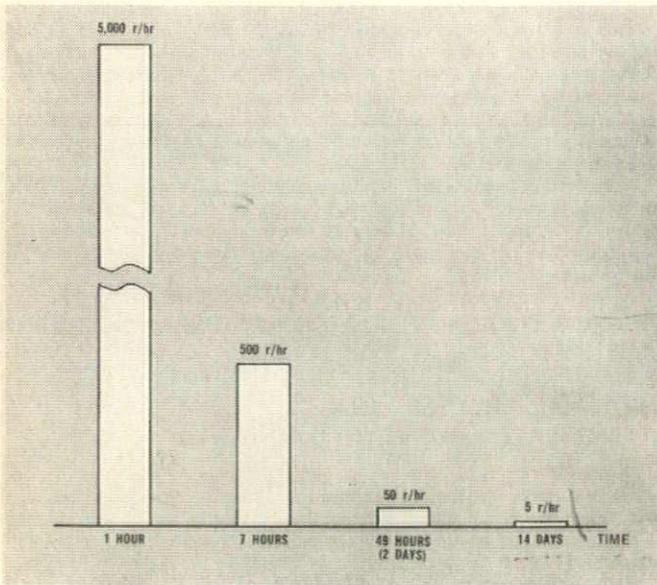


Figure 8

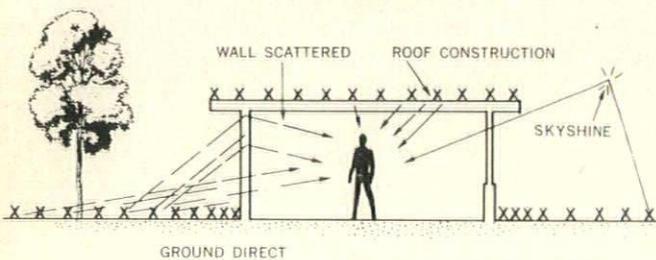


Figure 9

EQUIVALENT SHIELDING VALUES OF DIFFERENT MATERIALS

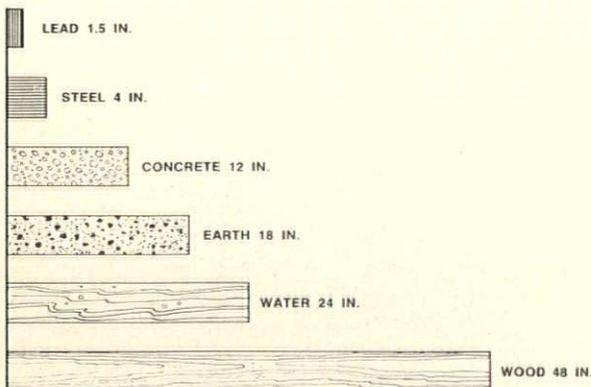


Figure 10

areas affected by thermal radiation, blast and shock and initial radiation would be relatively small compared to those areas that would be affected by fallout (Figure 6).

Protection against fallout, a very hazardous gamma type of nuclear radiation, is the primary objective of the national fallout shelter program. Based on a 25 mph upper air wind, significant amounts of fallout from a nuclear surface burst of megaton proportions would be deposited over an area extending hundreds of miles downwind from the point of detonation and covering hundreds or thousands of square miles (Figure 7).

Although fallout radiation decays rapidly with time (Figure 8) the gamma rays emanating from fallout particles can cause sickness or death to unprotected persons. Radiation injury can be prevented or minimized for persons who are in fallout shelters until the radiation has declined to a tolerable level.

Even in shelter some gamma radiation can reach an individual in an enclosure from several sources (Figure 9)—(1) the roof contribution refers to radiation from fallout deposited on the roof and (2) the ground contribution refers to all similar radiation originating from fallout particles on the ground. The ground contribution is further subdivided into ground direct, wall scatter and skyshine components. The latter is the effect caused by radiation from fallout on the ground as it is deflected by the air molecules into a structure.

"Fallout protection is obtained through use of two basic shielding approaches, barrier shielding and geometry shielding. Barrier shielding places a mass between the radioactive source and the shelter occupant, which reduces the amount of penetrating radiation. Any normal construction material can be used to create mass; however, the heavier materials, such as concrete or brick, provide a better shield than lighter materials such as wood or glass (Figure 10). Geometry shielding places people out of the direct path of radiation or at some distance from it. The effect of gamma radiation is lessened as the distance from the source is increased, much the same as light intensity decreases the further one is from the source.

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Protection factor (PF) expresses the relation between the amounts of radiation that would be received by an unprotected person and a person inside the shelter. Thus a person in a shelter with a PF of 40 would receive 1/40 as much radiation as he would if he were unprotected at the same location. Higher protection factors are achieved by geometric and barrier shielding between the radioactive source and the shelter area. Some fallout shelter design techniques that may be used to put various shielding principles into practice include the following:

#### BARRIER SHIELDING

Using precast, tilt-up, slip-form and load bearing walls instead of lighter-weight materials. Working with concrete tees and prestressed masonry units instead of lightweight floor and roof assemblies; detailing roof fills.

Arranging multiple thicknesses of walls, floors and roof slabs surrounding the shelter space. Employing courtyard walls, planters and neighboring buildings for shielding.

Filling hollow blocks with sand or gravel or otherwise increasing the weight (mass thickness) of shielding walls.

Reducing window areas; raising sill heights to shield against ground radiation.

#### GEOMETRY SHIELDING

Placing shelter in inner core corridor area or basement.

Forming earth berms, moats, pedestals, platforms or other sculptured earth shapes; sloping grade away from building. Carefully positioning and proportioning overhangs and fascia.

Providing right-angle turns at entrances; staggering openings to preclude radiations "streaming" in.

#### DISTANCE

Enlarging building envelope; positioning shelter remotely from peripheral walls; raising a canopy high above sheltered floor.

Placing shelter in upper two-thirds of a multistory structure, with two or more floors above.

#### TIME

Surrounding maximum protected space with less shielded expansion areas—an arrangement called a "graded shelters." Lining shelter with stored food or other usable stock; its use (and removal) would coincide with the diminishing need for shielding.

Making use of pools of water outside shelter to act as catch basins for fallout which would settle to the bottom and be attenuated by the mass of the water covering it.

As an important part of the nationwide fallout shelter program the Office of Civil Defense is engaged in professional development and technical assistance for architects and engineers. Training courses conducted with the co-operation of educational institutions and professional so-

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cities include design techniques as well as shielding analysis methodologies and knowledge of the effects of nuclear weapons. More than 16,000 architects and engineers have successfully completed the course and have been certified as fallout shelter analysis by the Department of Defense. To assist the public in locating them, the Office of Civil Defense has published a National Directory of Architectural, Engineering, and Consulting Firms With Certified Fallout Shelter Analysis (FG-F—1.3), which is available from local or state civil defense offices.

To encourage and assist in providing for the inclusion of dual-use fallout shelter space in the design and construction of new buildings, the Office of Civil Defense provides a professional advisory service which does not furnish design services but offers advice and guidance to the A-E firm on how to achieve fallout protection through its own design effort. Without charge to the design firm or to the client-building owner the participation of the assigned advisory consultant is available to (1.) Conduct one- or two-day seminars, courses, lectures and on-the-job training sessions on fallout shelter analysis, design and construction techniques and criteria for A-E firms. (2) Review building designs to evaluate potential for radiation protection, and recommending fallout shelter design techniques, (3) Provide technical guidance concerning analysis, design and construction of buildings to increase shielding and (4) advise on the special design criteria of emergency operating centers (continuity of government), medical and communication facilities.

The professional advisory service assists in developing, in new construction, the same techniques that are being used to provide fallout protection in new federal building construction.

A special report to the annual conference of the National Association of State Civil Defense Directors in Washington, D.C., on April 8, 1970, indicated that good shelter laws by state legislatures will be a boon to the business of

| STATE          | TYPE OF LEGISLATION             | SCOPE   | YEAR ENACTED | * % OF INCREASE | REMARKS  |
|----------------|---------------------------------|---|--------------|-----------------|--|
| Alabama        | Mandatory                       | State buildings including schools under State jurisdiction  | 1969         | 2%-4%           | Shelter may be eliminated if additional costs are above:<br>4% for structures \$50,000 to \$500,000<br>3% for structures \$500,001 to \$1,500,000<br>2% for structures above \$1,500,000 |
| Arizona        | Mandatory                       | Public buildings of all political authorities incl. schools | 1969         | 3%              | Every public structure above \$100,000 cost must have shelter or a waiver by the Governor  |
| Florida        | Permissive                      | Public buildings of all political authorities incl. schools | 1967         | Not Specified   | Two acts. One pertains to all public buildings except schools. The other pertains to schools   |
| Minnesota      | Building Code                   | State agencies only   | 1969         | 1%              | Not legislated - requirements for shelter incorporated into State Building Code.   |
| Nevada         | Permissive                      | Incorporated cities and towns                               | 1969         | Not Specified   |  |
| New York       | Permissive w/subsidy provisions | Public schools and state owned buildings                    | 1961         | Not Specified   | Financial assistance to local authorities for EOCs   |
| Oklahoma       | Permissive                      | State agencies and school authorities                       | 1967         | Not Specified   | State agencies required to "cooperate" with state Civil Defense Director   |
| Rhode Island   | Mandatory                       | Public buildings of all political authorities incl. schools | 1968         | 3½%             |  |
| South Carolina | Mandatory                       | All governmental entities—two counties only                 | 1969         | Not Specified   | Two acts—one pertaining to Richland County, the other to Greenville County   |
| South Dakota   | Mandatory                       | State agencies only   | 1966         | Not Specified   |  |

\* Percent of increase allowed for shelter construction over conventional construction costs.

Figure 11

survival, especially in rural areas where deficits almost invariably occur. Nine states have specific statutes. Limited similarities exist in relation to protection from gamma radiation in the construction of public buildings (Figure 11). Minnesota has a mandatory legal provision requiring fallout shelter

construction in state funded structures. This was established by requirements which are a part of the state building code (effective date October 30, 1970). Provisions for fallout shelter, therefore, are a positive requirement with a most effective manner of enforcement, that is, "No provision for

fallout shelter, no building permit." Hopefully, the new state building code will be adopted by all political sub-divisions within the state.

President Nixon recently told legislative leaders, "If present trends continue the United States, a very few years hence, will find itself clearly in second position—with the Soviet Union indisputably the greatest power on earth."

In addition to the surveys the below-ground space may gain increased utilization by providing packaged ventilation kits. The Office of Civil Defense (OCD) estimates that the national inventory of PF 40 or better fallout shelter will grow to 240 million fallout shelter spaces by 1975. However, because not all of this shelter space will be well located in respect to where people live or work, it is probable that without additional shelter development adequate fallout protection would not be available for up to one-half of the projected 1975 population.

To close this potential gap the Office of Civil Defense is encouraging the intensification of providing dual-purpose shelter areas in existing and new structures.

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# REVIEW . . . .

## STRUCTURAL ENGINEERING HANDBOOK

By **Gaylord and Gaylord**. McGraw-Hill Book Company, 330 W. 42nd St., New York, N. Y. 10036. 1,192 Pages, 845 Illustrations. \$29.75.

Reviewed by **Amaro J. Romano**

The reviewer is a registered civil engineer and is an associate of Edwards and Kelcey, Inc., Engineers and Consultants. He heads the bridge section of the international firm's Minneapolis office.

This one-volume handbook provides a wealth of engineering data and information for anyone interested in structural design. If, for no other reason, the list of contributors (39 of them) and the text material covered (26 sections) is so impressive that you find yourself wanting to look over their shoulders to see how they handle a particular design problem. Their applications of design procedures through examples are excellent and comprehensive.

For those who enjoy in-depth mathematical solutions, there is a section on matrix application which

is ideally suited for digital computers.

On the other hand, for small offices of limited or specialized practice, the price may frighten one from purchasing this book. It shouldn't because the subject matter covered would more than compensate the expenditure. For instance, the structures covered are industrial buildings, high rise buildings, bridges, thin-shell structures, arches, tanks, towers, culverts and retaining walls. Materials covered are reinforced and prestressed concrete, steel, timber and aluminum. Also covered are sections on soil mechanics and foundations and earthquake resistant design of buildings.

As I said before, it's all there, a good handbook to have.

## HOUSE FORM AND CULTURE

By **Amos Rapoport**. Prentice-Hall's Foundation of Cultural Geography Series.

Reviewed by **Elizabeth S. Close**

The reviewer, principal of the Minneapolis firm of Close Associates, Inc., is a fellow of the American Institute of Architects and a member of the editorial committee of Northwest Architect.

Amos Rapoport is lecturer in architecture at University College in London, with wide experience in many parts of the world, including Australia and the USA. His book is a study of human dwellings and of the forces that shape them; it draws on the observations of many disciplines.

By many examples, often illustrated by the

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author's excellent schematic sketches and by photographs, Prof. Rapoport demonstrates that dwellings are shaped by a variety of factors and that no one theory can explain the form of a typical house in a given environment. Physical requirements of shelter—climatic conditions, materials, construction and technology, the particular site, need for defense—all play a part in determining the result. But social, cultural and economic factors are equally influential; the range and diversity of house forms could not otherwise be accounted for. Need for privacy, for status or respect for tradition frequently counteract the climatic considerations, as do family structure and the position of women in society.

The book is organized on the basis of various factors modifying house forms; as a result the examples cited tend to read rather like a list of frequently obscure place names in an atlas. The technique at times makes the book more tedious than the content warrants. Apart from this, the little volume is a valuable contribution to the knowledge of man's habitat, and will be of interest to any architect with an interest in housing.

### SHOCK OF FUTURE'S PREMATURE ARRIVAL

Alvin Toffler, in his recent book *Future Shock*, states that Western society and especially the United States is suffering from a malady defined as "the dizzying disorientation brought on by the premature arrival of the future." What brings on this future shock is a rate of social change that has become so fast as to be impossible for most human beings to assimilate. The malaise, mass neurosis, irrationality and free-floating violence already apparent in contemporary life are merely a foretaste of what may lie ahead unless we come to understand and treat this disease. Toffler argues that "future shock arises from the superimposition of a new culture on an old one. It is culture shock in one's own society. But its impact is far worse. Most travelers have the comforting knowledge that the culture they left behind will be there to return to. The victim of future shock does not."

Today, Toffler contends, we are all renters, all nomads. "We have not merely extended the scope and scale of change, we have radically altered its pace," he says. "We have in our time released a totally new social force—a stream of change so accelerated that it influences our sense of time, revolutionizes the tempo of daily life and affects the very way we 'feel' the world around us."

All this has happened because man can no longer absorb all that is relentlessly new, and traditional institutions seem unable to encompass and interpret headlong technological change and its social consequences. Also, accelerating change has made obsolete the methods by which we arrive at social goals. In trying to react to the current crises, our technocrats are reaching for the tried and true methods of the past with obviously little success.

Lothar P. Witteborg, chairman of the  
Department of Exhibition at Field Museum

**On Communication**—"If I could leave my class with an intelligent curiosity, a solid set of questions to ask and the skills to pursue them, I would be happy."

Susan C. Miller, Teacher.

"Architects as members of the urban development team must insist that the spaces between buildings be designed with the same care as the spaces within buildings, for it is only through the exercise of the designers' ability to humanize space that the city will be a truly fit habitat for man."

Charles du Bose, FAIA, Boston.

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# AIA . . . .

## DETROIT IN JUNE

Members of The American Institute of Architects will convene in Detroit June 20-24 to ponder "The Hard Choices" confronting the United States now and in years to come. Leaders in public affairs, urban planning, citizen participation, education and various levels of government will present to the 103rd convention of AIA ways in which the nation's resources can best meet the needs of all citizens.

John W. Gardner, chairman of Common Cause, Russell E. Train, chairman of the Council on Environmental Quality, Paul N. Ylvisaker, professor of public affairs and urban planning at Princeton University, and Robert Andras, Canadian minister without portfolio, are among speakers scheduled to address the convention.

Robert F. Hastings, FAIA, of Detroit, president of AIA, will define major facets of the convention theme. Other speakers will

discuss aspects of "The Hard Choices" created by changing patterns of settlement, how best to use human resources, and rising pressure to reorder national priorities.

## INSTITUTE HONORS

The name Kahn appears twice among the top honors announced by the AIA to be presented at the Detroit convention. The Gold Medal, most important of the awards made by the institute, will go to Louis I. Kahn, FAIA of Philadelphia, while the Architectural Firm Award will be made to Albert Kahn Associates of Detroit. The Citation of an Organization will be presented to the San Francisco Bay Conservation and Development Commission for its work on solving the tremendous problems which have arisen as the city and its residents encroached on the famous bay. The other awards made annually by the AIA are presented in various categories of related arts and professions.

Honorary memberships in the AIA will be presented to five per-

sons for their constructive works related to the industry. Lord Kenneth McKenzie Clark, director of the National Gallery in London, is best known in this country for his television series on "Civilisation." Other honorary members are Pipsan Saarinen Swanson, A.I.D., interior designer, Jeanne M. Davern, architectural journalist, Donald E. Gibson, executive director of the Indiana Society of Architects, and Robert E. Koehler, editor of the AIA Journal.

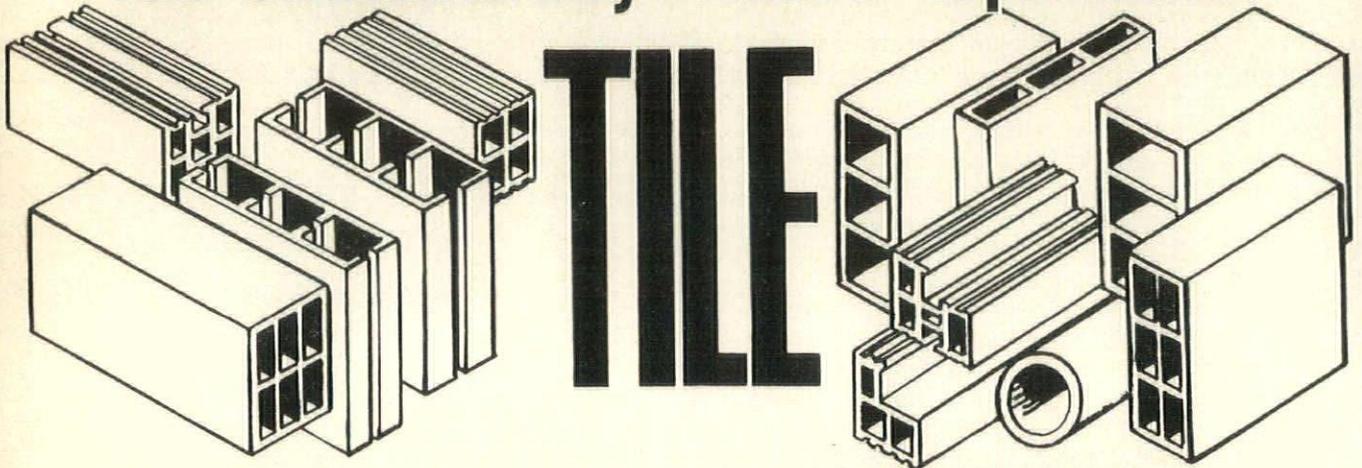
## FIRST AD

The first of a series of advertisements by the AIA to publicize the services of the profession to American economy and culture has appeared. Showing three children play-working with a model, the ad tells magazine readers:

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"Environmental education is already being taught in more than 100 communities. In time we hope to reach every American child on every grade level. If you could help influence your school-board to include environmental awareness instruction in your school system, that time could be shortened. This is essential, when you know what the most important product of a good visual environment is: It is human dignity and pride."

Our Man-Made Environment—Book 7, produced and published by The Group for Environmental Education, Inc. is available to school board members and school administrators at \$2.00 a copy from A.I.A., 1785 Massachusetts Ave., N.W., Washington, D.C. 20036.

## BREAKTHROUGH ASSESSED

The extremely compressed time schedule for HUD's operation Breakthrough seriously limits attainable levels of the program's objectives and restricts it to merely an implementation program for new techniques, according to a committee established by The American Institute of Architects to evaluate the program.

With Operation Breakthrough now in the second of three phases of development, the government is providing stewardship in the application of industrialized techniques to the development of housing prototypes for the '70s, from the standpoint of land-use

development, management reforms, cost controls, economic and social mix and community involvement in the development process.

What could be the greatest single contribution, the report says, is the development of "process" and the creation of mechanisms to make it operational: as a process prototype, Breakthrough could have greater consequences for the housing industry than any specific "product" prototype resulting from the program.

The committee urged AIA to endorse and lend professional assistance to the Operation Break-

through effort. The program, it pointed out, should not be feared as a potential threat to the architect's function by a computerized housing industry. Rather, it should be regarded as an opportunity for the profession, because of differing roles which can be identified in the process the program exemplifies—criteria development, systems design, planning and utilization of systems, and evaluation of the process and its products.

A reprint of the Breakthrough article is available from Robert E. Koehler, Editor, AIA Journal, 1785 Massachusetts Ave., N.W., Washington, D. C. 20036.

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# CSI NEWS

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MINNEAPOLIS-SAINT PAUL CHAPTER

## CSI's 15TH CONVENTION

The Construction Specifications Institute's 15th Annual Convention and Exhibit will be held in Anaheim, Cal., June 7-9, it was announced recently by Institute Pres. Ben F. Greenwood, FCSI. The theme for the convention will be "Construction Industry Communications." In going to the West Coast for the Convention after a six-year trek through the country, convention planners anticipate an enthusiastic response to the program being planned.

Emphasis of the 1971 convention is on communications — man/man, man/machine and machine/machine. The convention will follow the pattern of previous CSI conventions noted throughout the construction industry for being "working and learning experiences." In addition to the normal presentations by individual speakers and panelists the convention is expected to feature closed circuit TV presentations and hands-on demonstrations of equipment and systems, including CSI's spec data II and comspec.

The Institute vice-presidents, Charles R. Carroll, Jr., FCSI, Arthur J. Miller, FCSI, and Glenn G. Frazier, who serve as the convention program committee, are planning the sessions. In outlining the technical program for the convention the committee continues to stress existent and future programs of CSI which will benefit the small office and practitioner as well as the large offices. The convention theme and sessions are designed to provide CSI members with information which will allow them to conserve their time in preparing specifications and their time in filing, updating and retrieving information necessary for the increased production of the specifier. CSI programs, as well as other cost-saving techniques, will be presented.

Leading authorities in the techniques of construction communications will participate in the convention sessions. The sessions will take the convention through current available CSI and Construction Sciences Research Foundation programs—improved techniques and tools for advancing the art of specification preparation—through automated programs being successfully used by individuals and firms throughout the country, to a final wrap-up ses-

sion on cost, effectiveness and efficacy of applying the technological tools discussed to the individual's needs.

Time has been allotted to workshop sessions, which both enable the specifier to do the "hands on" work on specifications and technical information retrieval, and to discuss problems and new ideas with fellow members.

"Communication" is the keyword for the convention program—communication among the seemingly endless number of participants in today's construction industry and, perhaps more importantly, communication among CSI members on programs and technological advances that are and will be available—not to eliminate the use or role of the specifier but to serve as aids for expanding the specifier's productivity.

Also to be featured as part of the convention is the annual exhibit of building products, always one of the most comprehensive displays in the construction field.

#### DOCUMENT SUPPLEMENTS CSI FORMAT FOR ENGINEERS

The CSI, announced March 12 that it has published an official institute document which will form part of its well known Manual of Practice titled, Using Division 15 and 16. The new document is designed to supplement The CSI Format For Construction Specifications and was produced in answer to requests by the engineering profession to aid the user in understanding the inherent flexibility of the CSI Format, long an accepted document in the construction industry. This supplement defines the work encompassed by engineering contracts within the organizational system of MP-2A (The CSI Format for Construction Specifications, which is a standard for organization of project specifications) and illustrates four examples of indexes for mechanical and electrical contracts.

The new document shows how, within the basic framework of the Format, specifications can be written to suit the following conditions: architectural or engineering designers' and specifiers' preferences; complexity of the project; local sectional or regional custom and usage; legal restrictions and union trade jurisdictional agreements.

The document is available to CSI members for \$2.00 and to non-members for \$2.50.

#### KEYNOTE SPEAKER

Robert J. Oster, senior economist, Southern Division, Bank of America, has been announced as the keynote speaker for the Institute's 15th annual convention. As the economist in the Bank of America's Los Angeles headquarters Oster specializes in business forecasting, asset management and corporate finance. His address before the convention is expected to deal with the changes occurring within the construction industry which have taken place as a result of industrialization and automation; the changes necessitated by the production demands and the technical innovations of our society.

MARCH-APRIL, 1971

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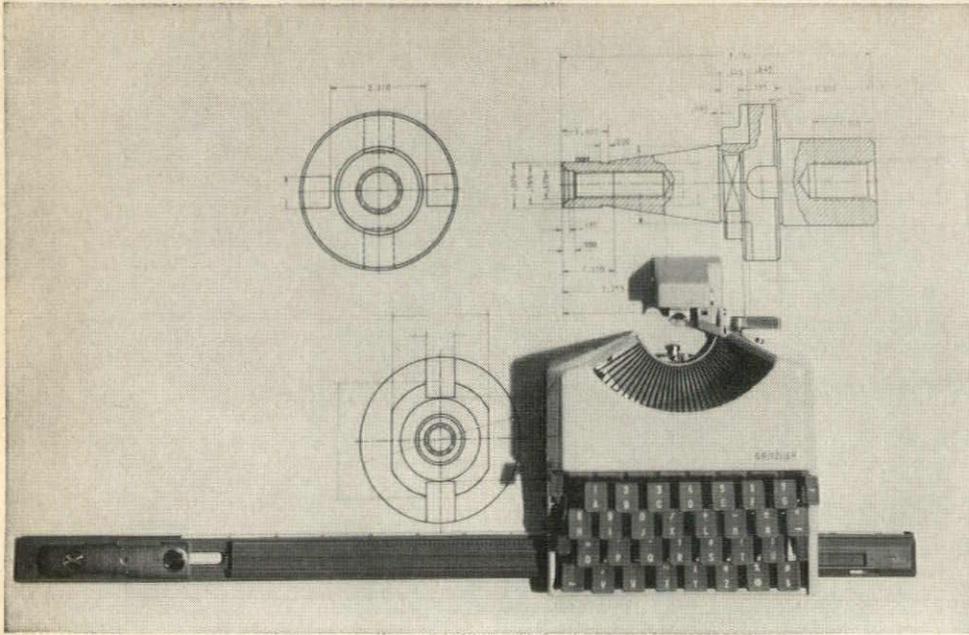
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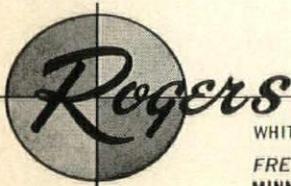
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### Earl Craig

(Continued from Page 113)

"I suppose it is not inappropriate for me to talk about the system of education which I think is probably one of the most destructive institutions in American society. **One of the major myths about the American educational system is the myth of the melting pot, the myth that all you have to do is get a good education and you can make it.** This has really never been true in American society; it has never been true because the ability to make it for the majority of people is related more to the social-economic status of one's parents. . . . I would suggest that the educational system is also destructive . . . because it functions essentially to mold students into a certain set mold. We figure we have certain criteria that all students must meet. . . .

"Charles Silverman, former editor of Fortune Magazine, in 'Murder in the Classroom' lists incident after incident where the educational system is primarily functioning to isolate the student from himself and the world. . . . The tragedy of that kind of policy is that it can't work. . . .

"I can't say that it is going to be an easy task to change. There are major problems in terms of the fact that teachers aren't very much involved in determining the education either and parents aren't involved and students aren't involved. . . . It seems to me that we not only need more money for education and we not only need to have better teachers but we need to fundamentally re-evaluate what it is the educational system can do and should do.

"Lastly, I think we see great disenchantment with political institutions. . . . I remember saying in a speech—and I still believe it—that we often say . . . there is such political apathy among black people and that if we could get them involved we would have a tremendous amount of power. Then I began to think, why should people be involved in a process that has little relationship to their lives and in which they have little chance to have any effect upon, being 10 or 20% of the population. . . . I think

NORTHWEST ARCHITECT

we have to deal with the reality of people's perceptions about where they can have an impact and I think it is a very real problem in our society that more and more and more people do not believe that the political and other economic and religious institutions are not relevant to their lives. . . .

"During the 50's and early 60's in this country the liberal kind of rhetoric said that we need to move to a point where you don't see a man as black or white or Indian or Chicano or Puerto Rican, that we have to move to a point where we don't see racial differences, don't see religious differences. I think we need to reject that kind of thinking because there are racial differences, there are cultural differences, there are historical differences and to go along myopically trying to create the situation as though there were no differences makes producing racial harmony within a society more difficult than recognizing the differences and recognizing the positive value of those differences . . . and moving from that point to building a multiracial society. . . .

"I think we need to admit . . . that expertise and professionalism has limited utility in decision making. . . . We ought to feel that we can involve nonprofessionals with us in decision making. That's going to be difficult, not only because of the humanity involved but because of the kind of decisions we are going to be making. . . . We need to give people a sense that they are a meaningful part of the decision making in those major institutions that affect their lives, whether that's a school, urban renewal project, church or the job or whatever it may be. . . .

"If we don't take this direction and people move further and further away and become more and more alienated, the possibilities of survival, it seems to me, are much more dim. In conclusion let me say that I think we need to realize that it's going to be risky but that we need to take the risk involved in challenging old assumptions and need to take the risk involved in widening and broadening the arena of decision making."

MARCH-APRIL, 1971

## Area Notes

(Continued from Page 86)

"Reuther Village," would contain 346 one- and two-bedroom apartments. . . . The new sales and service facility for the Eau Claire Book and Stationery Co. in Watertown is being designed by **Owen Ayres and Associates** of Eau Claire. The structure will include various activities now located in other cities to centralize handling of the business and one of its features is a 10,000-square-foot carpeted and air conditioned display room.

## SOUTH DAKOTA

Bids have been accepted for various construction phases of the new Harry V. Johnston American Indian Cultural Center to be constructed at Eagle Butte. **Aukerman and**

**Mazourek and J. T. Banner and Associates** of Rapid City are the architects. . . . Final plans are being drawn by **Herges, Kirchgasser and Associates** of Aberdeen for an addition to Marshall County Memorial Hospital in Britton. Such an addition had been considered when the original structure was built and mechanical facilities were then installed to care for the additional needs for heat, cooking, etc.

Development of an educational complex for the Gettysburg school district is being planned by **Herges, Kirchgasser and Associates, Architects**, of Aberdeen, the structures to include educational and gymnasium facilities. . . . Lakeview Terrace Apartments, a housing project for the elderly, are under construction in Chamberlain. The architects are **Koch, Hazard and Associates of Sioux Falls**. The apartments will be in three two-story buildings. . . .

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## PC AND AIA PLAN CONFERENCE AND EXPOSITION

With one eye on a rapidly changing construction industry and the other on the emergence of the building team as a dominant influence in the construction industry of the future, the Amer-

ican Institute of Architects and the Producers' Council have announced plans for a major National Conference and Exposition to serve the non-residential construction market.

It will be held in Detroit's Cobo Hall, June 21-25, with the conference running a portion of the first

two days. More than 150 exhibits are planned and a total audience range of 5,000 to 7,000 is anticipated.

Robert F. Hastings, FAIA, institute president, and Robert B. Darling, council president explained the action as a positive move to accommodate the changes occurring in the construction process and to provide an annual gathering place for all members of the building team.

The Conference will deal with subjects such as construction management, single design/construct and turnkey construction, performance specifications, systems and interface problems, labor, and other areas of management affecting the building team.

Invitations will be extended to all architects, including non-AIA members, engineers, contractors, owners, school administrators, hospital administrators, government officials and manufacturers. Initially, the conference and exposition will be held in conjunction with the annual AIA convention. Later, as it grows, it is expected to assume its own identity and meeting dates.

Registration for the conference is being handled by Producers' Council, 1717 Massachusetts Ave., N.W., Washington, D.C. 20036.

## AISC ENGINEERING CONFERENCE AND AWARDS PROGRAM ANNOUNCED

The twenty-third Annual National Engineering Conference sponsored by the American Institute of Steel Construction will be held in Cleveland on May 6 and 7.

"Designing for Today and Tomorrow" is the continuing theme of this symposium and this year the emphasis will be on fire protection of structural steel, new de-

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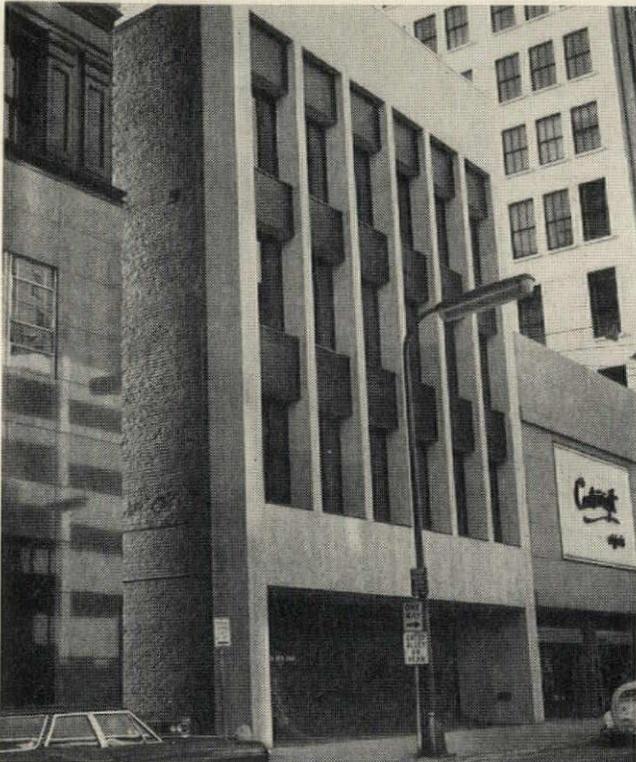
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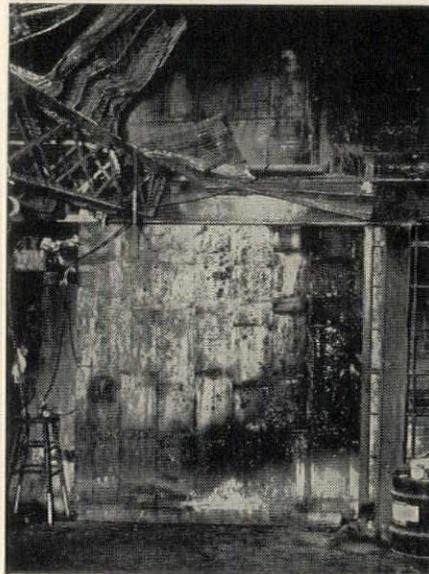
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The AISC also has announced its 1971 Prize Bridges Competition, the 43rd year in which the institute has sponsored this competition. Any steel bridge located within the United States, and which was completed and opened to traffic during the calendar year 1970, is eligible for entry. Submissions must be post-marked prior to June 5.

Details of the conference and the awards program can be obtained from the American Institute of Steel Construction, 101 Park Ave., New York, N.Y. 10017.

### TWO SHIELY RETIREES HAVE COMBINED 97-YEAR RECORD

Honored at a recent luncheon were two well-known employees of J. L. Shiely Company, who had amassed a combined total of more than 97 years of service when they retired.



James "Jim" Halek, who drove a team of horses when he started in 1921, had a work record of more than 49 years when he retired as a loader operator. During his years of Shiely service he had also operated a variety of other equipment, in addition to serving as a foreman, superintendent and supervisor of plant maintenance. He also did the first testing at the sand and gravel plant on Grey

Left to right are Mr. Zarbinski, Mr. Halek and Mr. Shiely.

Cloud Island and in other areas.

Isadore "Benny" Zarbinski drove a Ford Model A pickup truck with a surrey-like top when he began work in 1923. He subsequently worked on cranes, shovels and drag lines in the St. Paul area and out of the state on such projects as the Garrison Dam. His son, Jerry, operates the huge shovel on Grey Cloud Island.

"Both Benny Zarbinski and Jim Halek have been the kind of loyal, conscientious employees that any employer would be proud and pleased to have," J. L. Shiely, Jr., said. "They are typical of the people who have helped make the J. L. Shiely Company successful."



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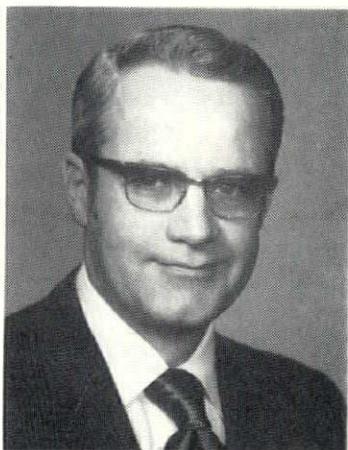
Elected president of the Builders Exchange of St. Paul at the 71st annual meeting was Edward T. Kolar, president of Edward T.

NORTHWEST ARCHITECT

Kolar & Co., mechanical contractors. He succeeded Fred R. Aichinger of the general contracting firm of Aichinger & Green Construction Co.

Other officers elected at the meeting were Vice-pres. Thomas H. Klein of Metcon, Inc., and six new directors, Sherwood D. Jensen of Wm. Poppenberger & Son, Richard M. Kehne of Kehne Electric Co., Robert V. Kochendorfer of Northwestern State Bank, Thomas C. Mackin of D. W. Hickey & Co., Lindor A. Melquist of Steenberg Construction Co., and Gerald A. Person of Dale Tile Co.

#### MINNEAPOLIS BUILDERS ELECT STANLEY



Charles C. Stanley, president of Stanley Iron Works, was elected president of the Minneapolis Builders Exchange to succeed H. E. Fraser, president of Langford Electric Corporation.

Other officers elected by the board of directors are John C. Hustad, Jr., vice-president of The Hustad Company, as first vice-president, Robert F. Nystrom, president of Nystrom Construct-

ors, second vice-president and William C. Porter, president of Belden-Porter Co., treasurer. Enoch N. Peterson is secretary and general manager of the 750-member organization.

Two directors elected at the annual meeting are Richard B. Brown of Insulation Sales Company and Eugene Grazzini, Jr., of Grazzini Bros. & Co.

#### CONTRACTORS AND UNIONS JOIN IN CERAMIC TILE PR WORK

To assure that ceramic tile retains its historic place as a quality architectural surfacing system, the nation's tile contractors and the craft unions representing tile-setters and in some areas tile-helpers are joining in a nationwide information program.

The overall program includes efforts to be undertaken both nationally and regionally. The national campaign will integrate and reinforce the regional efforts, providing an umbrella under which they will be more effective and useful.

The national program is being sponsored by the National Ceramic Tile Promotion Fund, whose president is John P. Wallner of Drake Marble Co., St. Paul. On the regional level direction and financial control will be exercised by regional promotion-fund organizations.

"In a prefab age," Wallner commented, "people tend to forget that durability and maintainability—not to mention the distinct aesthetic advantage of tile—can be even more significant over the long term than the cheap initial costs of plastics and other substitutes.

"There are many people, even in the construction trades, who don't fully realize how contemporary ceramic tile is. We can compete with substitute systems in terms of installation speed and costs. All these people need is accurate information, and they'll come to prefer tile. We intend to provide them with such information."

The program has the full backing of Thomas F. Murphy, president of the Bricklayers, Masons & Plasterers International Union of North America (AFL-CIO), which represents the nation's tilesetters.

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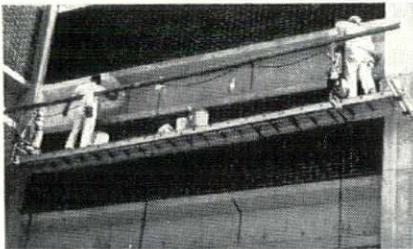
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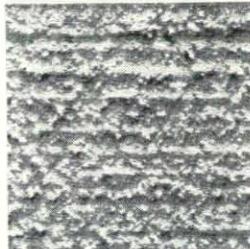
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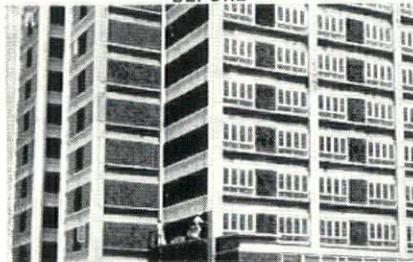
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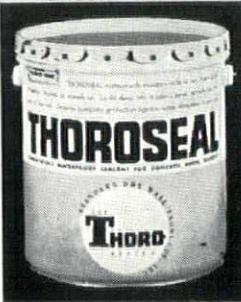
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Two brush coats of THOROSEAL were applied over poured concrete walls to completely fill and seal all voids, making the surface attractive, thoroughly waterproofed, finished economically—no rubbing necessary. And, to secure a firm bond, ACRYL 60 was added to the mixing water (1 part to 3 parts water) for extra strength, a lifetime of wear.

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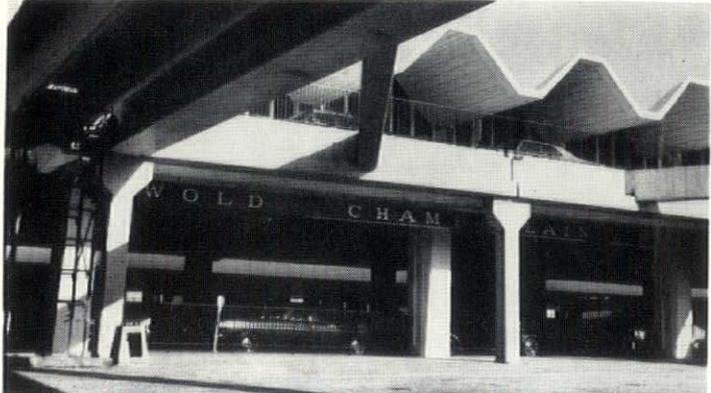
NORTHWEST ARCHITECT

# SPECIFY STRENGTH



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Strength was essential in constructing the Center Parking Deck for Twin Cities International Airport in Minneapolis. That's why Prestressed Concrete was specified in the building plans. With a total ramp area of 300,000 square feet and bay areas of 63 feet by 30 feet, the architects, the Cerny Associates, Inc., of Minneapolis wouldn't settle for anything less than Prestressed Concrete. The ramp required 450 Prestressed double tees, 206 Inverted T beams, 36 rectangular beams and 191 columns. All of the Prestressed materials were fabricated at Prestressed Concrete's casting facilities and delivered to the construction site as needed.



The backbone of the ramp consists of these double-T, beam and column framing materials.

**PROJECT:** Center Parking Deck for the Minneapolis, St. Paul Metropolitan Airport Commission — Wold Chamberlain Twin Cities International Airport.  
**ARCHITECT:** The Cerny Associates, Inc., Minneapolis  
**CONTRACTOR:** Watson Construction Co., Minneapolis  
**STRUCTURAL ENGINEER:** Intertec, Inc., Minneapolis

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### Harold Hanson, John Thoeny, Bob Beltz.

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How are they kept so clean? It's simple. Men like Harold Hanson, John Thoeny and Bob Beltz have pride in their machines. Harold, John and

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