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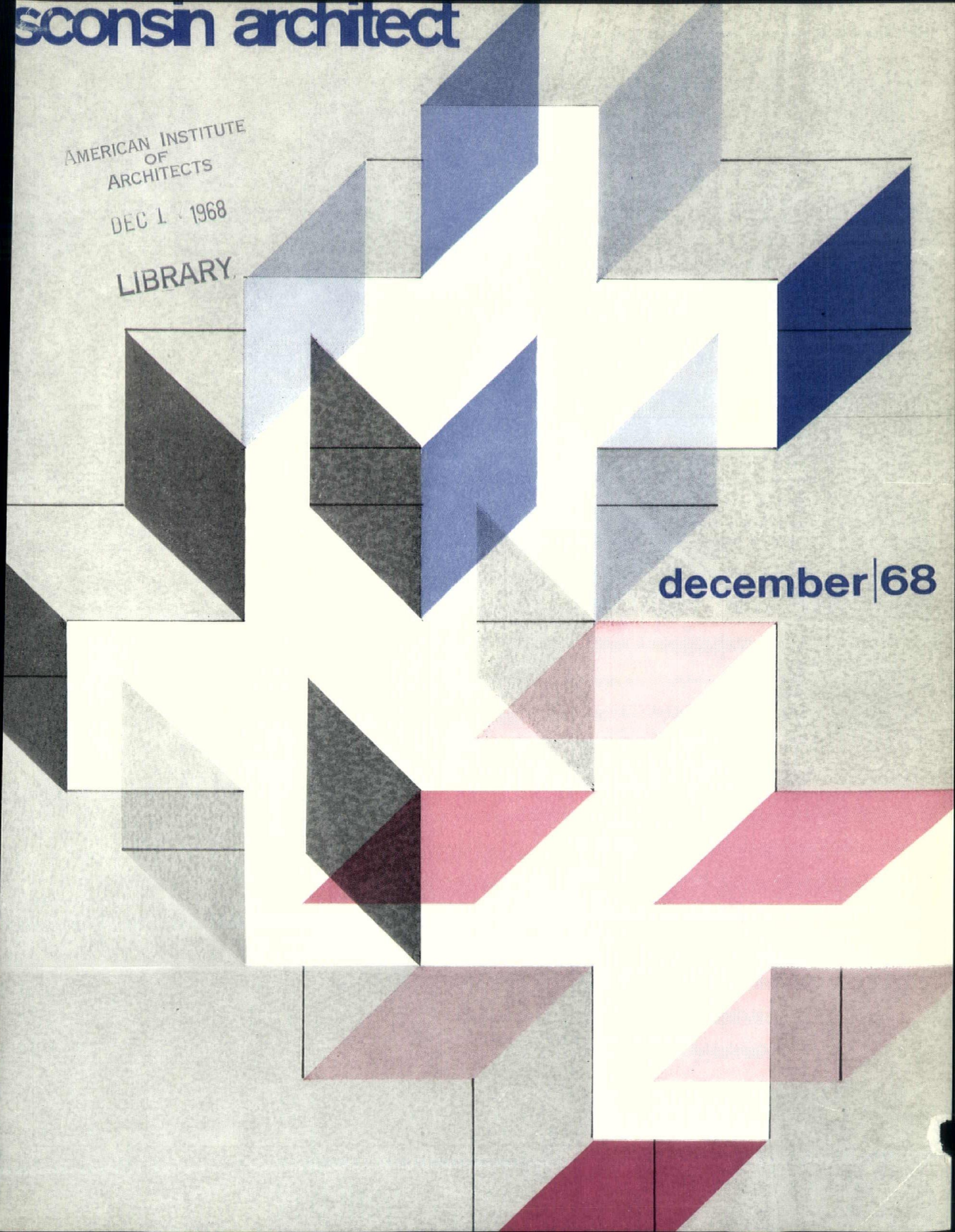


december|68

Concreting in cold weather

Table 1. RECOMMENDED CONCRETE TEMPERATURES FOR COLD-WEATHER CONSTRUCTION**(air-entrained concrete)*

Line	Condition of placement and curing		Thin sections	Moderate sections	Mass sections
1	Min. temp. fresh concrete *as mixed* for weather as indicated, deg. F.	Above 30 deg. F.	60	55	50
2		0 to 30 deg. F.	65	60	55
3		Below 0° deg. F.	70	65	60
4	Min. temp. fresh concrete *as placed*, deg. F.		55	50	45
5	Max. allowable *gradual* drop in temp. throughout first 24 hours after end of protection, deg. F.		50	40	30

**Adapted from Standard Recommended Practice for Cold Weather Concreting (ACI 306-66), American Concrete Institute.*

Table 2. RECOMMENDED DURATION OF PROTECTION* FOR CONCRETE PLACED IN COLD WEATHER**
(air-entrained concrete)

Degree of exposure to freeze-thaw	Type I or II cement	Type III, accelerator, or extra-bag cement
No exposure	2 days	1 day
Any exposure	3 days	2 days

**Protection for durability at temperature indicated in line 4, Table 1.*
***Adapted from Standard Recommended Practice for Cold Weather Concreting (ACI 306-66), American Concrete Institute.*

Basic guides for winter concreting

1. Plan in advance. Have equipment and materials ready before cold weather arrives. Provide heaters, insulating materials, and enclosures.

2. Use air-entrained concrete.

3. Don't place concrete on frozen subbase. Be sure that all ice, snow and frost are removed from surfaces the concrete will touch.

4. For durability, the concrete should be kept at the temperature shown in line 4 of Table 1 for the period of time shown in Table 2. Consider using high-early strength concrete.

5. Cure concrete to prevent loss of moisture. When heated enclosures are used, provide extra moisture by sprinkling or use live steam for heating. Vent salamanders and other fuel-burning heaters.

6. Do not allow use of so-called antifreeze compounds in an attempt to lower the freezing point of concrete.

7. Leave forms in place as long as job schedules permit. Reshoring is necessary until concrete reaches required design strength.

8. Keep job condition records. Record, at least twice daily: weather conditions, temperatures of the air around the concrete, and the concrete surface.

9. Don't use water reducers or retarders if concrete is to cure below 60° F.—they may prolong the set.

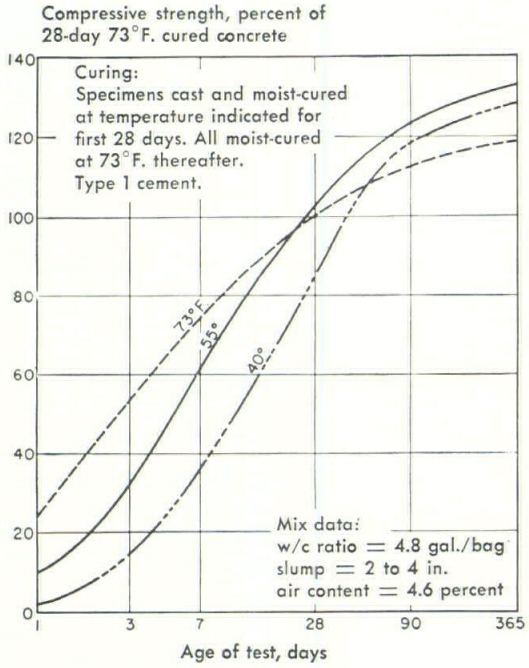
10. The use of calcium chloride or admixtures containing soluble chlorides is *not* recommended under certain conditions:

a. In prestressed concrete because of the possible corrosion hazards.

b. In concrete containing embedded aluminum (e.g., conduit) since serious corrosion of the aluminum can result.

c. Where galvanized steel will remain in permanent contact with the concrete.

d. In concrete subjected to alkali-aggregate reaction or exposed to soils or water containing sulfates.



Effect of low temperatures on concrete compressive strength at various ages.

Write for free informative literature on cold-weather concreting.

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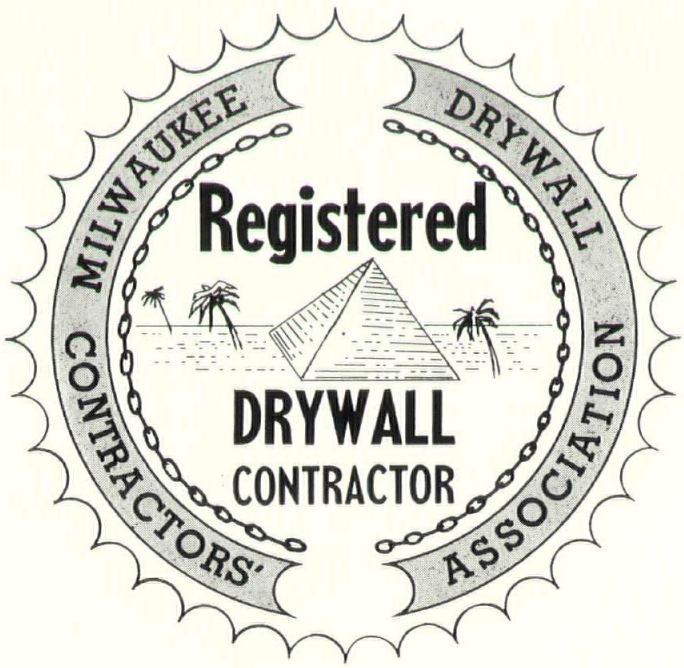

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wisconsin architect

Volume 39, No. 12 december/1968

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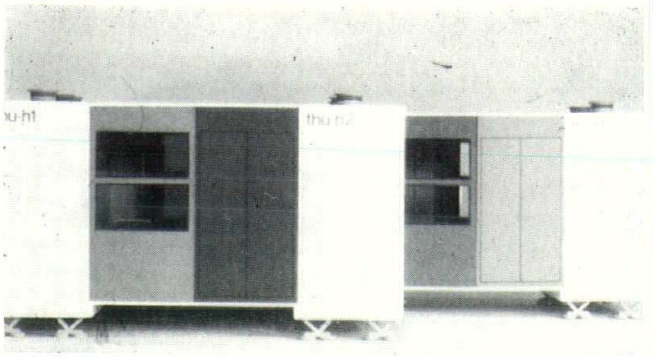
This issue contains three articles, all of which were presented at this year's National AIA Architects Researchers Conference in the Wisconsin Dells. (The Conference was briefly reviewed in the Nov. '68 Wis. Arch.)

We believe that these three articles offer an excellent insight into the scope, the variety and the extent to which today's architects are involved in finding solutions to the critically chaotic situation of our time.

RALPH WARBURTON, *AIA, Special Assistant to the Secretary for Urban Design, Department of Housing and Urban Development, gives an overview and specifics of the extensive governmental involvement in "today's most important national issue, a decent home in a suitable living environment for every American family."*

GUNTER SCHMITZ, *AIA, Associate Director, Research and Graduate Center, School of Architecture, Texas A & M University, presents the Relocatable Health Unit System concept, a major contribution by "architectural research in various environmental problem areas of major social and economic significance."*

NORMAN M. KLEIN, *AIA, of the firm of Skidmore, Owings & Merrill, Director of Design, Baltimore Concept Team, presents the efforts of an interdisciplinary team of giving "that variety of options which can give the community a significant choice over the kind of future environment it will live in."*



Relocatable Health Unit Systems

by
Gunter Schmitz
Associate Director
Research and Graduate Center
School of Architecture
Texas A&M University

To contribute to the alleviation of severe health problems plaguing the world's developing countries, the first phase of a research and development project for relocatable minimal health units was conducted at our Research and Graduate Center of the School of Architecture at Texas A&M University. This Center, since its origination in 1963, is performing architectural research and development in various environmental problem areas of major social and economic significance. Its research projects involve research architects, architectural graduate research assistants, and various selected consulting experts from inside and outside the University. The projects are of an applied rather than a basic nature and are structured toward the achievement of realistic products as end results. A fundamental premise, and one which characterizes all operations of the Center, is that through the application of rational methods and contemporary technology — successfully proven in other technical areas already — progressive innovative results within architecture and the building field can be accomplished.

The project was sponsored by the American Iron and Steel Institute with an emphasis on the development of integrated lightweight steel construction.

The U.S. Agency for International Development in Washington, as an additional supporting group, originally expressed to the Center the need for a relocatable minimal clinic to be used in underdeveloped areas of Southeast Asia. It was soon felt, however, that the original idea should be broadened toward the more comprehensive concept of an adaptable system of transportable minimum health units serving as medical outposts for civilians in developing countries all over the world. Additional investigation expanded the original objectives even further to include use in disaster areas as well.

The project involved eight half-time graduate research assistants of various backgrounds paid by traineeships of the U.S. Public Health Service, the U.S. Agency for International Development, and by University assistantships. The team was directed by myself. The time period available covered six months from September, 1967 to February, 1968.

The work itself was carried out in five main steps. The first necessarily became a period of familiarization with obvious problems of developing countries and disaster areas. Actual conditions and needs of developing countries (climatological, socio-economic, and health aspects), disasters (types, severity, and aftereffects), and existing transportable units (technical aspects) were covered by a comprehensive survey. The results of these initial considerations led to step 2, the problem statement. With step 3, the team attempted to establish basic principles for a mobile health unit considering various approaches, configurations, and supportive systems. The development principles then were refined and narrowed to four possible mobile health unit concepts in step 4. By further restriction of possibilities, integration of certain principles, and introduction of new characteristics, two tentative solutions were finally developed in step 5. One solution represents a containerized system of highly transportable sub-units which can be combined in various configurations, increasing their usable volume considerably. The other solution, a self-propelled and self-contained expandable unit, can be optimally utilized for revolving health services or disaster relief purposes. This unit, too, can be interconnected for efficient functional space utilization.

The concepts of both tentative MHU solutions had been thoroughly studied in sketches, drawings, and three-dimensional models before their physical shapes were finalized.

The project was developed by a combined team effort. Sub-teams of two to four members worked according to actual requirements and stages of the de-

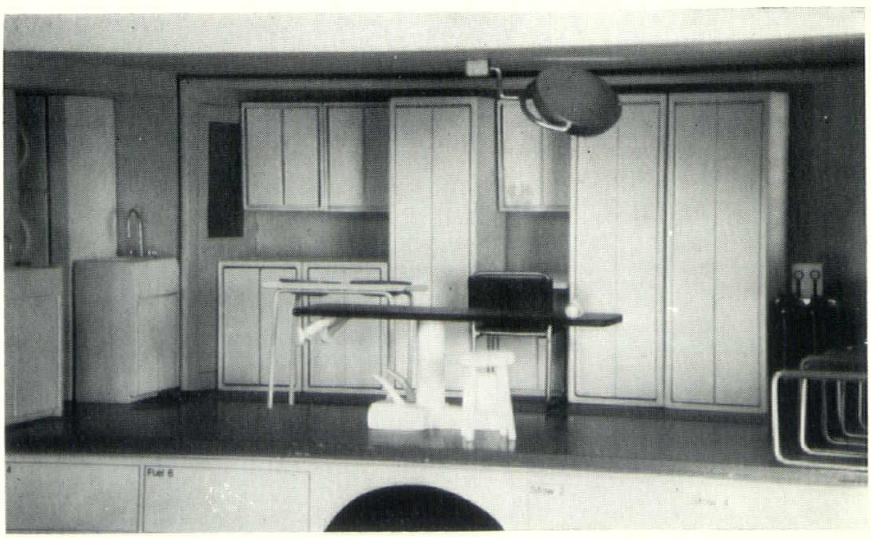
velopment as well as to self-motivation and personal preferences. Continuous regrouping of the team members in the sequence of the work process stimulated ideas and insured optimal work efficiency.

The team itself was multi-disciplinary, composed of architects, a hospital administrator, a registered nurse, an industrial educator, and a business administrator. With these diverse backgrounds, a broader overall perspective, in addition to the expertise of the detailed elaborations in the specific field, was achieved throughout the whole research and development process.

The objectives of the project, as stated before, were determined only after a comprehensive surveying phase. Among others, the list of objectives included: The system should serve various medical uses, but mainly basic diagnostic, curative, and preventive purposes. The unit should serve as a mission oriented system to adjust staff and medical relief measures to various situations and number of patients. It should adapt to numerous conditions of the environment, that means varied environmental capabilities, climates, local customs, surroundings, and duration of stay. It should have a neutral or even humane, non-repellent physical appearance to local populations. The design of the unit should consider economy of material and processes, and the effect of climate and deterioration on materials. Multipurpose, compact components with simplicity of design and modular unity should facilitate fabrication and assembly. Highly specialized parts and new processes should be minimized in favor of use of stock items and well-known production techniques. The system should be immediately marketable with a potential of continuing production. The mobile health units should be transportable by air, land, and water. Transport packages should fit conventional carriers. The dimensions should require a minimum of special permits for movements. Besides being able to be lifted by helicopter, the units should be capable of movement from a few feet to thousands of miles. The assembly process should be a simple, easy system of pre-assembly or on-site assembly not requiring highly trained personnel. The contents, equipment, furniture, etc., should be protected from elements during assembly or disassembly. The units should permit an easy maintenance, cleaning, and decontamination, especially when moving to a new site. Parts should be standard or simple enough for easy repair . . . etc.

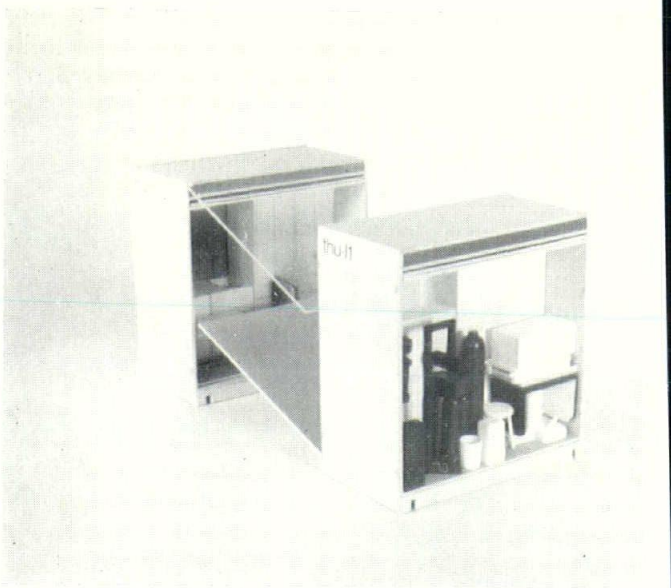
With these and many other objectives in mind, several design concepts had been developed and finally evaluated. In order to achieve some objectivity in the otherwise subjective process of evaluating the tentative mobile health unit concepts, a factor rating was used as a basis of comparison to the stated objectives. The six major objectives and their sub-objectives were decimally rated as to their agreed importance. After finding out each concept's relative compliance to the objectives, special aspects of each concept were discussed and a decision was reached to develop two tentative design solutions, one by combining the characteristic advantages of three concepts, the other by evolutionary redesign of another concept.

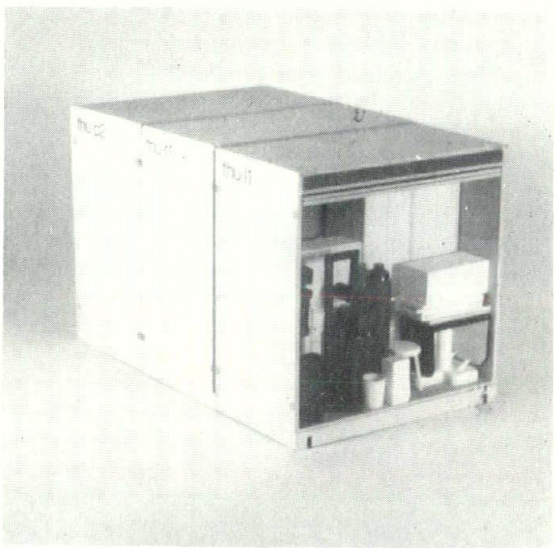
Transportable Health Unit

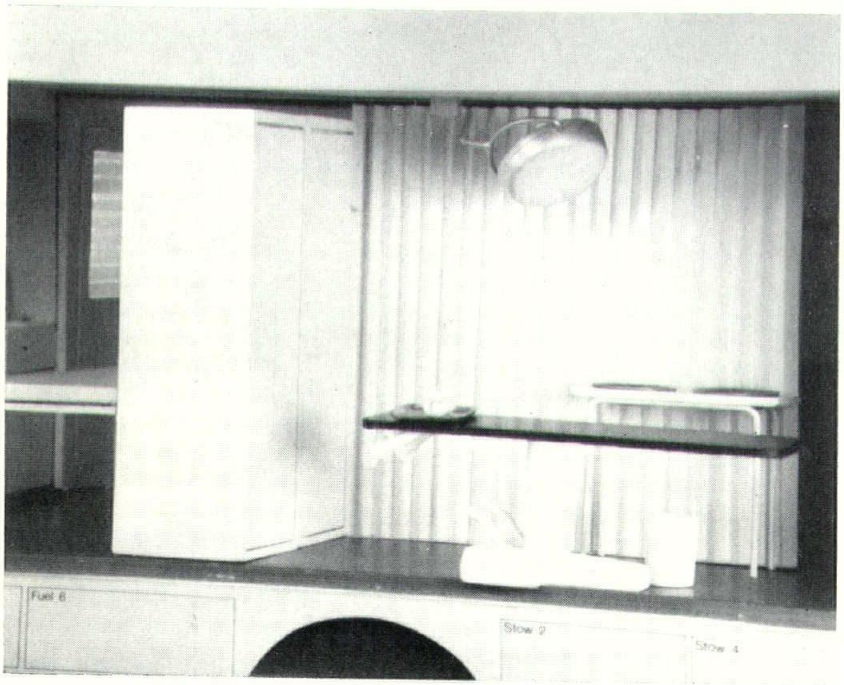


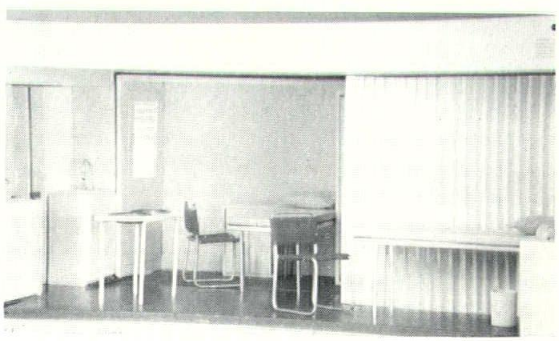
The first tentative solution became a system of coordinated structural units which can be assembled and combined according to various functional uses. Each unit is a rigid box frame ring in lightweight sandwich panel construction, 4′ deep, 8′ wide, and 8½′ high. The inner space of this basic structural ring is closed by two 8′ x 8′ hinged panels, swinging outward up and down in opposite directions. Into each structural frame a number of permanent fixtures are integrated, e.g., air-conditioning, lighting, piping, and wiring. The mechanical services thus become decentralized into several nodal points all over the Health Unit. Movable equipment like cabinets, medical items, supplies, power sources, hygiene components, beds, furniture, etc., can be packed inside the basic structural units for transportation. So each transport unit is pre-equipped with

a specific set of functional equipment according to its future use. Five different types of basic units are distinguished, coded with outside markings to facilitate identification and administration. They can be combined and arranged in various ways to create functional spaces ranging in size from a first-aid station to a small clinic to a modest ward hospital. Appropriate volume and relative lightweight of these basic containers guarantee an easy handling by all regular modes of transportation (road, railroad, ship, cargo plane, and helicopter). Besides their function as transport packages and decentralized mechanical service cores, the basic units also serve as structural support members. In their final destination site, the containers are properly spaced in 8′ intervals, which easily can be done by use of the 4 height-adjustable "walking" foundation jacks. After the hinged panels are opened and interconnected to the opposite structural unit to form the floor and roof structure, the side panels (doors and windows), transported

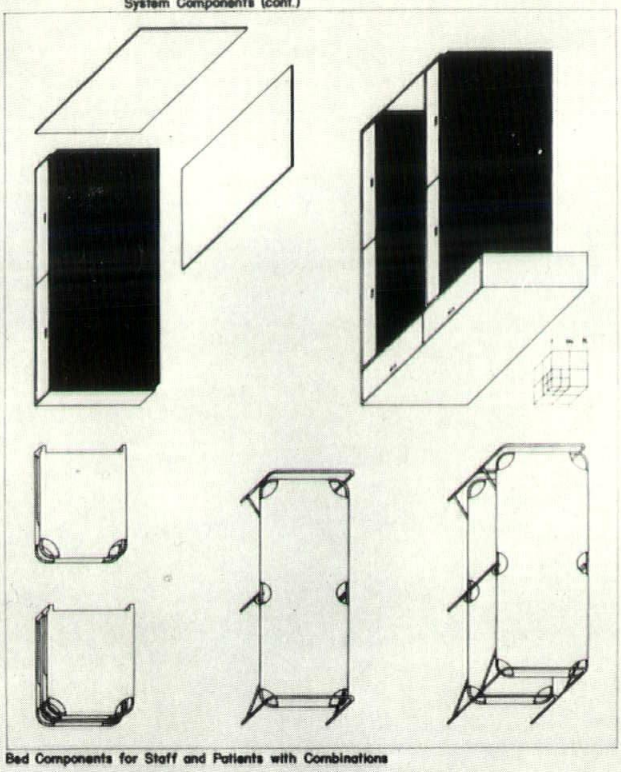






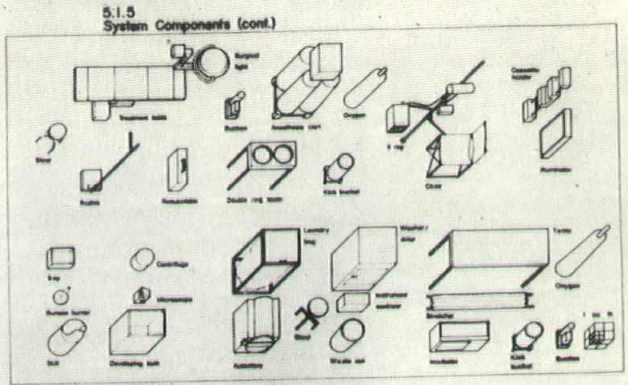


5.1.5
System Components (cont.)

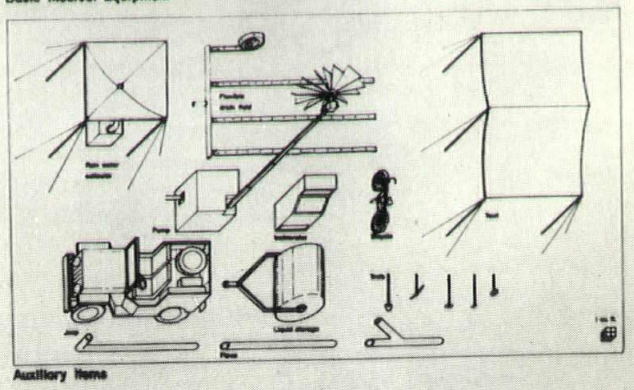


Bed Components for Staff and Patients with Combinations

5.1.5
System Components (cont.)

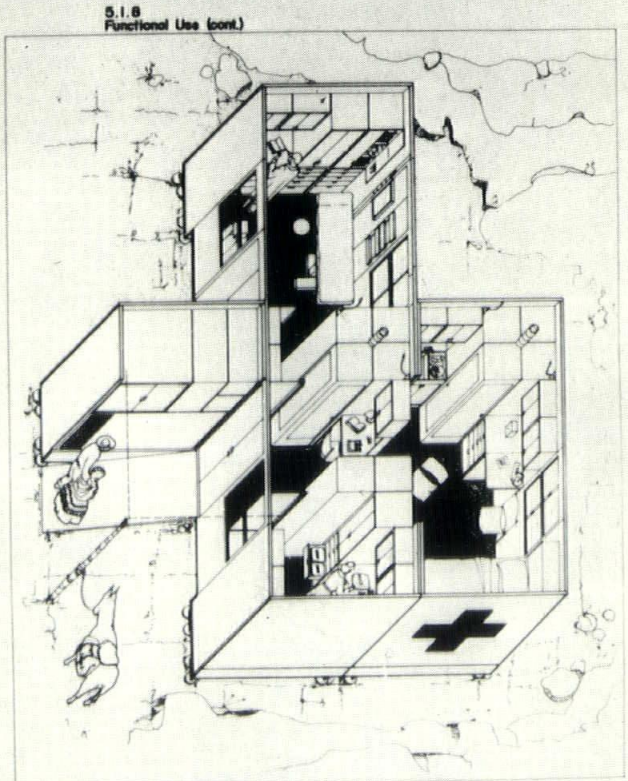


Basic Medical Equipment



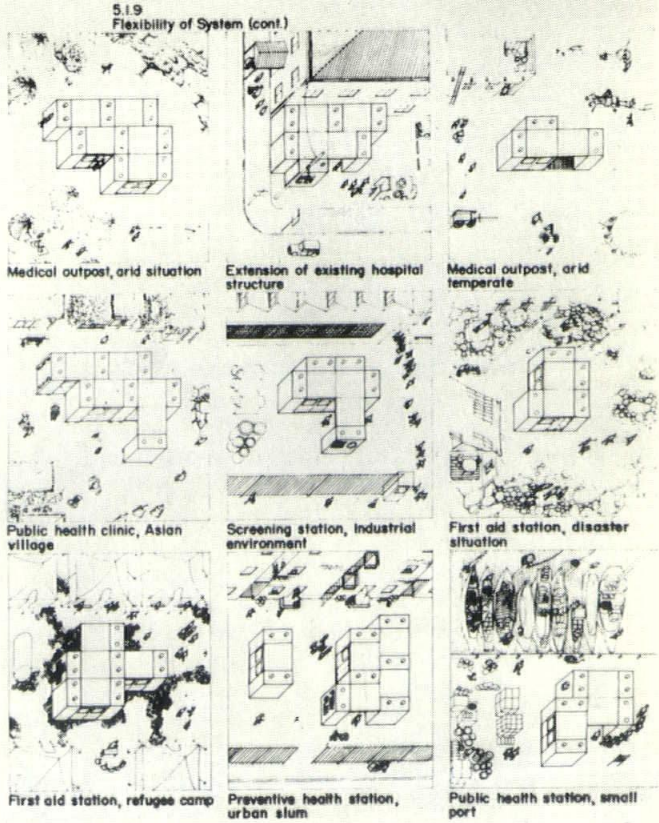
Auxiliary Items

5.1.8
Functional Use (cont.)



A minimum functional unit consisting of six basic structural packages

5.1.9
Flexibility of System (cont.)



Medical outpost, arid situation

Extension of existing hospital structure

Medical outpost, arid temperate

Public health clinic, Asian village

Screening station, industrial environment

First aid station, disaster situation

First aid station, refugee camp

Preventive health station, urban slum

Public health station, small port

tween floor and ceiling. The actual space increase of the assembled units from transport condition to the operational condition amounts from 100 percent to 150 percent depending on their number and configuration.

Flexibility in use, compact transportability and space increase are the major assets of this system for relocatable health units. Its adaptability makes it particularly suited for medical outposts for a population which is in need of medical attention in underprivileged regions, in developing countries, or in areas marked by dynamic sociological change as interim solutions to overcome acute health needs. A secondary application of the system will be a medical relief measure for certain disaster areas. With the easy transportability of the units, the system can be distributed worldwide to fit a variety of specific needs. It can grow and change in small increments as the health needs of the area differ with time. In brief, the developed solution represents a highly adaptable system for Transportable Health Units.

Auto-Mobile Health Unit

The tentative second solution represents a self-contained, self-propelled health unit. When expanded, the Auto-Mobile Health Unit increases its usable space by 88%. The mobility of the unit makes it effective for rotating health services in developing regions and for use in disaster areas where short arrival and set-up times are vital. Although its primary means of transportation is self-propelled by road, the Auto-Mobile Health Unit can also be transported worldwide by freight train, ship, airplane, and helicopter. The unit consists of a standard truck chassis, suspension and steering mechanisms, and motor (also used as power source for mechanical, electrical, and air-conditioning equipment), front, side, roof, and floor panels (custom-made of lightweight structural sandwiches), telescoping expansion members which slide on a phenolic base, and a ceiling system which incorporates plumbing, water storage, lighting, and air-conditioning.

The standard unit is equipped with built-in facilities such as a toilet/shower area and optional sinks, washer, dryer, and autoclave. A countertop, refrigerator, and range are available as substitutes for these equipment items. There are also various movable mechanical utilities, modular cabinets and miscellaneous equipment safety-packed during transportation and ready for use with minimal reassembly and rearrangement. The Auto-Mobile Health Unit has wide flexibility of interior activity areas and can be arranged to perform almost any basic medical function. One single unit can provide a minimal examination/treatment area, a laboratory, an administration area, a cleaning/sterilizing area, as well as a living/sleeping area for one or two persons. These areas can be expanded by interconnecting two or more units each housing only one or two of the basic functions as well as nursing and health education spaces. An integrated configuration of Auto-Mobile

Health Units might consist of one unit housing laboratory and administration, one unit housing living/sleeping for four persons, one unit housing two examination/treatment areas and reception, one unit housing a major surgery area and preparation area, one unit housing a health education area, and one unit housing a six-bed ward.

The two tentative solutions for relocatable minimal clinics were exhibited at the Texas Hospital Association Convention in Dallas, May, 1968. Other exhibits included the American Hospital Association Annual Convention in Atlantic City, New Jersey, September, 1968. The two systems were also presented at the June, 1968, AIA/ACSA Teachers' Seminar in Montreal, Canada, as examples of architectural development work in industrialized component systems. First responses are encouraging and contribute to the Center's current administrative efforts to raise further funds for a second development phase to improve the two concepts, to elaborate technological details and answer open questions in the human engineering field by full-size mock-ups, to supervise construction of two prototypes as the only basis for realistic cost estimates, to quantify precisely the potential market, and to promote ultimately, the production and distribution of the units.

This Mobile Health Unit project clearly is marked by major humanitarian aspects. There is growing evidence that the higher developed economies will eventually realize their true responsibility toward the underprivileged nations. They definitely will have to help these developing nations to help themselves. One important aspect in giving these regions their badly needed medical attention is the provision of an efficient system of basic health units, however, on an immeasurably bigger and more imaginative scale than is generally practiced now.

The deployment of the Mobile Health Units, of course, has to be organized and responsibly planned. Pre-evaluation of the particular local condition is required to determine the actual needs of an area in terms of quality and quantity of units, equipment, supplies, staff and administration. The distribution, rotation, expansion or replacement of the units, equipment, and staff, as well as an efficient buying and warehousing, decentralized geographically for easy distribution, has to be maintained under some central control for constancy. It has to include the rotation of perishable medical supplies with a hospital or medical facility to maintain freshness and potency. A suggestive, or authoritative, transport control has to determine the most efficient use of all modes of transport, including local modes. The most effective rental, lease, or sales provisions have to be found for each use. Manuals, written in simple language, have to provide assembly, maintenance, and use instructions. Personnel management will be implemented through consistent policies, but special consideration will be given to the utilization of local personnel. The familiarization with the local habits and customs of the area of use before entering it, is essential. Distribution, rotation, replacement, resupply, evaluation, buying, warehousing, rental, sales, leasing, training, promotion, and self-evaluation will be part of a records system. The records also include an interrelated accounting, costing, and inventory system, with a payment control. In an ideal situation, all deployment aspects could be integrated and tied to a computer. The central should be preferably part of a national or multi-national organization, either existing or original. A further tie-in with a national or regional medical or emergency relief program is highly advisable.

It is imperative to emphasize that both systems are merely instruments to deliver health services and preventive health education for people who most urgently need basic health help, and all activity regarding the two relocatable Health Unit Systems should be ultimately directed toward this end. Right now, little can be said about the actual production of these Minimal Health Stations. It appears logical that only a higher developed economy with an appropriate advanced industrial capacity will be able to produce the units rapidly enough in a sufficient number and reliable quality.

The chances for direct application of the developed systems in this country alone are challenging enough. As an initial result of first promotion efforts, the range of agencies or institutions extremely interested is as diversified as the Bureau of Indian Affairs, various hospital extension services in extreme rural areas, e.g. the Appalachians, or states with low-income urban high density areas, i.e. New Jersey.

But the number of underprivileged and disadvantaged is not only growing at an alarming rate in this the richest and most powerful nation on earth. Basic health needs abroad have to be attacked more effectively than before as well if the present increasing gap in the health status between advanced and underdeveloped economies should eventually be diminished. It is encouraging to learn that e.g. the reputable voluntary organization of the American HOPE Ship at the very moment is studying our two concepts very carefully as it sees the necessity to leave a number of adaptable mobile and semipermanent health installations with trained local personnel behind in the various countries after its mission is completed there.

Poverty regions of all kinds on earth could indeed represent one of the most urgent research objects for universities. Like many professions, the architects also too long have neglected this problem field. It ought to be found out how new facilities of all kinds, private and public, for health, housing, work, education, circulation, and recreation can be economically provided for the maximum number of people, in the shortest possible time, in an optimal environmental context. Architectural research and development in this area doubtless can become highly contributive if we only will learn to collaborate with other problem oriented disciplines. The little research and development health project, which I just had the pleasure to present to you, is an example how flexible systems for the efficient delivery of basic health services to such people can look like. I think we all are aware that adequate health is only a fraction of the total basic requirements these populations need, requirements which are perfectly justified if we presuppose that the humanization of this, our earth, is still the basic incentive of our work.

Design Research

by Ralph Warburton, Special Assistant to the Secretary for Urban Design
Department of Housing and Urban Development

Certainly we can all join in support of the Presidential and Congressional goal, and one of today's most important national issues, a decent home in a suitable living environment for every American family. This goal has both physical and social components.

On the physical side, we can ask whether good environment relates naturally to scientific achievements? Have advances in technology sparked simultaneous development of environmental quality? Have engineering projects on a large scale contributed to broad environmental improvement?

Well, for example, we have several ugly towns generated by atomic energy facilities. We also know, for example, of the parallel strands of work in the 1930's on plastics and on the concept of a one-piece bathroom unit, which were not brought together until the 1960's. And we know of the urban problems created by airports and highways, to say nothing of opportunities often missed when rivers are deepened or dammed.

Thus, in spite of science fiction images, we must conclude that technological progress has not often been related to good environment in the past; at least not in a timely way. That is not to say that there is no relationship. It does mean that well conceived and coordinated research efforts are needed to develop the technology-environment interface, in order to provide forward looking design back-up for the future.

This need is even more apparent in the socio-physical interface of architectural research, since the primary activity of sociologists thus far has been to study certain non-material aspects of society. The subject of "user needs" for environmental design represents a considerable vacuum at present. As a recent HUD-AIA seminar indicated, we need objective performance standards which are related to their positive effects on people.

There is a hopeful parallel with our space exploration experiments. Much effort has been expended to provide optimum environments for a few astronauts for several days. We must find the optimums for earthly environments that will continuonsly promote the ideal development of our society.

Can these environments be produced given the attitudes of citizens and officials and professionals involved in particular aspects of the development process. The answer to this question is yes, if all are willing and able to help bridge the gaps that separate ideas, and people, and ideas and people.

We at HUD believe that the solution of large and complex urban problems requires a comprehensive and energetic attack focused directly upon this important goal. With the Housing and Urban Development Act of 1968, we are rapidly approaching the point where a comprehensive array of governmental mechanisms is available.

To outline these historically, I would begin with the first component of the present Department, which was the Federal Housing Administration, whose initial activities in mortgage insurance programs were authorized in 1934 to assist families in purchasing their own homes.

In 1937, the public housing program was authorized to help provide housing for very low income households. Under this program, annual contributions are made to local authorities to defray the 40 year debt service on dwellings so that rent paid by the tenants generally represents only operating and maintenance expenses.

The next major program was authorized after World War II in 1949. Urban renewal assists localities in redeveloping blighted areas by helping write down the cost of land. Grants can be made up for to ⅔ of project cost.

In 1954, the urban renewal program was broadened, and the 701 program of comprehensive planning assistance was enacted.

The 221 (d) (3) program authorizing below market interest rates in moderate income FHA housing was enacted in 1961, and this was aimed at partially filling the considerable gap between public housing and middle income levels.

Special help was extended to the elderly in 1962.

In 1965, the Department of HUD was established and the rent supplements program was created to help poor families afford decent private housing.

In the Housing and Urban Development Act of 1966, the Model Cities program was born.

Model Cities is a program of programs, since it provides intensive block grants to cities who coordinate a wide variety of physical and social programs to meet the needs of a specific model neighborhood over a five year period. The planning process for Model Cities involves intensive citizen participation.

Also in 1966, President Johnson by Executive Order assigned to HUD's Secretary the leadership role in urban affairs, authorizing the Secretary to initiate cooperation between the various government agencies with programs affecting urban affairs.

The omnibus Housing and Urban Development Act of 1968 provides a new challenge to the field of design research with its introduction of many new programs which will fill in previous voids in Federal assistance to urban areas. Of considerable interest are the provisions of financial assistance to new town developers and to non-profit housing sponsors.

A principal thrust of this legislation is housing, with the declaration of a national goal of 6,000,000 new housing units for low-and moderate-income families in 10 years. This averages out to a six-fold increase in our current annual production of this housing — and nearly a 50% increase in the annual production of all housing!

Two major new assistance programs are provided: Section 235 (ownership) and Section 236 (rental)

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Mr. Warburton received a Bachelor in Architecture degree and the Skidmore, Owings and Merrill Traveling Fellowship from Massachusetts Institute of Technology. He received Master of Architecture and Master of City Planning degrees, and the William E. Parsons Medal in Urban Design, from Yale University.

A native of Kansas City, Missouri, he has been associated with design firms there, and in Boston and New York City. Prior to his present appointment, he was Associate and Chief of Planning with Skidmore, Owings and Merrill, Architects-Planners-Engineers, of Chicago. Among his major responsibilities was the Chicago Central Area Lakefront Development Plan, completed in 1966.

A licensed architect or community planner in four states and the District of Columbia, Mr. Warburton holds memberships in the American Institute of Architects, American Institute of Planners, and several urban development organizations. He serves on the Urban Design Committees of AIP and AIA, and on the AIA Housing Committee. He is a member of the Executive Committee of the Yale Arts Association.

In addition to several articles contributed to professional journals, he is associate author of the book, "Man-Made America: Chaos or Control?", published in 1963, and is Guest Editor of the forthcoming special issue of the Journal of the Franklin Institute, *"New Concepts in Urban Transportation."*

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under which HUD is authorized to assist mortgagors or mortgagees so that the equivalent monthly housing cost paid by the low or moderate income family is not more than 20% of their income. HUD assistance may not be more, than the amount which would be the equivalent of reducing the mortgage interest rate to 1%.

These and other additions, coupled with increased funding and more sensitive direction of older programs, provide an array of Federal assistance efforts to help localities solve their community development and housing problems.

Over the next decade, the housing industry (researchers, designers, developers, builders, financiers, local agencies) will need to consider:

— a new market, whose specific needs and desires are not understood in detail.

— the desirability of low-and moderate-income home ownership.

— the employment of neighborhood residents in the design and construction process.

— the employment of occupants in project management.

The 1968 legislation also contains an important quality component related to design. Congress commended HUD for its recent efforts to improve architectural standards. These include the establishment of the biennial Design Awards program in 1964. The results of the 1968 program, which architectural researcher Carl Koch assisted as a Juror. Also commended was the establishment of an urban design staff in the Office of the Secretary, which I represent, and the appointment by Secretary Robert C. Weaver of Regional Advisory Committees on Design and Planning to advise each of our seven regional offices. Each of these committees consists of a distinguished architect, urban planner, landscape architect and engineer. (As a matter of interest, HUD has about 500 staff members in these professional disciplines.)

The Congress also directed that stronger emphasis be given, consistent with prudent budgeting, to encouraging good design in low-and moderate-income housing in order that the housing can be more attractive as well as better suited to the needs of occupants, and we are moving forward aggressively in following this directive.

This historical development of HUD programs has suggested a clear pattern of increasing national need — now over 30 years old. Is the research response to this current national need for housing quantity and housing quality to be the outmoded and fragmented efforts of the past, or is it to be up-to-date?

What are the ingredients for a quantum jump in housing quantity and quality? They include the following objectives:

— utilize more intensive design and planning efforts to meet user and community needs.

— incorporate advances in building technology.

— increase the potential for nationwide volume production at a more rapid rate.

— lower the initial unit cost and maintenance costs to the developer and occupant.

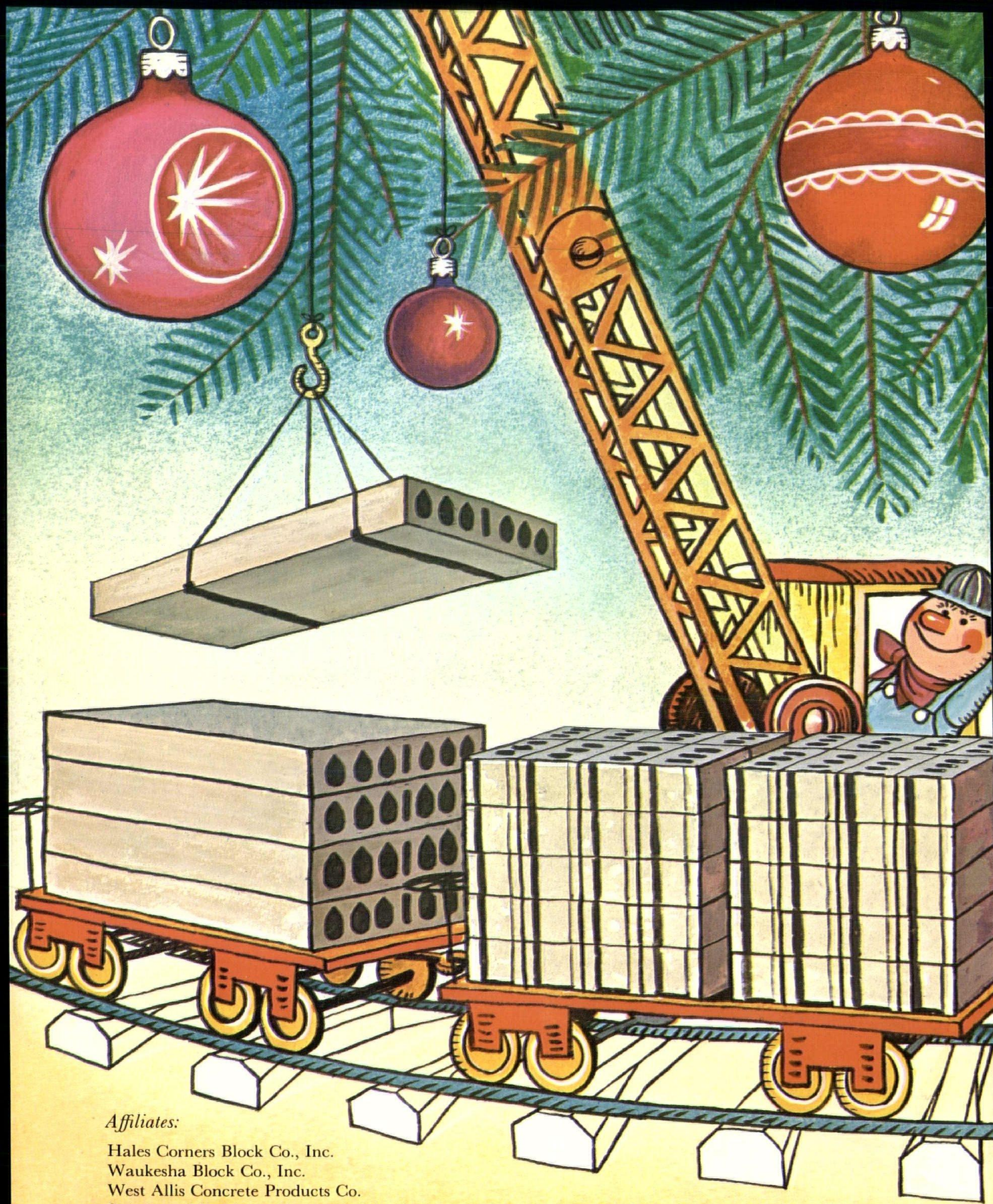
Taking the last item, for example, higher low-and moderate-income housing construction standards have usually been based on the assumption that the units will be subjected to harder use by the disadvantaged families and that the higher initial costs are justified to mitigate increasing costs of operation and maintenance.

Given a fixed top cost limit for such housing, the result is that other aspects of the design will have to be compromised. This can affect both space and equipment.

But space reduction and construction durability are incompatible goals in many ways. There is bound to be more friction between the user and his environment if the environment unduly restrains the freedom of the user.

Of course, the development of a more efficient interaction between space and equipment will help in that, for example, the areas beneath beds and atop closets can be more effectively used. But there certainly is a minimum free space which is required for a family to have the flexibility to respond to the multiple needs of all of its members for an evolving productive life.

In considering form as well as equipment the competing values of production and individuality must be faced. The automobile industry may give us clues regarding these trade-offs. But, how will changes in a family's housing influence their social advancement if



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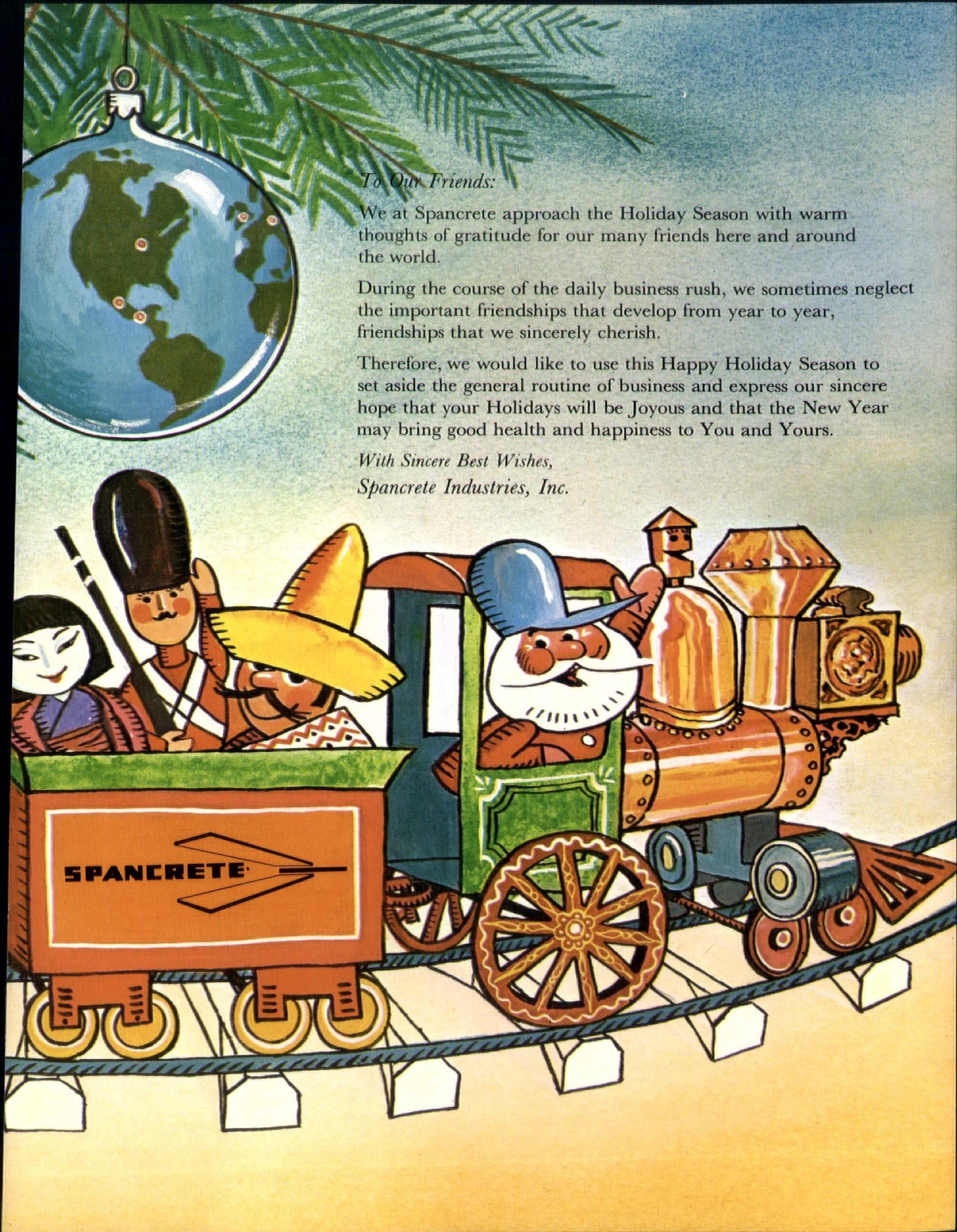


To Our Friends:

We at Spancrete approach the Holiday Season with warm thoughts of gratitude for our many friends here and around the world.

During the course of the daily business rush, we sometimes neglect the important friendships that develop from year to year, friendships that we sincerely cherish.

Therefore, we would like to use this Happy Holiday Season to set aside the general routine of business and express our sincere hope that your Holidays will be Joyous and that the New Year may bring good health and happiness to You and Yours.

With Sincere Best Wishes,
Spancrete Industries, Inc.

both they and their neighbors regard a particular house, or its equipment, such as air conditioning or garbage disposals, as a sign of their social position?

The relative answers to these kinds of questions will importantly affect housing design. We cannot complain that the inhabitants of architectural environments are unsympathetic users, if their needs and values and capacities to absorb new ideas were not well understood at the beginning of the design process.

To gain a better national understanding of these questions and other housing and urban development issues, HUD has been supporting research for some years. These activities have included the subjects of urban transportation, comprehensive planning, urban design, community renewal and housing. Ancillary efforts such as the expanding experimental housing program, which relaxes insurability requirements on forward looking developments, are also important.

In 1967, the HUD Office of Urban Technology and Research was established, which consolidated and intensified our research activities. Then, a twenty-fold funding expansion was achieved — from $500,000 per year to $10,000,000 per year. Last week, the conference committee on our appropriation bill recommended that $11,000,000 be allocated to this function for the current fiscal year. I am told that this 10% gain over last year will, when enacted, make HUD's program the only governmental research effort to increase its annual funding this year!

During the past year, the Office of Urban Technology and Research has undertaken a number of activities to prepare for a long range research and development program. The bulk of attention was given to laying out new programs of analysis, experiment and development to address urban concerns effectively.

But many valuable technological and management innovations now exist in concept or in limited application, and would be in widespread use but for the existence, of a number of constraints. These include zoning ordinances, building codes, craft labor rules, financial policies, city administrative practices, the lack of idea sharing mechanisms, etc.

To determine their character and magnitude, the Department conceived and launched an "In-Cities" experimental housing program. Under this project, a research contractor is developing an integrated nationwide experiment to measure objectively the factors which affect the rapid introduction of innovative low-cost housing in our urban areas.

This research contractor will select a number of promising housing innovations and some 10 to 20 cities which offer useful opportunities for investigating the problems of introducing these innovations. He will then negotiate with non-profit sponsors, architects, building contractors, government agencies and others, for the conduct of the housing sub-experiments in the chosen cities. He will collect the cost, time, sociological and other data with which to measure both the effectiveness of the innovations and the impact of various constraints upon their introduction. Methods for minimizing various constraints will be sought and, when they cannot be avoided, their effect on cost, time and other important factors will be measured.

This information will be made generally available for planning further and more widespread use of innovative approaches to supply housing throughout the Nation. Throughout the program, emphasis will be placed on satisfying the true needs and desires of lower-income families. We expect to commit over $5 million of our R & D funds to this project in addition to some $10 millions worth of related mortgage and construction funds to provide thousands of living units.

To seek out the best ideas, approaches, and management competencies for this project HUD deliberately chose to use a competitive procurement method open to bidders of any organizational type and background. This is an R & D procurement procedure that is well known and one which we can expect to use with increasing frequency within HUD. Nineteen separate organizations, many including architects and identifying subcontractor groups, submitted proposals to become prime contractors. The size of the response, and the quality of many of the proposals, was most gratifying. Three potential contracting groups, composed of a very broad, sizeable and experienced professional staff each demonstrated an impressive understanding of the experimental design problems to be studied and advanced substantially different experimental approaches. Therefore the Department decided to extend the competitive process through a first, contract-definition Phase.

The letter of award for the second Phase was given three months ago to Kaiser Engineers of Oakland, Calif., in association with Building Systems Development, Inc., the General Research Corporation, the Organization for Social and Technological Innovation (O.S.T.I.), the Real Estate Research Corp., the Turner Construction Company and the Battelle Memorial Institute.

As the composition of this group indicates, urban research is largely a multi-disciplined affair for those experienced in urban development. The insights of any one discipline seem not to be infinitely transferable. This indicates the probability that the generation gap between ideas and their effective application to urban situations can be bridged when procedures are developed to structure the appropriate junctions of all the disciplines involved.

We need to consider systems of systems. I am parenthetically reminded of an unfortunate proposal by a major company that should have known better. They set up a project under a well qualified head, and had branches in various specialties reporting to him. One of the specialties was the systems analyst, a man untrained and unskilled in urban concerns. Yet, under the work descriptions, it was he and not the project leader who was to put the effort together! — and he was not capable of dealing with the objective values necessary for that task.

Values as well as cooperation are needed if design is to positively affect our total urban environment. This is a challenge to you and to me; to all of us.

Many disciplines working together can produce a good car, sometimes a good building. Your help, your increasing commitment, is needed if we are to correctly make the jumps in scale and produce a good city.

Decision Making in a Complex Planning Project

(The Baltimore Urban Design Concept Team)
Presented at the Architect Researchers Conference
Norman M. Klein, AIA, Director of Design
Baltimore Concept Team

A proposed 24-mile freeway through the heart of a major city, when viewed as a design and decision process is in many ways similar to simpler design problems. Indeed there is a generic process, which we can identify abstractly, to which all design problems conform. What I shall attempt in this analysis is to first identify the general pattern of design and decision process, then to identify some of the major characteristics of the Baltimore project and to compare them to both the simplistic pattern and to what might be suggested as an optimal urban development process.

As we make this excursion into design methodology we can anticipate certain primary points. First, that process, of itself, is meaningless. It is essential as half of the design unity, as a container for fluid, the other half being the people: the designers, the deciders and the users. Process gives order, people give life. Second, that the gap between optimal design system conditions and today's U.S.A. urban reality is so immense, it is a wonder indeed that anything decent gets done, yet we must continually seek the cutting edge and move forward.

Generic Process

The process consists of four phases:

1. Initiation
2. Design Process
3. Evaluation
4. Realization

Whether the object be a single house or an urban movement system, certain different types of decisions are made in each of these four phases. In simple terms they are the following:

In the initiation phase there is a decision to employ a designer in response to certain felt or assumed needs. What scope will he have?

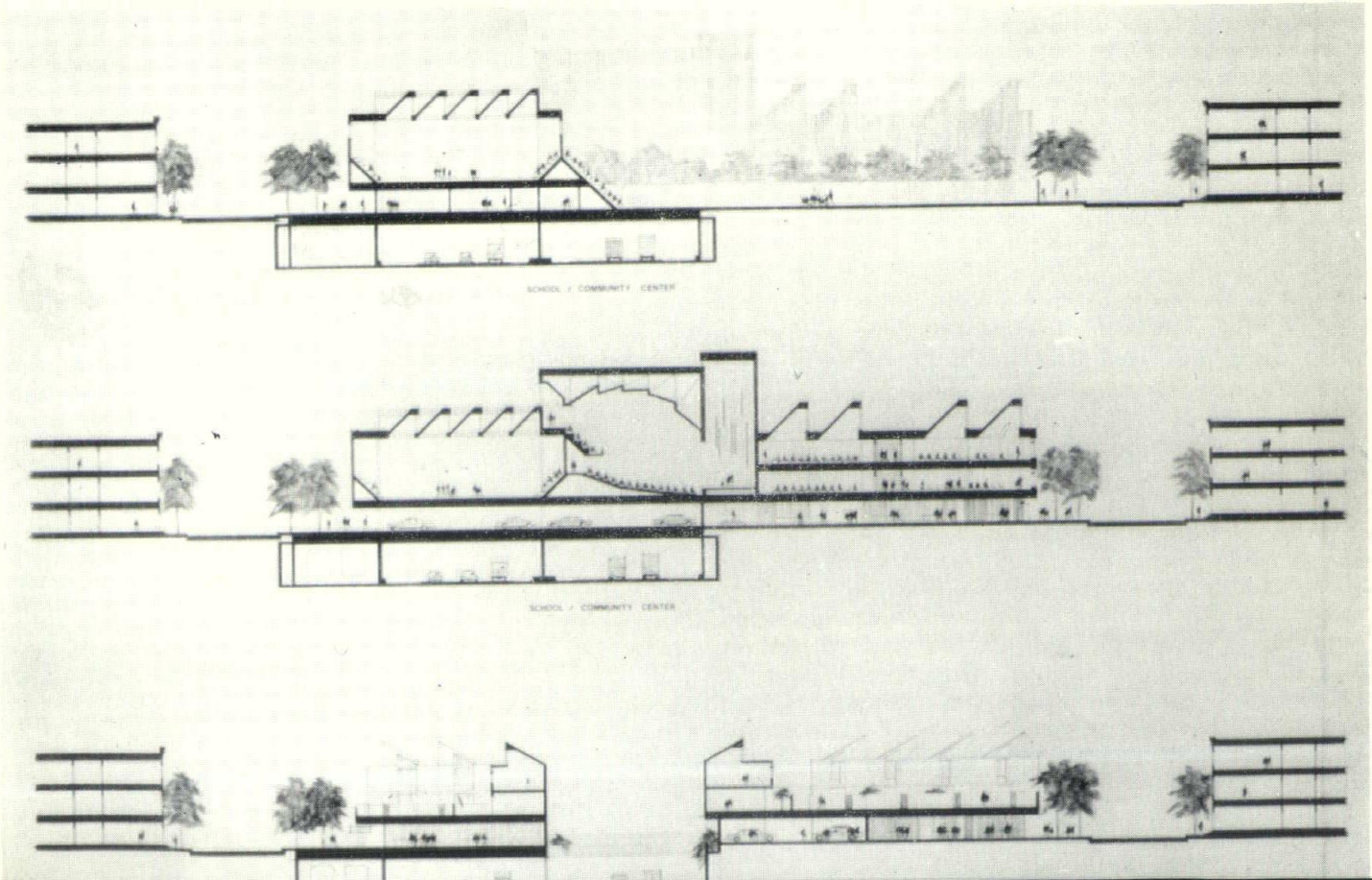
The design process phase is complete when there is a proposal to evaluate. The key decision here is a design decision: which alternative to propose.

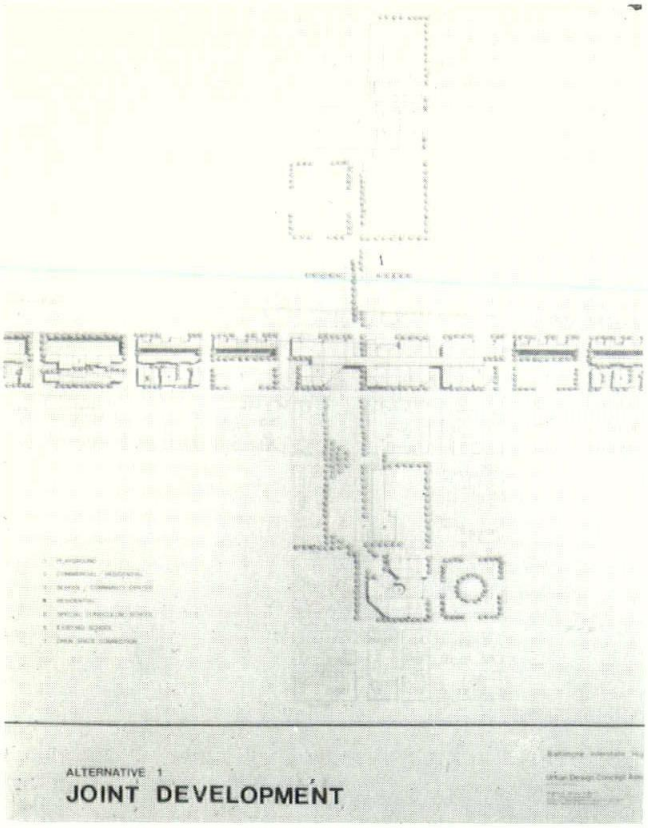
The decision in the evaluation phase is whether to commit resources and proceed with construction and operation of the facility.

Decisions in the realization phase are mostly concerned with questions of how to achieve or modify the plan.

So ends the simplistic phase of this outline.

By reducing the number of highway lanes and by using retaining walls instead of side slopes, land can now be built on for housing, schools and other needed community facilities.





Instead of using the 370' condemned land for highway alone, this joint development proposal would place school, community multi-service center, housing, shops and park in the same already demolished corridor in Baltimore ghetto area.

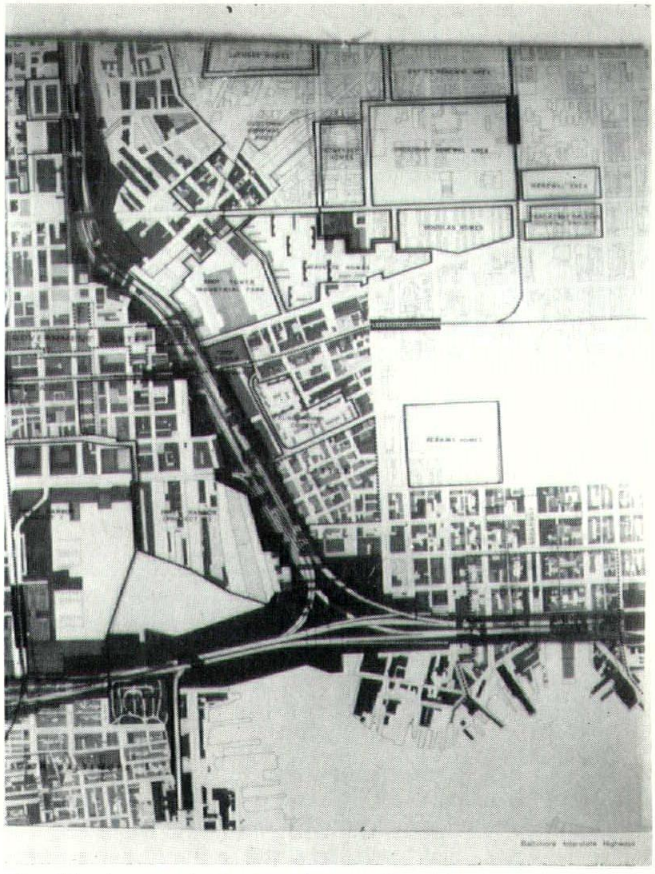
Baltimore — Initiation Phase

It was from a variety of different sources that forces in Baltimore converged into a decision by the State Roads Commission to retain the first major interdisciplinary team to tackle an urban freeway program. This was a significant departure from the usual practice of highway engineers doing the urban freeway job alone. This combination of forces included, first of all, a mobility need for the city; secondly the highway trust fund has a free-flowing source of funds for urban mobility, impeded only by the difficulty of finding the place to put this facility. The third ingredient was that, as in San Francisco, controversy stopped the highway. The fourth ingredient is the fact that the profession of urban design is coming of age.

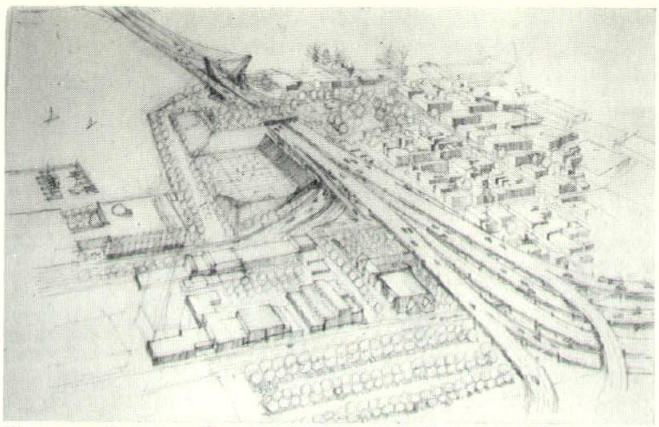
It took approximately one year between the time that Archibald Rogers of the local American Institute of Architects Urban Design Committee identified for the State Roads Commission the process which would organize the Urban Design Team to fit the city and the highway together, and the time that a contract with the Urban Design Team was actually initiated. During this year the City Council of Baltimore was the primary arena in which the play of divergent forces was acted out. There were those who saw no need whatsoever for any expressway. There were those who felt that the anticipated highway must go through come hell or high water, and that anyone who stopped or delayed it was an obstructionist. When finally the Concept Team was formed and started to work on October 3, 1967, it was launched in a context of mixed emotions and was destined to continue its existence under an intense crossfire, which continues today. Before the Concept Team was put to work, the Baltimore City Council passed 24 miles of City Ordinances, through parks, ghetto, waterfront, historical areas, industrial areas and the downtown. The decision to retain the Concept Team to, as the contract says, "be sure that the Interstate System for Baltimore City will be an efficient transportation facility as well as meet the social, economic and aesthetic needs of the neighborhoods," was coupled with the passage of the Condemnation Ordinance. Freedom and constraint in one package.

Design Process

The major objective of the Urban Design Process is to generate that variety of options which can give the community a significant choice over the kind of future environment it will live in. In the context of the highway project there are three components of this environment: the road itself in relation to the total transportation system; joint development facilities, that is facilities such as schools, housing, shopping, recreation and other elements of urban structure, which would either be deleted and might be viewed as compensatory facilities or new opportunities for growth and development stimulated by the presence of the new accessibility. In some locations this means building in the air rights of the highway itself. In others, it involves the air rights and contiguous areas. It also includes buildings far away that result from the presence of the highway for such things as housing or new industrial sites.



The black zone indicates the swath of land condemned before the Concept Team was retained for Baltimore.



The pre-Concept Team plan for the Federal Hill — South Baltimore area.

The third component of the design product, we call environmental programs. These include the things one doesn't see that affect people such as relocation compensation payments to owners and tenants. It involves educational planning. When a highway demolishes a 300-400 strip through a city, it demolishes schools along with other elements of the urban fabric. Environmental programs occasionally lead to physical joint development projects. In the Franklin-Mulberry corridor in Baltimore, the Concept Team together with the School Board and the City Planning Agency, the City and State Governments have proposed to the Federal Bureau of Roads the building of a new educational park and community facility to be connected to adjacent facilities in the neighborhood. Coordination of *all* related government agencies is the need here.

It is clear that among the key decisions is the decision about what kind of process should be used as well as what kind of team it should be. Another key set of decisions is who shall be on the team.

The capability to perform useful service to the community in the face of a corridor that passes through every segment of life in the city cannot be met by any one field of expertise. Rather a combination of the technical, the economic, the urban form, the social, the political and the managerial fields must be focused together.

In Baltimore the team is comprised of a joint venture with primary responsibility and a set of consultants who have advisory roles. The Joint Venture is composed of Skidmore, Owings and Merrill, Mr. Nathaniel Owings as chairman; Parsons, Brinckerhoff, Quade and Douglas; Wilbur Smith and Associates, traffic consultants and the J. E. Greiner Company, Baltimore engineers.

Participating as consultant to the Joint Venture has been Charles Abrams, former head of the School of Architecture and Planning at Columbia University. His primary work has been an analysis of the housing problem in Baltimore and the relocation problem due to the expressway in the context of the overall Baltimore housing condition over the next ten years. Lloyd Rodwin of MIT and Anthony Downs of Real Estate Research Corporation are consultants in economics. George Greir of the Washington Center for Metropolitan Studies is the sociologist. Kevin Lynch and Donald Appleyard have been occasionally consulting on our environmental design process, as well as Horst Rittel of the University of California in Berkeley, who helped with the development of the initial planning process. We have recently been aided by the services of Howard Moskof, the Executive Director of the President's Commission of Urban Affairs. His work, which is strengthened from his experience under Mayor Lee and Ed Logue in New Haven, has been to identify federal, state, and city programs and funds for the *implementation* of joint development projects.

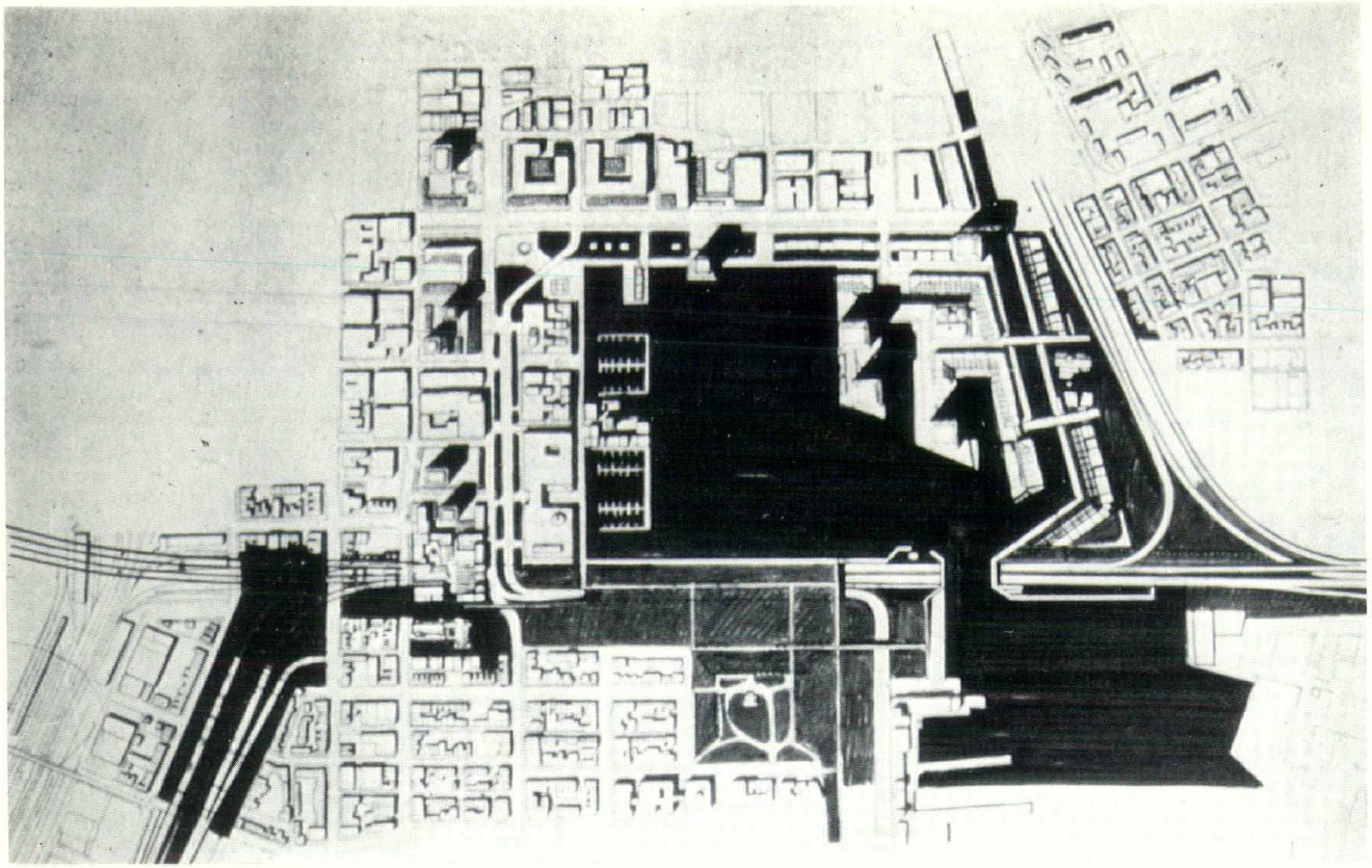
A set of decisions, which has worked out very well, was made at the start of the project. This was to set up different design teams for different sections of the city in such a way that individuals could identify with and understand not only the lay of the land, but the needs and attitudes of the people on a block-by-block basis throughout the stretch of this corridor. These four teams are coordinated by a city-wide team, which relates to the City Planning and the Regional Planning Agencies.

A major issue, involving a key decision, is the extent of community involvement in the design process. This is one of the leading subject candidates for an argument and one in which the Concept Team finds itself under the most crossfire. What we have actually done, is to establish recently a field office in the ghetto area. Prior to that, we have met with neighborhood as well as city-wide organizations concerned with various aspects of the highway. We have attended more than 50 formal meetings and an untold number of informal meetings to gain an understanding of needs of people in the corridors and in the city as a whole. The controversial aspect is from extreme viewpoints. On the neighborhood level, spokesmen from a local group request veto power over a route. On the other side, from the highway interest level, there is pressure to ignore or spoon-feed community groups *after* the decisions are made.

After a year on the job, a group called Movement Against Destruction (MAD for short) has been formed. It represents a wide spectrum coalition of city groups, from Black Power to the archdiocese, and includes the League of Women Voters and members of professional societies as well as representatives from City Council.

As the teams of nearly 70 people move through the successive design phases of the project, that is, first the research and urban design framework phase; and second, the urban design schematic and feasibility phase, a wide variety of conceptual options is generated. Also a wide-ranging display of problems is generated.

Among the most significant design options that have evolved are: the combination school-multi-service facilities in the heart of the ghetto area, known as the Franklin-Mulberry corridor; a proposal to shift the route out of the Rosemont area, a middle-class Negro area in West Baltimore; and a major change in the given route system, perhaps the most important design option recommended. This would, in effect, run a bypass route, which would remove and diminish the impact in the central areas of the city; cause less displacement; result in improved preservation of architectural, historic and neighborhood assets, as well as free up the traffic carrying capability of the freeway



Boat Bridge Plan

system and the central business district streets. The project was one year old on October 3 — and it is a two-year project. The hard decisions remain to be made.

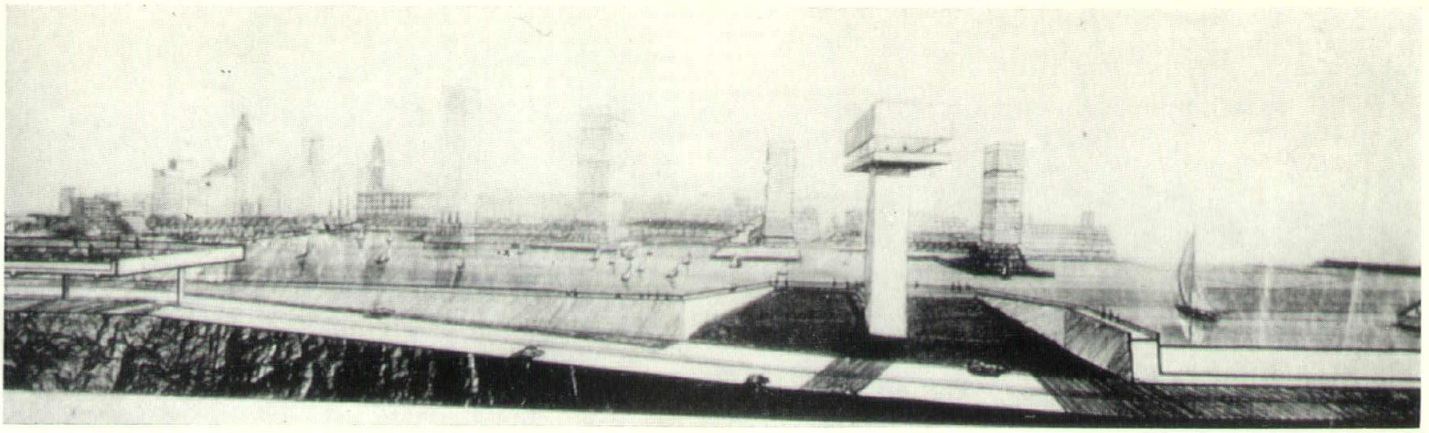
Evaluation Phase

The evaluation process in a complex project such as this differs so much in character from that of a house that urban design becomes a totally different species from architecture on this level. Multiple clients, instead of the single client; bureaucracy, instead of simple efficiency, are the order of the day.

Who is the client in this case? Ideally, at the policy level, there would be a combination of all those with a responsibility for expenditure of funds or policies. This would mean a combination of federal agencies, such as the Departments of Transportation; Housing and Urban Development; Labor; Health, Education and Welfare; etc.; the Federal Bureau of Roads. At the City, Regional and State level there are the State Roads Commission, the Mayor, the various city agencies of Planning; Traffic and Transit; Public Works, etc. At the private sector level, there are representatives of commerce: business, banks, insurance, etc.; representatives of industry, cultural, university and community interests. As it is in Baltimore, there is a Policy Advisory Board, chaired by the State Roads Commissioner and consisting of the Mayor of the City of Baltimore; the head of the City Department of Traffic and Transit; the Attorney General for the State Roads Commission; and two other State Roads representatives. The Urban Design Team relates on a technical, coordinating level to a committee designated by the Mayor and chaired by his development coordinator of the heads of all city departments. The Design Team meets weekly in Baltimore with this group. At the same time, the Urban Design Team staff members have informal liaison with staff level of all the City, Regional and Federal agencies. There is also, naturally, informal liaison with the private community.

The sequence of design decisions on the Baltimore project is as follows: design reviews take place internally with Skidmore, Owings and Merrill staff and the Urban Design Director and subsequently with the partners-in-charge. There is then review by the Joint Venture principals. This is frequently preceded by staff level Joint Venture review. Proposals are then evaluated by the direct client, the Chief of the Interstate Division for Baltimore City. This agency is a combined City-State agency with one chief. The proposal then goes through the Coordinating Committee, the Policy Advisory Board, the Bureau of Public Roads and ultimately the Department of Transportation.

Now that a year has passed, the proposals for joint development have taken on a seriousness that could not have developed until the economics and social and urban design consultants, together with the team members and the community, have completed their analysis and made their determinations. A new client is being contemplated. This will enter significantly into the decision making process. What is being considered now is an urban development corporation. Its task, together with the Concept Team and the City agencies, will be to develop planning and implementation to the point



Boat Bridge Section

where funding from the public and private sector can be secured to achieve proper corridor joint development. The formation of this new entity is under intensive discussion at this time. Some 16 clusters of development, ranging from housing to industrial, to waterfront development, to schools, community centers, commercial facilities, have now been identified along the 24 miles of the highway.

Realization Phase

Perhaps the one thing which makes this project so critical, so pertinent and so exciting is that it will culminate in a real, built, physical product — not in a paper plan; although one might wishfully think that it would be better that the city were a blank piece of paper with time to consider everything, before beginning any work. The fact of life is that the highway is being built as we sit here today on the outer extremities of the city. The major remaining decision to be made by the Policy Advisory Board, and now that the community is attuned to its options, by the community through its City Council as well, will significantly alter the face of Baltimore in the years to come. The most critical decision is undoubtedly one of the route itself. This is expected within the next month.

Next in importance will be the future development of the Franklin-Mulberry corridor, an area which has been prematurely demolished already, even before the road schedule for that area had been set before the Urban Design Concept Team arrived in Baltimore, as 1975. Here the concentration of work of the Team is to develop options that can be started immediately: options of urban development for schools, housing, recreation and community facilities in concert with transportation.

Another key decision is in the field of housing and relocation. Surveys by our consultants reveal that in the next ten years Baltimore will need some 25-30,000 dwelling units. This is far in excess of what has habitually been built. Ninety percent of those to be displaced by public and private projects are non-white. Baltimore neighborhoods have not been, in the past, open neighborhoods. How to meet this reality without driving out faster the white population is an issue that will have to be faced soon in connection with the highway and other public programs.

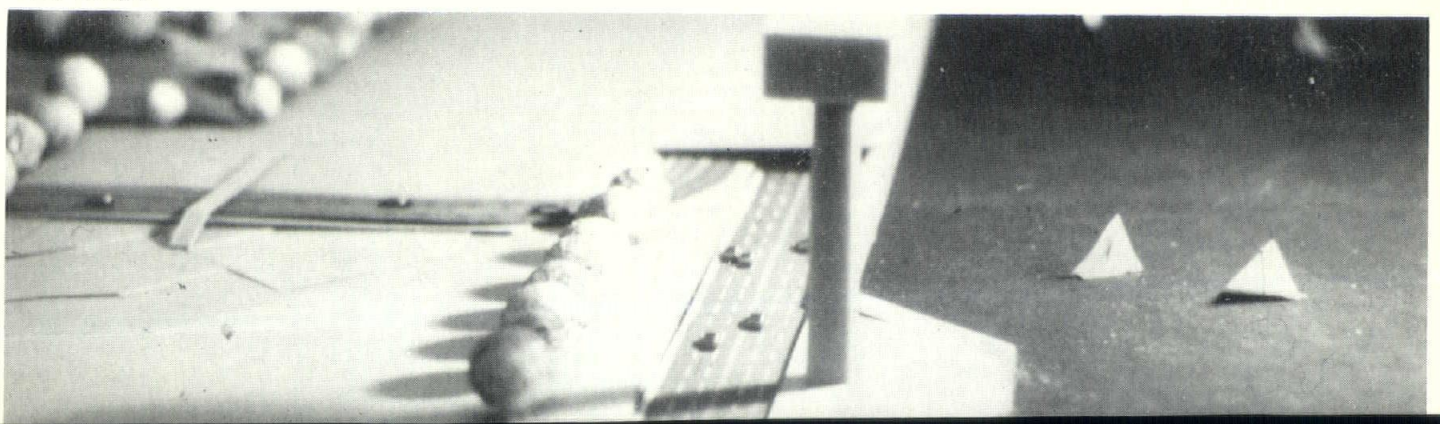
Another key aspect in the realization or implementation phase will be the hopeful resolution of the difficult problem of coordination at the Federal level of the Departments of Housing and Urban Development and Transportation into efficient machines for properly guiding the insertion of transportation facilities into existing cities with skill and humanity.

Conclusion

Mr. Owings spoke recently to the Baltimore Citizens Planning and Housing Association. The talk was called "Planning in the Fifth Dimension." By this phrase he meant decisions by the people, properly informed. As at the Czech movie at Expo the audience was asked to participate in the decision as to which ending — happy or tragic.

The urban design process has this capability, to display options so that democracy can be more truly approached. Instead of silent decisions by vested interests, the people through their elected representatives can make the key decisions.

An exploratory concept to shift the route away from the houses on Montgomery Street and put the road underneath a "boat bridge."



waf Wisconsin Architects Foundation Report

by Dorothy Schweitzer, Executive Secretary

1968 Student Forum

In joint sponsorship by The American Institute of Architects and the Association of Student Chapters, AIA, the University of Michigan at Ann Arbor hosted the 1968 Student Forum, November 23-27. Heretofore the annual Student Forum has been held in Washington, D. C., and beginning with the 1968 event at Ann Arbor, future Forums will take place on the campus of other Schools of Architecture in various parts of the country. The University of Michigan was the first school to be selected for this decentralized program.

The theme of the 1968 Student Forum was "Turmoil/Educational Evolution," with the hoped for stimulation of student opinion to help those who will have to deliberate and decide on future needs.

The keynote speaker was George McCue, H.AIA, *St. Louis Post-Dispatch*, and other prominent participants in the program included Dean Bruno Leon, AIA, School of Architecture, University of Detroit; Robert C. Metcalf, AIA, Chairman, Department of Architecture, University of Michigan; Professor Walter B. Sanders, FAIA (U. of M.), Past President of the Associated Collegiate Schools of Architecture; Dr. Earl W. Pellerin, FAIA, Director, School of Architecture, Lawrence Institute of Technology; S. Glen Paulsen, AIA, President, Cranbrook School of Art, and others.

Field trips included Cranbrook School of Art, Metropolitan Detroit, General Motors Technical Center, and Ford River Rouge.

It was natural that the new School of Architecture at UWM would want representation at the 1968 Student Forum. It was fortunate in the early formation of the School that a qualified Student Chapter, AIA, could be formed according to AIA regulations (those of minimum sophomore status) and therefore was eligible to send a delegation. Four of these students were selected to attend the Forum. Their observations, to be reported back to their constituents and the School, should prove profitable as the result of this interesting exposure.

The Directors of Wisconsin Architects Foundation, on the recommendation of President Wenzler, agreed to finance in part the expenses of the four students for the four-day Student Forum at Ann Arbor, Michigan.

It should be noted, as having been reported before, that the Foundation contributes annually to the AIA-ACSA Seminar for Teachers of Architecture. In 1969 the Foundation will want the new School of Architecture faculty represented. As for the Student Forum, future consideration will be given also.

Year End Contributions

To the Foundation's thoughtful friends and the new friends hopefully counted on, the Foundation offers seasonal felicitations.

The month of December is the time when Wisconsin Architects Foundation receives the most substantial contributions of the year. A growing number of these, on an annual basis, come from organizations associated with the profession of Architecture, and the Foundation is most grateful for this continued consideration.

It is sincerely hoped now that the new School of Architecture has been established, contributions will greatly increase.

Perhaps it is time to remind some Chapter members, those who shied away from contributing in the past for the reason that the Foundation's student aid went out-of-state, they have plenty of opportunity now to show their enthusiasm for the new School through contributions to the Foundation.

Contributions, through thoughtful memorials so appropriate by an architect in promoting aid to architectural education, are emphasized time and again. The formal cards of acknowledgment have been reproduced on this page. The neglect by many of this meaningful gesture is regrettable.

All gifts to the Foundation are tax deductible, State and Federal.

IN MEMORIAM

Wisconsin Architects Foundation offers sincere condolence to Mr. and Mrs. Lawrence Bray in the loss of their son, Gregory.

Christmas

is the light in

a child's eyes

Christmas is the joy of giving. It's the early-morning shouts and wonder-filled eyes of children . . . the beauty of a brightly-lighted tree casting reflections on tinsel, ribbons and shiny presents.

And Christmas is a bell that rings from the tall steeple of a country church, slowly echoing across the sleeping fields. It's the crunch of new snow beneath wheels . . . the warm handshakes of many friends and neighbors . . . cheerful greetings that rise on the crisp winter air.

We at J. W. Peters & Sons wish to add our most heartfelt greetings to you and your family in this most wonderful of all Holiday Seasons. We appreciate your friendship and the opportunity to serve you and thus have a part in the outstanding contribution that you are making to the welfare of this nation.

May this Christmas be the most joyous ever . . . and your New Year be blessed with great happiness and prosperity!

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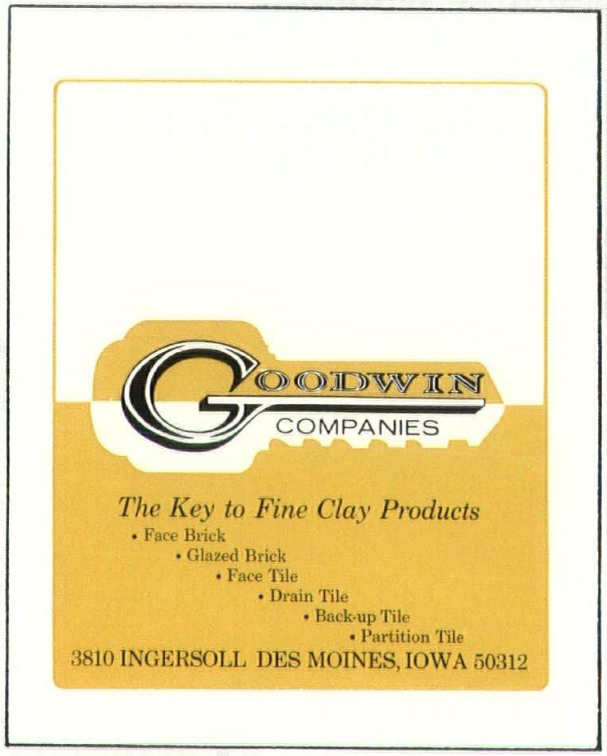

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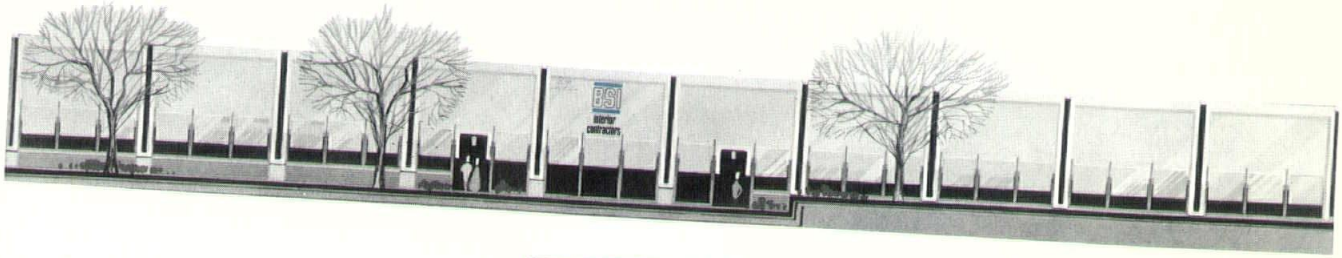

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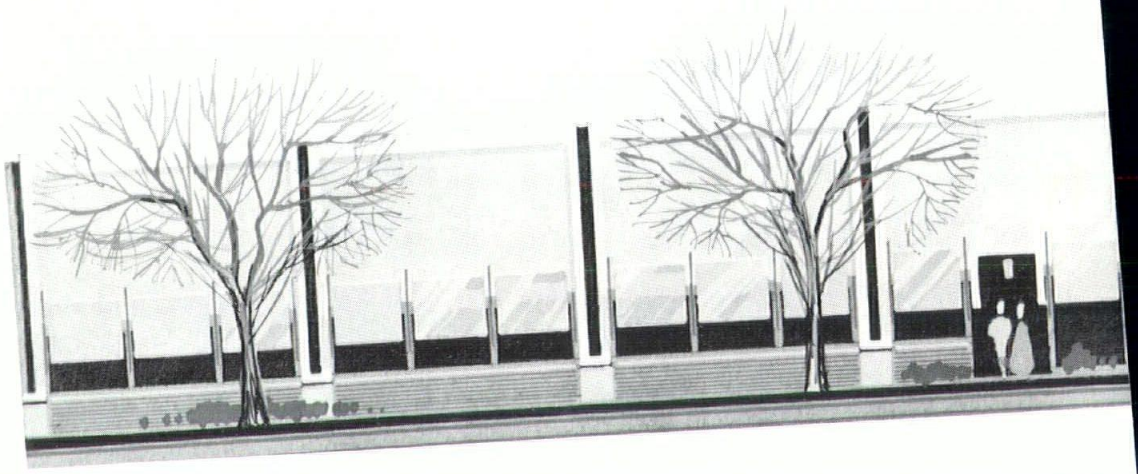

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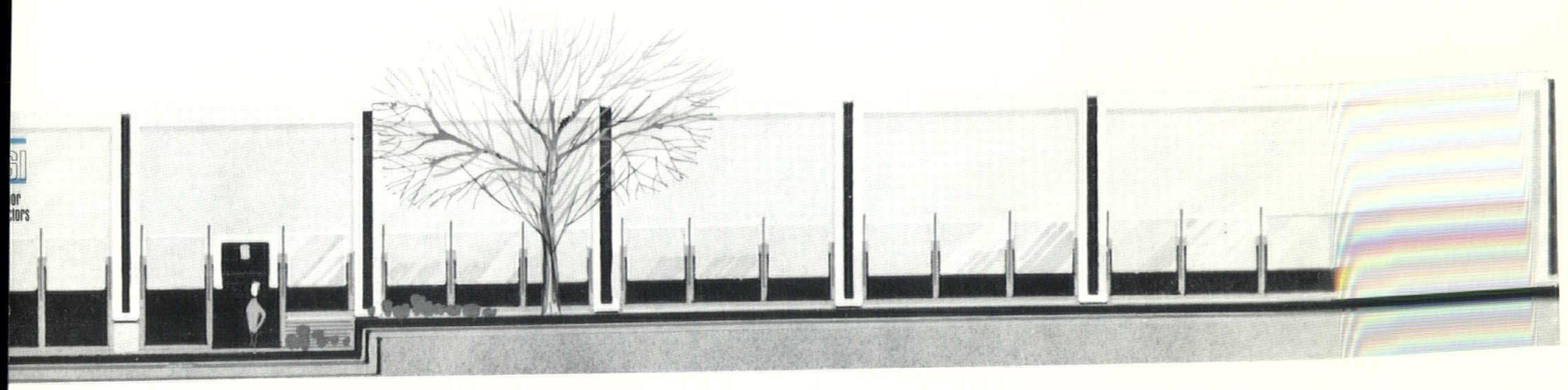

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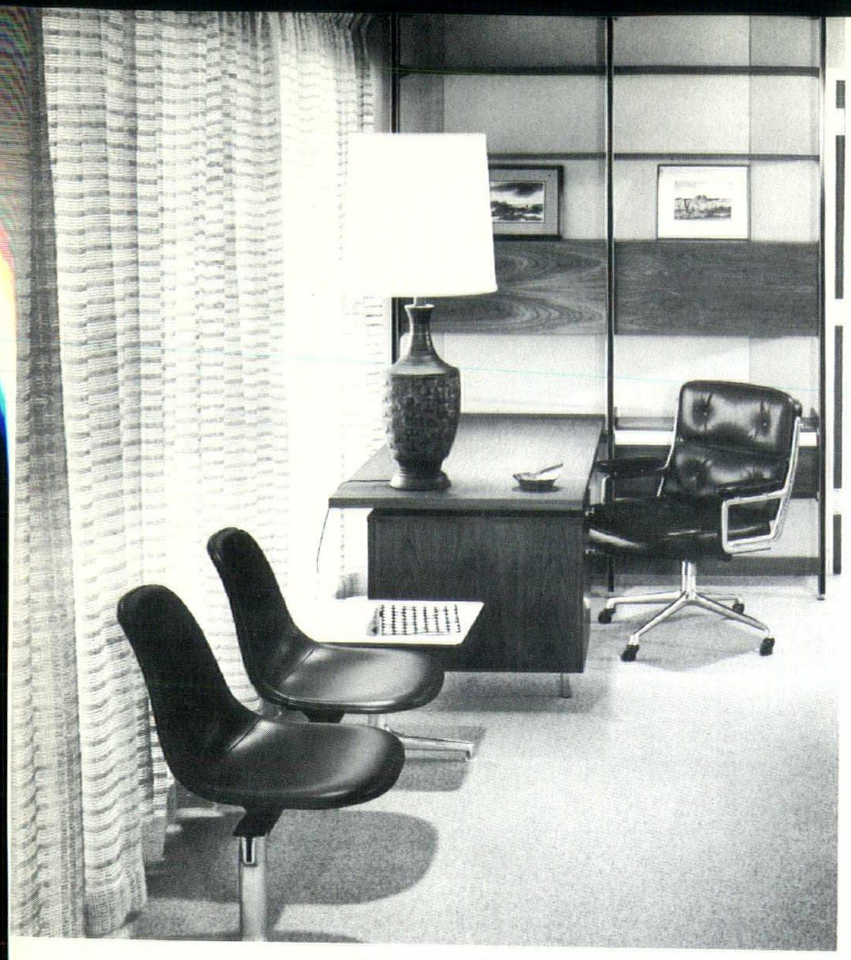

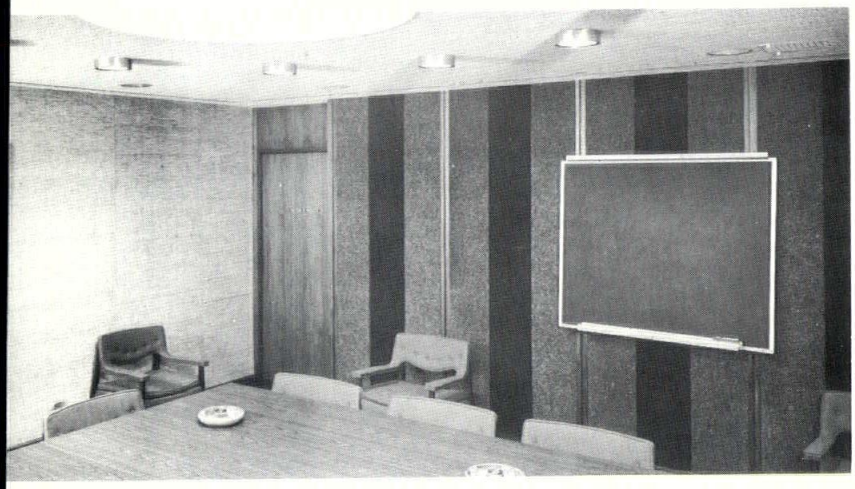

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On these and the next two pages are a variety of interiors constructed by Building Service Inc.

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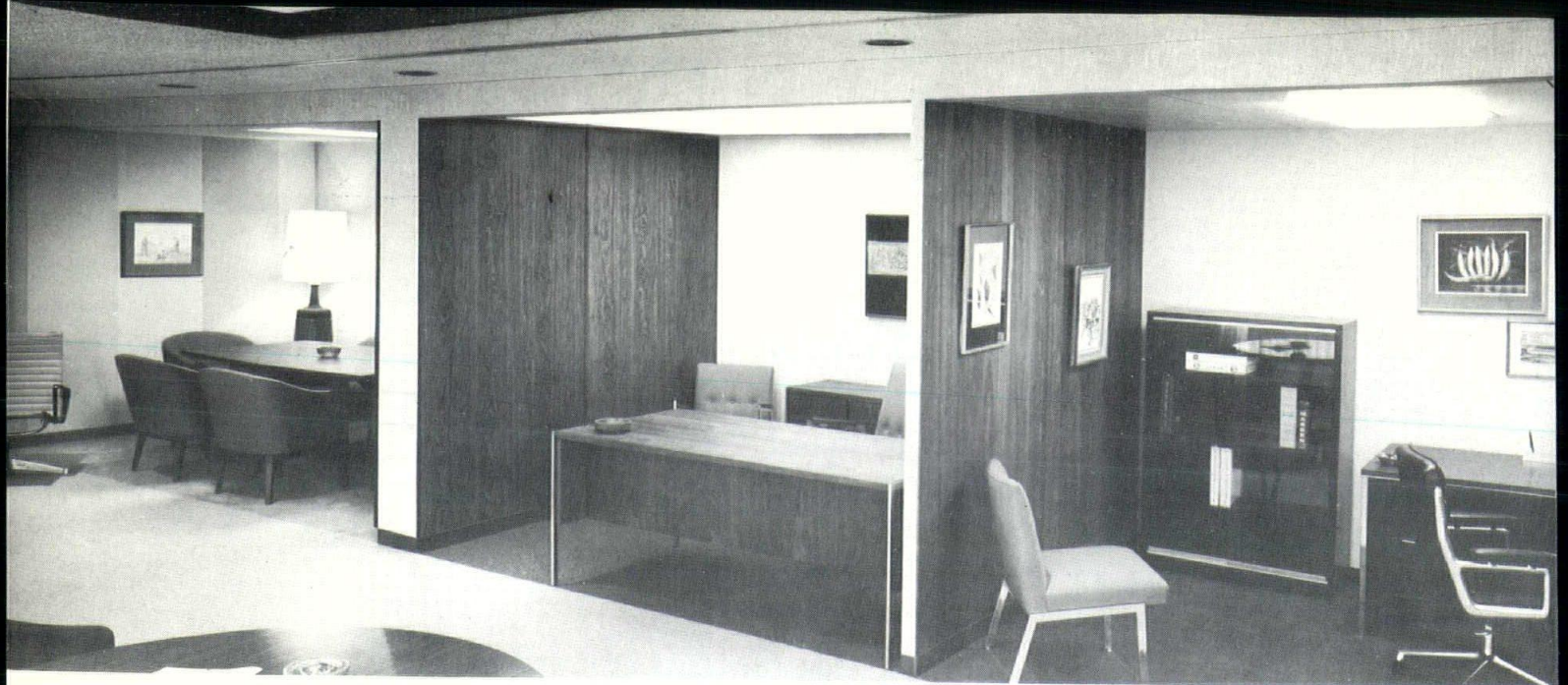

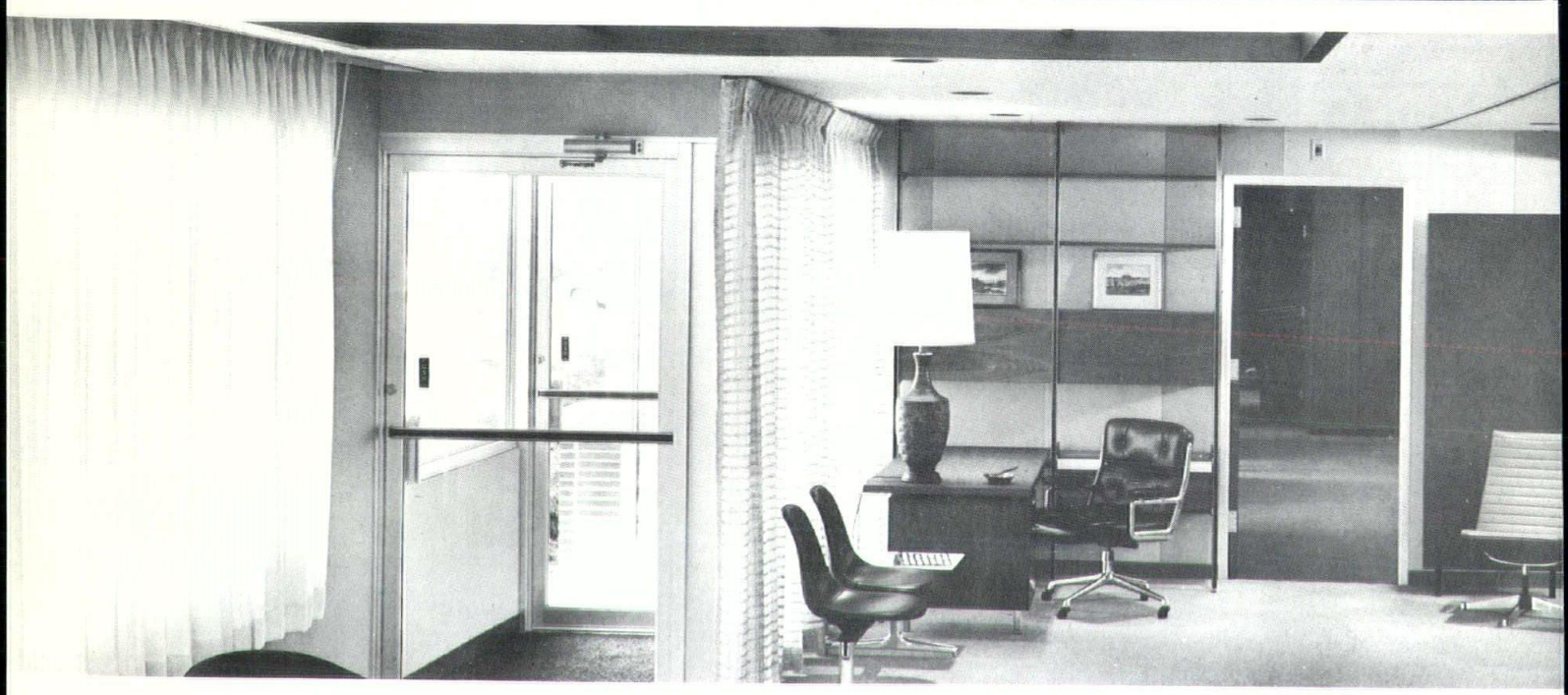

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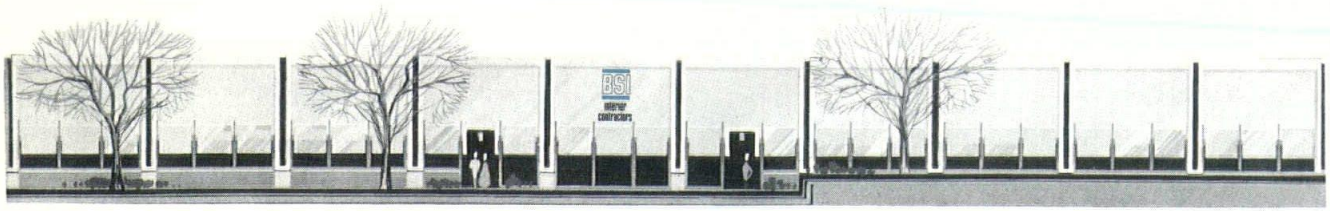

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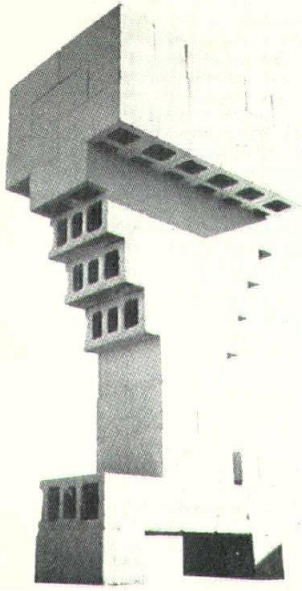

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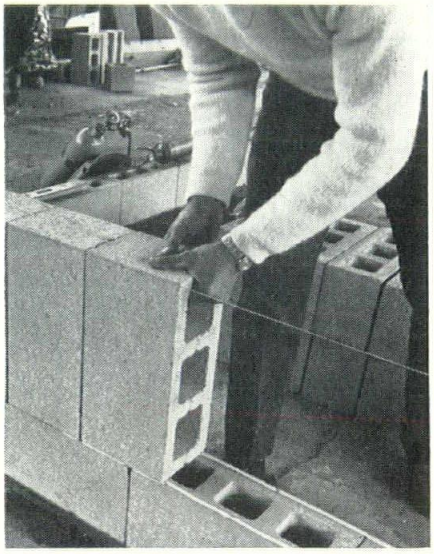

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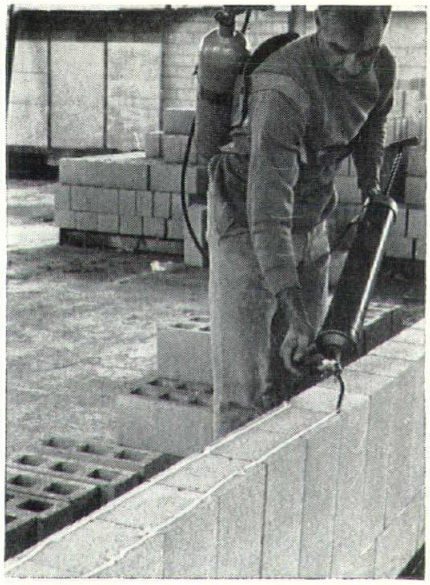

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