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Builder: Crow, Pope & Carter
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BUILDING TYPES STUDY: SCHOOLS

Seven well planned, well designed and soundly constructed schools will be featured in November as solid evidence that these qualities can be achieved in a building type that seldom has big budgets. The examples cover a broad range of typical program requirements: countryside and big city locations, grade levels from K-2 to senior high, and plans to accommodate standard curriculums and the newer teaching techniques.
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3. Precooler assembly.
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This research center's roof is "painting" itself


This research center in Seattle stands in the center of a residential community, and is designed to be compatible with the surrounding area. Its outstanding feature is the roof which is made entirely of bare USS Cor-Ten High-Strength Low-Alloy Steel. As Cor-Ten Steel weathers, it "paints" itself with an attractive, dense, tight oxide coating that retards further atmospheric corrosion. If it is scratched, it heals itself, and the longer it weathers, the better it looks.

The architects, Naramore, Bain, Brady & Johanson, selected bare Cor-Ten Steel for its rustic beauty. It should never need paint, and its economical good looks will last the life of the building.

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Cor-Ten Steel is available in a full range of structural shapes, plates, bars, and sheets. For full details on its use in architecture, contact a USS Construction Marketing Representative through our nearest sales office, or write for our booklet. U.S. Steel, P.O. Box 86 (USS 5476), Pittsburgh, Pa. 15230.

USS and Cor-Ten are registered trademarks.
The Housing Act: We know what it says, but what does it mean?

I'm not sure anyone, including HUD, the Congress, and the President, understands all the details and the implications of the new 300-page Housing and Urban Development Act of 1968. Its main provisions were summarized on page 81 of last month's RECORD, but the big question remains: What will be the impact—on quality of environment and on architects—of this $5.3-billion package?

It seems to me that what could happen (and what architects ought to be ready for if it happens) is a boom in housing with the same kind of impact on urban places as the post-World War II boom had on the suburbs.

The government mechanisms that fed that boom were the National Housing Act of 1934 (which was set up to move capital during the Depression, but didn't work until after the war) and the Servicemen's Readjustment Act of 1944 (the VA) which introduced the idea of no down-payments and 20-year mortgages. Bill Levitt was the first entrepreneur smart enough to figure out how to make those two bills work, and he showed the way to others who in a few years created an industry which built a ring of houses around every major city in the country.

Has the same kind of boom—this time inside the cities—been triggered by the new Act?

The President's goal under the new program is no less than the construction of 26.2-million new housing units in the next 10 years, which is almost double the number of units built in the past 10.

Says HUD Secretary Weaver, in what seems an understatement: "This is a very large commitment by the nation to the people of America's urban places, and it is particularly designed to help those Americans who most need help."

The main emphasis is, of course, on volume—and volume fast.

The act provides very easy terms for buying and renting for families with very low incomes, it makes a number of long-stalled FHA programs workable by upping their unrealistic mortgage limits, it gives a real boost to new investment by big corporations in new cities and urban spaces alike, and—by spinning off Fannie Mae towards private ownership and permitting it to sell mortgage-backed securities—could attract massive amounts of money into the mortgage market.

At any rate, it does look as if a number of fuses have been set that could generate the kind of building volume that Weaver sums up as "no less than the building and rebuilding in the next 10 years of enough good, decent housing to replace substantially all of the standard housing in America."

All of this is, of course, just a goal— and an election-year goal at that. How much of this giant program gets funded and implemented depends very much on a lot of things—who is elected President (and who he appoints as HUD secretary); the mood of the Congress after election; whether the electorate acts towards increasing black militancy in the cities with increasing fear, increasing sympathy, or increasing distaste; and of course on the state of the world's cold, cool, warm and hot wars.

But let's assume the program is well funded and gets underway on anything like the projected scale. What is the hope for an emphasis on quality, for more involvement of architects, for the kind of environment that everyone would like to live in and with?

There are some good signs: The new Act, as has been pointed out, specifically permits some clients (notably nonprofit organizations) to obtain direct loans for up to 80 per cent of specified "necessary expenses prior to construction"—specifically including site engineering and planning and architectural fees.

Further, because of the higher-density and greater complexity of the new housing—as compared with the suburban housing of the last big boom—more architect involvement is assured than in an earlier day when any builder figured he could save money by "designing" his own houses.

Finally, we enter this boom (if boom it is to be) with the architectural profession in a much stronger, much more involved, much more organized, and much more experienced position than it was when the suburban boom began. Most Federal and city government officials now clearly understand the role of the architect within programs they sponsor; and most architects now understand that they must—if they are to be effective and create the kind of urban housing that is so desperately needed—involve themselves in the frustrating and time-consuming political and social processes involved.

There are some bad signs too: HUD persists in pinning what seems like too much hope on "new and advanced technologies," on Turnkey, and on new kinds of "national housing partnerships."

So what the architectural profession needs to do now is to be very watchful. The last time Federal legislation built a housing boom, the design professions muffed their opportunity. Nobody is going to make the same mistakes in the late 1960s as were made in the late 1940s. But the profession must not make any new mistakes—it must watch for (indeed, fight for) a chance this time to make the maximum contribution to the environment. The quality of living for 26.2 (give or take a few) million families is at stake.

—Walter F. Wagner, Jr.
"... take care not to exaggerate the potential contribution..."

The Ford Foundation, whose efforts I almost always admire greatly, has just added to my feeling of admiration by publishing a little pamphlet entitled "Technology and Cities—A Foundation Viewpoint," written by William C. Pendleton, who is a program director in the Foundation's National Affairs Division. He begins by pointing out that 'The Ford Foundation for several years has had something called 'urban technology' on its agenda, but has made only a handful of grants to promote it. This inaction reflects," Mr. Pendleton confesses, "more than anything else some bafflement about what 'urban technology' actually is, and a consequent uncertainty about what a foundation might do about it."

I hope it is not unfair and out of context to skip to page 10 of Mr. Pendleton's analysis and quote several ideas which he suggests are presented "more as hypotheses than as conclusions—ones to which the reactions and comments of others are solicited."

His first hypothesis: "... we must take care not to exaggerate the potential contribution of technology to solving the problems of the cities. The really critical and immediately pressing problems—poverty, unemployment, crime, bad housing, poor health, and inadequate education—will persist until the nation finds the will to provide very basic economic, social, and political solutions."

His second hypothesis: "... is that the potential role of the systems approach to urban problems, at least as the approach has developed in the aerospace industry, is currently being over-sold to a rather substantial degree." And he quotes Joseph Engel, new president of the Operations Research Society of America, as saying that: "As we move closer and closer to human beings, human life, and to its goals, we find that we are dealing progressively with more and more difficult problems. ... We're very good at hardware and tactical problems and starting well-defined research and development programs. We're lousy at strategic and philosophical problems."

Further, Mr. Pendleton argues in his booklet: "It is not at all obvious that the heritage of Department of Defense and National Aeronautics and Space Administration contracts prepares the aerospace companies to operate in the context of municipal problems."

Mr. Pendleton, if you are interested in my reaction and comments to your hypotheses, I'm with you. Might I also make so bold as to suggest (not so much to you as to some HUD officials) there's a large band of informed and involved people who are pretty good at solving strategic and philosophical problems related to the cities. What they are is architects.

**Riot area insurance: sure-thing department**

It's surely a good thing for the more-troubled of our city neighborhoods, but I feel no big urge to jump up and down and heap praise on the insurance industry for its latest "contribution." It turns out, according to a recent rather breathless HUD release, that "insurance companies representing an estimated 80 per cent of total property coverage in the nation are 'eager and willing' to participate in the riot loss reinsurance coverage authorized in the Housing and Urban Development Act of 1968," and that "this means that insurance protection will become more available to homeowners and businessmen who were formerly denied coverage because they were located in areas exposed to riots or civil disorder."

Under the Act, HUD reinsurance is effective for most of an insurance company's losses. The formula is all pretty complicated, but it seems as though the insurance companies are now enabled to pass along a pretty fancy part of their risk to HUD and thus, as usual, the taxpayers.

Such a provision is clearly desirable to enable investors and homeowners in troubled areas to operate without fear of being wiped out financially as well as physically; but let's give credit for the risk-taking to the right parties.

**Horizontal elevators: reducing the interface problem**

As a commuter to New York City faced twice a day with a variety of "transportation interfaces," I keep being intrigued by the idea of horizontal elevators. The term is creeping into conversation more and more, and the latest discussion comes in a release from George W. Jernstedt of Westinghouse. He argues that "We have done a fine job of packaging vertical elevators and applying them in our buildings; but once we hit the ground we run into all kinds of interface problems." He argues that a horizontal system with the same advantages as elevators is the missing link in public transportation. "Horizontal elevators would provide transportation for people wanting to go as far as four miles or as little as 400 feet. They would be faster than walking and their cost could be absorbed in the buildings they connect..." It would take some planning, but it has some real appeals. It's not that I mind so much paying 20 cents to ride the bus. What I mind is apologizing for not having the exact change and still getting snarled at.

—W.W.
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ABOVE:
Urethane mix is injected through spaced access holes in the finished cinder block wall. Pressure of expanding foam forces it into every chink to form seamless thermal barrier. Exudate signifies filled cavity.

LEFT:
Poured between pre-built cavity walls, rigid urethane foam means ease of installation after masonry work is done plus long-term cost-saving benefits that can be measured in low rental and heating bills.

**New material know-how and sharp pencil give high-rise builder new lows in rental costs**

Two 13-story apartment buildings, now rising from the rubble in the Springfield, Mass., urban renewal program, will provide roomy, modern living quarters for elderly families at monthly rentals of $43 to $60. Design and materials specs for the government-supported project, approved by HUD, emphasized functional efficiency and long-term maintenance economy.

“A critical factor in meeting the stringent budgetary specifications is an electric heating system made economically feasible through use of a seamless core of urethane foam insulation in the cavity walls,” says Vito Caolo, project architect. “Without rigid urethane foam, we could not have utilized all-electric heating as we could not have met the strict structural and operational requirements in any other way,” Mr. Caolo said.

The electric heat/urethane foam combination was selected because it offered lowest initial cost of installation, plus the prospect of lowest operating costs when compared to three other fuel combinations (involving oil, gas and electricity) included in the study by consulting engineers, Greenleaf Associates, of Cambridge, Mass.

Total construction costs ran to $15,750/sq ft, considered quite reasonable for a reinforced concrete structure with a number of special design features to accommodate elderly occupants.

The urethane insulation is being installed by A. Belanger & Sons, Cambridge, Mass. It is poured in liquid form into the 2½-inch cavity between 4-inch brick and cinder block walls. Access spaces were left at 4-ft intervals for injecting the urethane mix. The foam expands immediately into a hardening cellular mass that fills every nook and crevice to form a seamless, air-tight, total thermal and moisture barrier. The foam has a k factor of 0.12 (ASTM C-177-63) and a nominal density of 2 pcf, equal to 3-4 inches of fiber glass.

The Twin Towers project is being built by Perini Corp., Framingham, Mass. The foam system and technical service are provided by the Resinous Products Div., Diamond-Shamrock Chemical Co., N. Arlington, N. J.

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For details, see Sweet’s—or write Lennox Industries Inc., 333 S. 12th Avenue, Marshalltown, Iowa 50158.

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Lennox systems’ flexibility combines people comfort, economy & designability.
Spacious, beautiful country club provides members' indoor comfort with "micro-climates" from concealed rooftop installations of Lennox unitary central systems. Four individually-controlled comfort zones come from one DMS1 unit of 22 tons cooling capacity and 500,000 Btuh gas heating. A Lennox GCS3 furnishes heating, cooling and ventilating for the large single-zone area (capacity: 8 tons cooling, 250,000 Btuh gas heating). Kitchen and locker rooms are heated and ventilated by another unitary system.

Direct Multizone units on roof serve many comfort zones through flexible duct which can be moved as zone boundaries change.

Patrons and employees of the 80 stores and theatre in this colorful, exciting shopping center will find the comfort right! Some 800 tons of cooling will come from a variety of Lennox equipment atop the center's 18-plus acres of buildings. Among the Lennox equipment supplying this large volume are: GCS single-zone combination gas heating/electric cooling units for large, undivided spaces; DMS units for the many individually-controlled comfort zones; condensing units coupled with coil/fan units; and other modular central systems.

Lennox GCS3 all-weather combination gas heating/electric cooling unit serves single-zone areas from rooftop or grade level.

Comfort flexibility keynotes the gas heating/ventilating system of this striking new church building. To supply both upper and lower floors economically and efficiently, two new DMS2 units are installed in the equipment room. One unit serves multiple zones of the lower floor (Sunday School classrooms, etc.), the other serves the upper floor entrance hall, sanctuary and choir room. Provision is made for easy add-on cooling in future.

A new Direct Multizone System now adds flexibility in multiple zone applications for single and multistory buildings.

These new quarters of a leading—and growing—surgical instrument manufacturer have "room-to-grow" air conditioning and heating, in a "room-to-grow" building. Six Lennox DMS units provide the comfort for a 30,000-plus sq. ft. production area divided into six zones. Two other units take care of the 15,000 sq. ft. office area, in 12 separate comfort zones. Rooftop mounting conserves inside space; and, with flexible ducts, helps make possible easy expansion for growth.

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Rough-in through the wall.

The Sarasota tub, formed steel with acid-resisting enamel, features a raised outlet that permits waste line to be installed through the wall.

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General Contractor: Magazine Brothers Construction Corp.
Sheeting Subcontractor: Washington Plyrite Company
Sheeting Fabricator: Goodyear Tire and Rubber Co.,
New Bedford, Mass.
Flexible, non-hardening Butyl tape makes an effective seal against the extremes of weather on these tall dual-pane windows of the Northwestern National Life Insurance Building in Minneapolis.

The preformed tape of Enjay Butyl and polyiso-butylen has 100% non-oxidizing solids... provides a strong bond between glass and external stop... gives practically permanent sealing. And it resists shrinking, hardening, cracking and ultraviolet rays.

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General Contractor: George Fuller, Chicago, Illinois.
Tape Manufacturer: Tremco Manufacturing Company, Cleveland, Ohio.

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Unusual window design uses Butyl rubber caulk for sealing.

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The modern business environment thrives on quiet, sound-absorbing floor covering. This is the Collins & Aikman carpet developed of Zefkrome acrylic to provide a think-ful quiet where people work better and feel better in surroundings that mute the noise of modern office machinery. Not only can’t you hear a pin drop. The Collins & Aikman carpet is so durable, you can’t tell how much traffic has passed over it from one day to the next. And because Zefkrome is a round, cross-section acrylic that resists soil-entrapment, maintenance problems can be brushed off in one clean sweep.

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Colombian new town avoids "so-called modern architecture"

The new town of Guatavita, Colombia, which opened late last year, provides facilities for a population of 1200 people on a 53-acre site. The architects and planners for the project, the firm of Llorente & Ponce de Leon, came up with three unsuccessful plans, before, says Ponce de Leon, "we decided the only course was to sit down with the 140 families who had decided to move to the new town, and work out individual plans for each of them, and then to develop an over-all design for the town that would encompass their individual plans." A total of 28 basic house plans was developed, providing from one- to six-bedroom facilities.

The new town was necessitated when the old town of Guatavita was flooded to form a new artificial lake behind the Sesquile Dam on the Tomine River. After construction began on the dam to produce cheap hydroelectric power and to solve flooding problems in the Bogota River Valley, the Bogota Power Company retained the architects and planners to plan the new town with the residents.

First planning on the new town, located on a bluff above the old town, began in 1963. The principal design objectives, said architect Ponce de Leon, were to give the town a harmony and unity and to avoid "so-called modern architecture. Many of the residents had seen the modern buildings of Bogota, with their glass and steel and brick, and told us that this was exactly what they didn't want. They liked their old architecture, with its thick walls and tile roofs and extensive use of wood, and this is the material we used to build Guatavita. We developed a plan for the town using the same construction systems and building materials, but adding modern lines to their use."

The plan of Guatavita separates vehicular from pedestrian circulation. The town has more than 160 buildings, with 129,000 square feet under roof, and cost approximately $1.7 million. New public facilities include a municipal hall, church and rectory, open and covered public markets, bull ring and cattle yards, three schools, hospital, outdoor theater, slaughterhouse and cemetery.

As Ponce de Leon was working on the project, he was elected to Guatavita's County Council, where he is now serving his second term as president. The Council has taken steps to maintain the design harmony of the town, having enacted regulations forbidding the use of roofing materials other than tile and controlling the colors that houses may be painted.

The new town was financed by the Bogota Power Company with the assistance of the World Bank and the Inter-American Development Bank. An exhibition of photographs, models and charts of Guatavita opened August 21 and will continue through mid-October at the Colombian Center of the Republic of Colombia in New York City.

Mitchell/Giurgola resign from A.I.A. headquarters job

Four years after winning the national competition for design of a new headquarters for the American Institute of Architects in Washington, D.C., the firm of Mitchell/Giurgola Associates of Philadelphia has resigned from the job. The resignation was announced on September 23 at a meeting of the national Board of Directors of the A.I.A. in San Antonio. In accepting the resignation "regretfully", the Board commended the architects for designing a building "to the satisfaction of their client, the A.I.A."

Commenting on the announcement, A.I.A. President George E. Kassabaum stated: "The architects feel that resignation is the only course open to them in view of the impasse that has developed in obtaining approval of the Fine Arts Commission. We understand this feeling about making further compromises. However, we feel that the principle of design review boards is the best known means in maintaining order in the face of all the pressures leading to chaos. . . ."

Gruen Foundation formed to aid "human environment"

A new foundation has been formed by Victor Gruen, architect and urban planner, to support research and other efforts aimed at improving the human environment. In announcing the formation of the Victor Gruen Foundation for Environmental Planning, Mr. Gruen said "The task of shaping our environment is not the concern of one specific profession but of architects, planners, engineers, scientists, sociologists, economists, educators, psychologists, jurists and public administrators. It has been recognized that in our age of specialization, the danger of diminishing communication among various disciplines exists. The resultant lack of understanding among 'specialists' threatens to block efforts to improve the environment. One of our major purposes is to encourage young men and women to become 'generalists' trained to think and act in the interest of general overriding goals and aspirations."

The Gruen Foundation will organize and collect research materials into a library for use by scholars and students; sponsor and arrange conferences and seminars of multi-disciplined scholars; sponsor specific research projects; and publish and disseminate research, studies and reports done by or under the aegis of the foundation.

continued on page 46
The new Imperial Hotel in Tokyo with its 1,000 guest rooms, added to the 600 in the existing east building, will be the largest hotel facility in the Orient. It is this hotel that replaces the Frank Lloyd Wright landmark, described in Louis H. Sullivan's article in ARCHITECTURAL RECORD (February, 1924) as the "most significant architectural monument that the world can show."

Shown here is the Pergola of the old Imperial, a reminder of the hotel that in 1923 withstood, better than any other building its size, perhaps the most severe earthquake ever recorded. It is a reminder, too, of the external richness of a "hotel complete in all details for the comfort and entertainment of the traveling public, or residents... a clearing-house not only for the social obligations incurred by Japanese official life in its contacts with representatives of other lands, but also for the great social functions now inevitable in the high life of the Capital" (Sullivan, RECORD, April, 1923).

The new $55-million Imperial has been designed by Teitaro Takahashi with an additional public in mind—the growing Tokyo conventions. The hall will have interpreter booths, TV facilities and a hydraulic stage.

The Blue Cross and Blue Shield Building, Chattanooga, Tennessee, will have a sky-lighted center court through which four glass-enclosed elevators will rise to cross bridge lobbies on each of the office floors. The 10-story bronze-tinted glass office building, designed by Edwards & Portman, will be supported on a colonnade of concrete cylindrical forms above a landscaped plaza. Four major cylindrical forms at intersecting corners will contain the air distribution system.

An addition to the Regency Hyatt House in Atlanta (July, 1967, page 42), also designed by Edwards & Portman, will be a circular bronze glass tower, which is cantilevered from a central elevator core above the existing ballroom. The new 25-story tower will be 30 feet from the present structure to protect the views of each structure, and will contain 200 rooms and a two-story restaurant.
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Strong pattern scaled for the size and impact of a building is easily achieved with the massive "Monumental" style Borden Decor Panel.

A custom designed aluminum facade of Monumental is a major element in the remodeling of the Lansing Community College building shown above. Originally built in 1875, the structure is now updated with stone, new first floor brick and windows, new entrances, and the Decor Panel screen which contains 48 fire doors concealed and blended into its pattern. Cantilevered off the wall 2' 6", the Monumental screen uses "T" bars for greater spans and greater strength. This individual pattern uses structural tees on alternate centers of 16" and 8", with reversing slant tabs at 8" o.c. and tilted 26°.

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The Lutheran Church of the Good Shepherd, Moorhead, Minnesota. Architect: Sovik, Mathre and Madson; general contractor: John T. Jones Construction Company.

"The building has much of the visual quality of high Romanesque. It is very good spatially. Fine interior space, sensitively used materials. Skillful detailing and use of materials really outstanding."


"This building employs subtle variations of form and plan which are well-controlled and give an appropriate interest to both exterior elevation and interior space. Good handling of materials, restrained and sensitive details."


"Human scale, warm and serene quality. Obviously pleasant place to be. Design really reflects mission of project."

A.I.S.C. awards program

A steel bridge studio at San Luis Obispo, California, designed by Thomas Palmer and Larry Stricker, students at California State Polytechnic College with architect Paul Neel, adviser, is one of 15 winners in the ninth annual competition for steel framed buildings sponsored by the American Institute of Steel Construction. The awards jury praised the project for its "effective use of a difficult site," and the solution as being "imaginatively simple."

The Los Angeles Federal Savings and Loan, Los Angeles, designed by architects Honnold and Rex with Greve and O'Rourke, structural engineers, and Kemp Brothers, general contractor, was praised by the A.I.S.C. jury for its "attractive and skillful use of exposed structural steel framing." The jury consisted of architects Sam T. Hurst, H. Samuel Kruse and Wayne R. Winsor; engineer Fred N. Severud; and urban planner Harry C. Adley.
Medical Sciences Unit I, University of California, Irvine, which will house the College of Medicine presently located in Los Angeles, will form the nucleus of a 150-acre health sciences complex. The seven-story building, with five stories above ground, has been designed by E. Todd Wheeler and The Perkins & Will Partnership. The exterior of the $14-million structure will be exposed concrete with tinted glass.

Beach Channel High School, New York City, will be more than three city blocks long and will include an outdoor amphitheater, an oceanography department with a marine display area, and docking facilities for excursion boats. The school, which is to overlook Jamaica Bay and will require some 2.5 million cubic yards of land fill, will consist of an irregular cluster of buildings surrounding three courtyards. A 1000-foot by 500-foot athletic field will have facilities for seven sports. Handren, Sharp and Associates are the architects. Completion is expected by 1971 at a cost of about $18 million.

Central Islip Rehabilitation Center, Long Island, New York, has as its focal point a broad open stairway to the upper level that will encourage patients to meet informally. Armand Bartos and Associates designed the building with an exterior of scored concrete block. Interior courts provide natural light and landscaping. Cost: $2.4 million.

The Fifth District Volunteer Fire Department Firehouse, Columbia, Maryland, will have a trapezoid-shaped roof covered with asphalt shingle and supported by wood trusses. Architects Gehry, Walsh & O’Malley have designed the firehouse so that room for additional fire equipment as well as living quarters for a full-time fire company can be added to the basic design. The building, constructed of concrete masonry units, will have two equipment bays with doors at both sides, a central control office, a lounge for meetings and social functions and a 45-foot hose-drying tower.

An engineering and administration building in Burbank, California is sheathed in a skin of bright aluminum with strip windows of reflective glass. Architects are Daniel, Mann, Johnson, & Mendenhall—Cesar Pelli, designer. The Lockheed-California Company building will ultimately house 1800 employees, at part of a $60-million expansion program.
Below-stage view shows part of the lifting equipment designed and built by Dover for the Jesse H. Jones Hall for the Performing Arts, Houston, Texas.

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- University of California, Los Angeles, Calif.
- Atlantic City Convention Hall, Atlantic City, N.J.
- Jesse H. Jones Hall for the Performing Arts, Houston, Texas
- Brigham Young University, Provo, Utah
- Americana Hotel, New York City
- Clowes Memorial Hall, Indianapolis, Ind.

- West Senior High School, Aurora, Ill.
- Grady Gammage Memorial Auditorium, Tempe, Ariz.
- Xavier University, Cincinnati, Ohio
- East-West Center, Honolulu, Hawaii
- University of New Mexico, Albuquerque, N.M.

For more data, circle 27 on inquiry card

Dover Corporation / Elevator Division
Your editorial comments about the Grand Central project seem so much more relevant to the realities of the architectural process than the caterwauling about aesthetics from everyone else. Of course the growth of New York is not a matter of visual beauty alone, even though the Planning Commission itself often seems to wish it were so. And even if it were, I applaud your recognition that buildings are not seen in the city as free-standing towers. It makes little difference whether the Pan Am building is on top of or behind Grand Central—it looks the same. And perhaps the latest model Breuer will be an improvement over the earlier great wall.

As a matter of record, it's not true that the Concourse will be unaffected if its five south bays are filled. Although the loss of the original skylights in these areas and the once-possible view through two walls of glass to 42nd Street has greatly altered the original design, I doubt that a solid wall can be claimed as an equal replacement for a sun-filled room. (But this is all aesthetics, too, and the most essential fact about the Concourse is that it will continue to serve, however maimed, as a great mixing chamber for the city.)

I delight in your assertion that criticism of the new building is silly if we all accept the system which produces it. But who will change the rules if all that architects discuss is beauty?

Hugh Hardy
Hardy Holzman Pfeiffer Associates
New York City

I read, with great interest and regret, your editorial regarding the foreseen 175 Park Avenue Building which may rise over the roof of the unfortunate Grand Central Station. I believe it unfair to accuse the present City Planning Commission of trying to do belatedly what former City Planning Commissions were urged, in vain, to do. In 1955 The Herald Tribune published a statement of mine in which I asked the City then to take some steps in the direction they are trying to take now. Perhaps the profession is not to be blamed for past delays but rather it has finally found in the present City Planning Commission some response to its past prompting.

I do not believe that a serious analysis would find a particular advantage to a railway station that handles 40,000 people per hour in an additional taxi-feeding line on 42nd Street capable of taking in four taxicabs bumper to bumper against the curb.

Several times I read your apt remarks in the August RECORD regarding criticism of the Grand Central project wondering why I could not agree. Certainly the logic of your analysis is clear and irrefutable. The circumstances enmeshing economy with time and place propel a juggernaut of expedient practicality, and he who says nay to shrewd and legal development is crushed. There is no disputing the corollary that pressures of the time demand a keep-up or drop-out response from the architect. Though to some, there is concern that in keeping up we strain the professional physique. Our architecture (projecture is more descriptive of current vast construction) in rhythm to contemporary tempo seems instant, total and computerized—an extension of mass-cult which thrives only as a mechanized society. The human dimension, even as scale figure, is replaced by the packaged air conditioner.

But, in our free-enterprise, profit-oriented society, Morris Saady cannot be expected to worry about general conditions in the Grand Central area: nor is it good business for Penn Central Railroad to shun $3 million a year for 50 years; and indeed, an architect practices his profession only if he has a client whose interests become his own. Then, who is left to safeguard the general good of people, but people whose best efforts seem but to compound enterprising profiteering—to what end, stifledom? No, the emotion is not surprise but terror!

If there is a message in this jeremiad, it poses a query. Is a viable logic attainable whereby man (as professional critic, architect, planner, landmark preserver, commuter and other folk expert) can find identity in his abode—or pleasure—or perchance, glory?

Human values, tangibly, if tenuously, defined in respected institutional and international bodies, have matured through historical periods of episodic negation, trauma, and perversion. From a Toynbee perspective can be recognized a humanism which developed to challenge the ruthless era of survival by fitness and thus to foster civilization. The French termed this attitude noblesse oblige. Call it, today, the obligation of power.

Is it a Pollyana gesture to seek such response of our movers and shakers, circa 1968? To a concert of Morris Saadys, Penn Central Railroads, architects of integrity like Mr. Breuer, magazines of repute such as ARCHITECTURAL RECORD, people mired in the complexity of this time look for expression. For, as people, we are always with you.

Giorgio Cavaglieri, F.A.I.A.
New York City

A. McVoy McIntyre, A.I.A.
Boston

COLORFUL INFORMATION BOOTH IS CONSTRUCTED OF 20 DOORS

A bright, candy-striped yellow, red and orange information booth for the Department of Parks of New York City was first used last summer at the Fifth Avenue and 60th entrance to Central Park. The booth was designed as a service to the city by architect Myron Goldfinger. The booth is constructed of 20 plywood doors bolted together. The booth is a temporary collapsible structure with assemblage time taking one-half hour. The overall size of the structure is 11 feet by 11 feet by nine feet high, and its storage size is two feet by three by seven feet. A pilot project, the booth may be the forerunner of similar installations in other parks.

CIVIL ENGINEERS CITE SAN MATEO-HAYWARD BRIDGE

The San Mateo-Hayward Bridge, an orthotropic bridge that spans the southern reach of San Francisco Bay (shown above is the high-level portion with the old steel truss lift-span bridge in the foreground) has been cited by the American Society of Civil Engineers as the "Outstanding Civil Engineering Achievement for 1968." The project was selected by a jury of seven technical magazine editors. The bridge was designed and its construction supervised by civil engineers of the Division of Bay Toll Crossings, a unit of California's Department of Public Works. Designed to carry 50,000 vehicles a day, the $70-million bridge is 6.7 miles long and includes a 4.0-mile low-level concrete trestle and 1.8 miles of high-level bridge rising to 135 feet over the channel.
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and fabricator developed components that would fit together on site. Result: one floor of wall system was completed every three days. Proof that Alcoa has the know-how to work with architects and fabricators to make aluminum work for them. (B) Lake Point Tower is a thing of beauty. The aluminum components feature Alcoa's Duranodic* 300 finish in medium bronze tones. And the rich Duranodic color is an integral part of the metal. This means corrosion and abrasion resistance is multiplied. Duranodic needs less maintenance, yet its original color and beauty last and last.

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A Jamison cold storage door gives you the obvious values of the finest materials, excellent construction and proper functional design. It's what you'd expect from the oldest and most experienced maker of cold storage doors.

In addition to these obvious values, Jamison gives you hidden values. Architects find especially valuable the architect data sheets which describe in detail each door that we make. They also give complete specifications which may be used with possibly only slight modifications.

Another value we would like to offer you. Send for a free copy of our book "How to Select and Specify Doors for Cold Storage Warehouses and Food Processing Plants." This in no way obligates you to specify JAMISON. But if you value VALUE, you will.

For complete details write to Jamison Door Company, Hagerstown, Maryland 21740.
A new solution

to solar heat and glare problems

PLEXIGLAS®
SOLAR CONTROL
SERIES
The transparent grey and bronze colors of PLEXIGLAS acrylic sheet shown above have been developed by Rohm and Haas Company to help you control the sun’s heat and glare. Each of the colors in the PLEXIGLAS Solar Control Series is produced in five densities from light to deep, providing a range of solar control values. Solar energy transmittance values range from 20% to 75% and visible light transmittance values from 10 to 76%. Using them for glazing dome enclosures, sun screens and windows, helps you achieve comfortable interior environments readily and economically.

In addition to its high breakage resistance, weatherability and light weight, PLEXIGLAS has three significant advantages for solar control glazing:

1. PLEXIGLAS is not subject to thermal shock—it will not crack when exposed simultaneously to hot sunlight on one portion and shade on another.

2. Solar energy and light transmittance values are approximately constant for all sheet thicknesses in each color density. Sheets of high color density need not be of greater, more costly thickness.

3. PLEXIGLAS is accepted under most building codes as an approved, slow-burning, light transmitting material for use in glazing and domed skylights.

Write for complete information including data on how to calculate solar heat gain for the PLEXIGLAS Solar Control Series. It’s contained in our new 20-page brochure.

Trademark Reg. U.S. Pat. Off., Canada and principal Western Hemisphere countries. Sold as OROGLAS® in other countries.

For more data, circle 37 on inquiry card
In many cases, unnecessary concrete increases the amount of reinforcing steel. And that increases cost.
That's why many architects, engineers and contractors favor voiding the concrete.
Voiding also permits faster installation. Greater areas can be formed and poured at one time because less concrete is required per square foot.

So next time you're working with pre-cast or cast-in-place concrete, plan to void it.
And one of the best ways to do that is to use SONOVOID fibre tubes.
They are lightweight. So they are easy to handle and install. Yet, they are strong enough to meet any job requirement.
SONOVOID tubes are available in a wide variety of sizes for maximum design flexibility. For example, the longer lengths permit longer spans.

For more information on SONOVOID fibre tubes and a copy of our slab design tables, write Sonoco Products Company, Hartsville, South Carolina.
And start getting rid of some dead weight.

SONOCO PRODUCTS COMPANY, HARTSVILLE, S. C. • Akron, Ind. • Atlanta, Ga. • City of Industry, Calif. • Holyoke, Mass. • Hayward, Calif. • Longview, Texas • Louisville, Mo. • Lowell, Mass. • Montclair, N. J. • Munroe Falls, Ohio • Mystic, Conn. • Newport, Tenn. • Richmond, Va. • Tacoma, Wash.
MEXICO: Mexico City • Also in Canada

For more data, circle 38 on inquiry card
Today's ARCHITECTURAL SENTINEL in modern enclosed shopping malls from coast to coast

KINNEAR ROLLING GRILLES

The most modern attractive way to provide the extra security needed today for display windows and store fronts. Regardless of which of the choice of designs selected, Kinnear's standard 9" maximum spacing of vertical links insure a better looking, stronger grille ... and the 1 1/2" maximum bar spacing will repel objects even as small as a golf ball. This construction insures an extra rugged dependable barricade without sacrificing public vision of merchandise displays — or light, or circulation of air.

That's why Kinnear Rolling Grilles are proving so popular with national organizations everywhere. Spring counterbalanced and coiling upward, Kinnear Grilles are easy to open or close and completely out-of-the-way when open. They're built in any size and suited to either electric or manual operation. Another adaptation of time-proven Rolling Doors, pioneered and backed by Kinnear — an international organization recognized over 70 years for leadership and service. Write for catalog.

KINNEAR CORPORATION and Subsidiaries
1880-88 Fields Ave., Columbus, Ohio 43216
Factories:
Columbus, Ohio 43216  • San Francisco, Calif. 94124
Centrailia, Wash. 98531  • Ont., Canada

— for maximum protection for outside display windows specify Kinnear Rolling Doors — the solid steel barricade

Offices & Representatives in All Principal Cities — listed in Yellow Pages under "Doors." Also see Sweet's!
Concrete puts drama into Atlanta's new Robert F. Maddox Hall

The magnificent facade of this 4600-seat theater gives promise of the excitement of the performing arts to be experienced inside. Staggered, irregularly-shaped side and rear walls provide additional architectural interest both within and without. Part of the $9,000,000 Civic Center, this building faces onto an expansive landscaped concrete plaza which it shares with the Exhibition Hall.

The concrete in the entire complex was made with Lehigh Cements. Lehigh Portland Cement Company, Allentown, Pa.

The thin, graceful cast-in-place concrete columns that flare into unusual angular arches on the facade are 56' high. Inside, the seating area is practically surrounded by lobbies and wide corridors with many of them leading to small cantilevered outdoor balconies.

Cast-in-place concrete walls of the structure range as high as 84'. The auditorium stage area is 50' deep and 85' high—large enough for the bulkiest of scenery. 30,000 cu. yd. of concrete were required for The Civic Center which also includes the large Exhibition Hall.
Hemisphere '68 opens its doors. And the new Convention Hall, Theater and Arena do it with Prrrco®—the versatile aluminum doors now offered in complete entrance and framing systems.

Prrrco Doors offer more design freedom. Specify three standard stile widths in a range of standard sizes. Or have them built to your custom specifications. Available in a variety of anodized colors, you can even mix and match two-tone combinations.

Prrrco Doors have slim, elegant lines. All hardware has hidden fastenings. And its tie-rod construction makes the door exceptionally strong.

Here you see custom Prrrco Doors in bronze-colored anodized aluminum, framed with Prrrco's 6550 series flush glaze system. For additional information consult Sweet's Architectural File or Prrrco Architectural Metals, PPG INDUSTRIES, 1500 Murden St., Kokomo, Indiana 46901.
Of the 12 other constant pressure pumping systems, not one has all the advantages of Aurora's Apco-Matic.

Seven don't have Apco-Matic's low initial cost (none costs less) • Eleven don't have Apco-Matic's low installation cost (none costs less) • Eleven don't have Apco-Matic's low operating cost (none costs less) • Five don't have Apco-Matic's instant response to system change • Eight don't have Apco-Matic's low maintenance characteristics • Ten don't have Apco-Matic's SCR control and squirrel-cage AC motors • Twelve don't have Apco-Matic's control bypass for emergency operation • Eight don't have Apco-Matic's compact dimensions (none is smaller) • Twelve don't have Apco-Matic's versatility that provides a built-in automatic standby, yet uses only two pumps! Need we say more?

Aurora Pump, A Unit of General Signal Corporation, Aurora, Illinois 60507

For more data, circle 42 on inquiry card.
Top-jamb mounted closers featuring narrow styling to blend with the slim styling of modern aluminum door frames.

Top-jamb narrow-projection closers with covers in anodized or painted finishes to match hardware or door finish.

SERIES J6120
Top-jamb mounted Unitrol controls. A combined door closer and door holder with shock absorber to protect door, frame, and closer.

Even where heavy traffic indicates the use of a door holder, there's no need to compromise the appearance of your entranceway. The unique Norton® combination of door closer and door holder, the Unitrol® control, provides the answer. All the functions of a closer and a holder in a single styled package. Mounted on the door-jamb to eliminate the cluttered look and improve the door silhouette.

CONTACT YOUR NORTON REPRESENTATIVE FOR COMPLETE DETAILS.
Anacondability pulls the plug on plumbing bottlenecks, saves space, speeds construction on every type of building.

Adds value

to single family dwellings. Copper plumbing in a home says "quality" as no other material does . . . adds significantly to its worth and marketability. And the Anaconda name on the copper tube and pipe enhances the builder's reputation for using only the best. Added advantage: Anaconda provides a broad range of tube and fittings to meet every blueprint requirement.

Coordinates delivery

In housing developments. Anacondability makes planning easier by providing you with one dependable source for all ACR tube, copper water tube, DWV, wrought copper and cast brass fittings, plus low pressure cast brass valves with both solder and threaded joints. It works to coordinate deliveries when you want them, where you want them. Got a tight schedule to meet? Talk it over with your Anaconda representative. You'll find him eager to help.
Saves space

in hotels, hospitals, institutional buildings. Anaconda offers copper runouts that can save space and costs by installing easily in 12-inch chases. This represents a savings of 6-inches in chase width ordinarily required by galvanized pipe and fittings . . .

that's 48 cubic feet in an average size room!

You can credit Anaconda's slim fittings and superior corrosion resistance in copper for making this savings possible as well as practicable.

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Do you specify lighting panels with your eyes closed?

About eight out of ten architects and engineers never specify brand names for plastic lighting panels. As a result, many of their clients wind up with inferior panels which are “slipped in” on a price basis.

If you use general pre-written specs for lighting panels or simply specify by type . . . you lose control of the job.

The only way to make sure you’ll get Specification Quality panels is to write strong specs. Include brand names . . . or spell out photometric standards panels must meet.

Today, there are only two lines of Specification Quality plastic lighting panels. One is K-Lite . . . made by KSH, world’s largest manufacturer of lighting panels.

Check with your fixture manufacturer. You’ll find that K-Lite quality is a bargain.
Bally Walk-Ins help handle the change in American eating habits

More and more affluent society eats away from home. Teenagers have more money to spend. Schools have better and more diverse menus. Industrial cafeterias attract and satisfy more diners. Hospitals, nursing homes and institutions are upgrading their feeding programs.

Inspired operators of mass feeding places everywhere are rising to the challenge of this new American way of life with imaginative profit making ideas and menus. A good example is the wide spread use of foods pre-prepared during low peak hours to make more effective use of kitchen personnel and help offset higher food costs.

The most important advancement within the kitchen is the increased use of refrigeration. Today Walk-In Freezers are a must . . . and along with companion Walk-In Coolers provide high "profit-earning" space for perishable food storage. Bally prefab design permits assembly of Walk-Ins in any size and shape to fit existing space and traffic patterns . . . with walk-in doors and glass service doors located where they improve workability.

Patented Bally "Speed-Lok" construction makes it easy to add sections to increase size . . . equally easy to disassemble for relocation. Four inch urethane insulation "foamed-in-place" (equal to 8½" of fiberglass) shrugs off high temperatures and Bally Walks-In operate efficiently located adjacent to kitchen ranges . . . or outdoors exposed to hot summer sun. 76 models and sizes of self-contained refrigeration systems are made to fit every individual need. Send to Bally Case and Cooler, Inc., Bally, Pa. 19503, for 32-page catalog and urethane wall sample.

There's an evolution in the kitchen

For more data, circle 46 on inquiry card
The place: The 24-story St. Paul Hilton
St. Paul, Minnesota

The people: The Hilton Organization

The carpet: For beauty and durability, specially-designed Wiltons were installed in the main ballroom and “Top of the Hilton.” Carpeting in the 2nd Floor lobby is also Bigelow.

Bigelow: Why do people like The Hilton Organization specify Bigelow? Because they know that for every hotel, motel, hospital or commercial building Bigelow has or can custom-create the perfect carpet. We’ve done it since 1825. Our carpet counselors will give you all the help you need in solving any kind of carpet problem—at no charge. Simply call your nearest Bigelow sales office. Or for a colorful, free brochure on commercial carpets, write Dept. A, 140 Madison Avenue, New York, N.Y. Find out for yourself why people who know buy Bigelow.

For more data, circle 47 on inquiry card
These **SMITH WALLS** show architectural ingenuity

The contrasting colors . . . the different panel profiles . . . are tastefully combined with each other. And with other building components of masonry and glass. The result shows architectural ingenuity. It also shows the design freedom you can exercise with Smith Walls.

So let your imagination be your guide. We'll custom-engineer Smith Metal Walls to your design . . . and your exacting specifications.

But custom-engineering is only the beginning of our Single Responsibility concept. Smith Walls are fabricated, delivered and erected by our own people . . . on a firm schedule . . . under rigid experience-established procedures that assure customer satisfaction. We control every sequence of the operation. This guarantees a smooth, efficient installation. Cuts erection time and holds down costs.

Smith Walls can fit into your plans.
Specify Smith Walls in place for your next project . . . whether it's a single building or complete complex . . . new construction or remodeling.

For complete information, including specifications, check Sweets' File or write to:

**ELWIN G. SMITH & COMPANY, INC.** Pittsburgh, Pa. 15202 / Atlanta • Boston
Chicago • Cleveland • Cincinnati • Dallas • Detroit • Philadelphia • Toledo • New York

For more data, circle 48 on inquiry card
When the Port of San Francisco opens its new Army Street Terminal for business every morning, Cookson opens the doors. And closes them again at night.

155 Cookson power-operated steel rolling doors provide easy access to, and complete security for, the $25 million installation's 820,000 square feet of enclosed cargo handling and storage facilities.

And every one secured by a Cookson steel rolling door

On the basis of quality, operating ease, reliability and cost, the Port of San Francisco's choice of Cookson power-operated rolling steel doors was an open and shut case.

"Best Way to Close an Opening"

The Cookson Company
700 Pennsylvania Ave., San Francisco, Cal. 94107

For more data, circle 49 on inquiry card

For more data, circle 50 on inquiry card
Something to ease your mind while you wait for the birth of your new building:

We've been through it 4000 times.

The birth of a new building is always a nervous event. We know. Honeywell has shared the experience with over 4000 building owners and architects... we have installed one man building control in over 4000 buildings of all types and sizes.

This experience has taught us just how much automation you'll need for the lowest first cost and greatest operating efficiency.

If you'd like to know more about how Honeywell's experience can save your clients money on the complete building automation system, send for our free Planning Guide on Automation. Write Honeywell, Commercial Division, Dept. G6118, Minneapolis, Minnesota 55408.
How does this “hidden persuader” make the Titus T-LINE Air Diffusing Ceiling 100% more functional, yet give it greatest architectural beauty of any ceiling?
It nestles (out of sight) above the air slot of T-LINE, gives greatest air distribution control of any ceiling system. Look what T-LINE'S "hidden persuader" can do: Adjust the air pattern a full 180°. Full horizontal discharge, left or right. Full vertical discharge. Or any pattern in between. And provide complete air flow rate control — even blank-off!

WHAT DOES THIS MEAN? When you use T-LINE, you can be sure it will provide the efficiency and flexibility of air distribution to fully satisfy any present or future room requirements.

FOR EXAMPLE: If movable partitions (which quickly, easily affix to T-LINE channels for support) need to be rearranged to meet changed space requirements, T-LINE can provide the necessary air distribution to fully meet the new requirements without disturbing the ceiling in any way!

No other ceiling system allows such freedom of architectural ceiling design. T-LINE can be furnished in any size module — can be used with any kind or size ceiling panels, or any type lighting.

REMEMBER: You don't gamble or compromise on the air distribution when you use Titus! T-LINE Ceiling Systems are performance proven. First, by testing in the Titus Air-Diffusion-Council-Certified Research Laboratories — and then in many, many installations throughout the United States and Canada.
University of Tennessee Student Aquatic Center Chooses Bowser-Briggs Swimming Pool Filters

“Fun for Everyone” (the official motto) is the best description of the outstanding new $1.7 million Student Aquatic Center at the University of Tennessee. Consisting of two 50 meter Olympic pools (indoor and outdoor), a separate 15 foot deep indoor diving well, sundeck area, weight room, sauna baths, dance area, game rooms and lounges, the new center has been described as the most advanced in the nation.

It was fun, too, for Bowser-Briggs to install the 2 huge model 618A vacuum filters, each providing 1008 sq. ft. of filter area—with maximum flow rate of 2000 gal/min in an 8 hour turnover. Each filtering system also is equipped with a Bowser-Briggs dry feeder to feed DE slurry into the system. During periods of heaviest load, filtering cycles have been experienced up to 28 days.

Why not consider Bowser-Briggs superior filtration systems for your next pool. Write today for complete information on our latest filtration systems.

For more data, circle 52 on inquiry card
The Heroic Carpet

It'll give your floor a lift. Carpets of well-muscled, hefty HERCULON® olefin fiber are made to stand-up under heavy use. Even in a gym. Dirt, grime and stains stay near the surface where quick and easy maintenance carts them away. So, put down carpet of HERCULON where strength and vitality are needed. To find out why HERCULON is made to "take it," contact: Fibers Merchandising, Hercules Incorporated, Wilmington, Delaware 19899.

Since when? Since Herculon.

*Hercules registered trademark.
Why were Haughton Elevators with exclusive 1090 Computerized Control installed at the new Gulf Life Tower?

To insure the shortest trip time in elevatoring

The remarkable Haughton 1090 Elevator Control System doesn’t “freeze” cars in inflexible zones.

That means cars are free to move precisely in accordance with traffic demands.

For example: Should traffic increase in one section of the building (say between floors 8 and 12) the 1090 System automatically directs the required number of cars to the busy area.

Thus cars don’t cruise aimlessly up and down, or park in one section of the building when they are needed elsewhere.

Because the Haughton 1090 System makes possible the most efficient utilization of every car in the system, the time between boarding an elevator and leaving it at the destination floor is always pleasantly short.

People like that. And it’s the kind of service they expect in prestige buildings.

1090 is a product of Elevonics* . . . our unique research and development program that looks beyond today to anticipate and satisfy your needs in vertical transportation.

Our 1090 System will keep new buildings new . . . and make old buildings young again. Ask your Haughton representative for complete details. Or write us.

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

For more data, circle 54 on inquiry card
Secretary Robert C. Weaver of the U.S. Department of Housing and Urban Development early last month announced the award of Model Cities planning grants to 33 communities in 26 states, bringing the number of awards so far to 108 cities. These cities have been chosen from 163 municipalities that applied last April to share in the $12 million appropriated by Congress for a second round of Model Cities planning grants.

Model Cities planning grants pay 80 per cent of the cost of planning a comprehensive five-year program to improve social, physical, and economic conditions in large blighted neighborhoods. After a year's planning period and approval of plans, cities will be eligible for Model Cities supplemental grants, as well as other Federal grants-in-aid to carry out their programs.

Seventy-five communities which received planning grants in the first round are now planning programs for their model neighborhoods. First plans from this group are expected this fall.

Taylor reviews ten months of Model Cities program

H. Ralph Taylor, HUD's Assistant Secretary for Model Cities and Governmental Relations, reviewed progress and problems of the first ten months of the Model Cities program before a Midwest regional conference in Dayton. Following is a summary of his remarks.

"The fundamental principle that citizens have a right to participate in and influence the development of plans that will affect their lives is no longer debatable. To achieve a working partnership between people and city government and a sharing of power, we must overcome two interrelated problems: the suspicion and hostility of citizens toward city officials and skepticism of public officials toward citizen aid in planning.

"Model Cities planning is an unprecedented process in which citizens and government, working together, look at the total urban problem as an interrelated whole. We hope to move away from a system of spending dollars on a series of scattered projects to a system that will let people of the neighborhood and government measure the value of dollars spent on urban problems in actual performance and reaching objectives. For the first time we will have an actual measure of total effort and cost of revitalizing a specific urban neighborhood.

"With the full cooperation of the Administration, we are working with the other departments and agencies concerned with urban problems. We are seeking four major changes that can be accomplished now without additional legislation: 1) A new pattern of technical assistance that will help city government and the citizen to better understand the possibilities of the various Federal programs and fund availability. 2) For this effort to succeed, there must be a substantial strengthening of the regional offices of the various Federal departments. This will require earmarking and allocating funds for regional commitment. 3) There has to be speedy and flexible processing, and recognition of priorities so that program components that relate to each other can be funded in an appropriate time sequence. 4) The fourth change is fundamental to the other three. Federal and state funds now flow into a city through a variety of channels, some of which have no relationship whatsoever to city government. As a result, there are very few mayors in this country who know the full extent and nature of the flow of Federal funds into their cities. The only effective solution to this problem in the model neighborhood area is to condition the approval of Federal grants upon the participation in the planning process for the model neighborhood of the local recipient of the Federal funds that are to be used in a project in or substantially affecting the model neighborhood. This means more than a check-point procedure; it requires joint planning so that all Federal and, hopefully, state funds that go into a neighborhood relate to the strategy and the plan for that neighborhood."

Document outlines A/E-government relationship

A four-year effort by the military services of the government and the professional societies (A.I.A., C.E.S., N.S.P.E.) has culminated in the revision of a document originally published by A.I.A. in 1967.

The pamphlet is entitled "The Architect-Engineer and the Military Services: A Working Relationship." It presents a current understanding of the basic responsibilities of each party to the A/E-government relationship. Further talks between the societies and the services will be conducted to expand upon the common ground. The publication will serve as a precedent in negotiations for similar understandings with other Federal construction agencies.
VA relaxes 6 per cent fee limitation on A/E contracts

The Veterans Administration no longer will require that all architect-engineer services be included in determining compensation covered by the 6 per cent fee limitation set forth in Federal statutes for A/E services.

VA revised a previous regulation which held that all compensation, including reimbursement of the A/E for travel to and from the job site, would be considered in determining whether or not a contract exceeded the Federal maximum of 6 per cent of estimated construction cost. The action came when the General Accounting Office told VA it would “have no objection if the . . . regulation is cancelled for the time being.”

The VA ruling does not change the application of the 6 per cent maximum to preparation of design and plans.

GAO stands by while Congress studies

VA was the only Federal agency which had complied with last year’s GAO opinion that A/E fees be limited to 6 per cent of construction costs, and that such fees include all services from feasibility through supervision, including travel, receiving a certificate and is then qualified for a job.

David L. Eggers says of the program: “Since the program only began a short time ago, I can attest to our own hopes rather than report on specific results. I believe our new venture makes business sense, and I know it is consistent with our obligation to foster architectural education and betterment. I cannot claim that we were impelled solely by altruism in creating the program, nor can I present it as a dramatic solution to social needs. I would hope, however, that we have unlocked one door that must be opened, and that our idea will take hold in the profession.”

New York architectural firm trains disadvantaged youth

A career opportunity program for disadvantaged youth from New York has been undertaken by Eggers and Higgins. The architectural firm has set up a classroom in its offices for an initial class of ten young men and one young lady, who, over a period of 16 weeks, will be taught the fundamentals of architectural drafting and the language of structures.

After completion of training, the beginner is qualified for a draftsman’s position at Eggers and Higgins, or elsewhere in the profession. The program is offered in cooperation with Vocational Foundation, Inc., an agency which is supported by private endowments and some Federal funds. The foundation screened the applicants through counseling and testing and contributes to a part of the salary costs of students.

Trainees receive a 16-week course of instruction plus a salary. The salary ($80 a week of which $25 is reimbursed to the firm by the foundation) is above the level of wages for unskilled labor and makes education a financial possibility for the trainee.

Joseph Rivellese, instructor of architectural and engineering drawing at State University of New York Urban Center in Brooklyn, has begun by teaching trainees the language of structures and other practical subjects with an emphasis on graphics. The graduate of the program receives a certificate and is then qualified for a job.

Briefs

Liability defense material is being developed by the Risk Analysis and Research Corporation, a new San Francisco-based firm which studies liability claims involving design professionals to develop loss prevention remedies. They are now preparing a manual for C.E.C.

August Hoeck received an award in recognition of “distinguished contribution to hospitals and to the health of the American people” from the American Association for Hospital Planning at the September meeting of A.H.A. Mr. Hoeck, recently retired chief of the architectural and engineering branch of the Public Health Service Division of Hospital and Medical Facilities, is now the Washington-based associate of Jensen, Halstead and Rummel.

Revision of a bidding procedures guide is now being reviewed by a joint committee of A.I.A. and A.G.C. The guide should be available to chapters and members before the end of the year.

Government rules against package deals

The Secretary of Defense has announced construction contracts will no longer be awarded to the same firm which designed the project or to any of its subsidiaries or affiliates.

A July 17 revision to the Armed Forces Procurement Regulations instructs Federal contracting officers to inform architect-engineers of this restriction prior to commencement of negotiations for A/E services.

While no explanation is given as to the reason for the new regulation, other amendments issued on July 17 encompass procedures to avoid “buying in” on projects. “Buying in” refers to the practice of knowingly offering a price or cost estimate less than anticipated costs with the expectation of receiving more profitable “follow on” contracts, or with the intent of increasing contract price or costs through change orders.

Education for design to be joint conference theme

Sponsors of a conference on education for environmental design November 11-13 at the University of Notre Dame will be the Interprofessional Commission on Environmental Design, whose members represent the American Institute of Architects, American Institute of Planners, American Society of Civil Engineers, American Society of Landscape Architects, Consulting Engineers Council and the National Society of Professional Engineers. Purpose of the conference is to discuss common bonds of education for environmental design among the I.C.E.D. professions. It will deal with the present status of education for environmental design, explore its shortcomings, review trends and set guidelines. This year’s I.C.E.D. chairman is C.E.C. past president Eugene Waggoner. Attendance at the conference will be by invitation to about 30 delegates from each society.

82 ARCHITECTURAL RECORD October 1968
Changing age distribution sparks apartment boom

1968 is The Year of The Monkey according to the Chinese lunar calendar. Builders and designers of apartment houses might well be prepared for the worst if they were superstitious, for so far this century each time The Year of The Monkey has rolled around (every twelve years), apartment building has taken a nosedive. Declines have ranged from 10 per cent in 1956 to over 80 per cent in 1932.

Apparently most architects, contractors and investors don't consult their lunar calendars before making plans, for 1968 is shaping up as a banner year for new apartment construction. The number of units put in place will approach the record of 535,000 set in 1963, while both valuation and apartment buildings' share of total residential construction will be at all-time highs.

The reasons why multi-family building has been able to shake off the "monkey jinx" are not hard to find. In the first place, the rate of new building during the past two or three years has been well below potential. Apartments suffered the same fate as other types of residential construction following the "credit crunch" of 1966 when mortgage funds became extremely scarce. In addition, the temporary suspension of the investment tax credit put a further damper on investment in large multi-family buildings. The result has been a substantial reduction in rental vacancy rates to the lowest level in the 1960's. Judging from recent sharp rental increases in many cities, the vacancy rate is below the most efficient level to handle normal turnover.

The major force behind the upsurge in apartment building, however, has come from some dramatic shifts in the demand patterns for housing in general. The biggest markets for multi-family dwelling units are young people who are moving away from home or graduating from college and setting up housekeeping; newly-marrieds and families with very young children; and older people whose children have grown up and left them with more space than they want to take care of. In broader terms, the 20-29 age group and those over 55 are more likely to rent an apartment than buy a house: It is precisely in these age groups that most of our population growth is taking place. Since 1960, while the total U.S. population has grown slightly over 10 per cent, the number over 55 has increased 15 per cent while the 20-29 age group has jumped almost 30 per cent. In 1967 alone, the combined growth of these apartment-oriented age brackets exceeded the gain for the country as a whole.

The impact of these population trends is showing up in regional building patterns. The far West and the Southwest, which led the tract-home boom of the 1950's, have now become the leaders in apartment construction — both in numbers and in share of total residential building. Such traditional single-family housing areas as Los Angeles, Seattle, Dallas and Atlanta are now building more apartments than one-unit structures.

How long will this apartment boom last? Population factors alone certainly indicate a healthy market for at least another decade. Over half the country's growth between 1968 and 1975 will be in the age groups favoring apartment living. Any shift from suburbs back to the city or widespread use of modular units, as many are predicting, would add strength to apartment building.
Keene imagination

SIMON FRASER UNIVERSITY POOL
VANCOUVER, B.C.
ARCHITECT: DUNCAN S. McNAB AND ASSOCIATES
VANCOUVER, B.C.
If you've ever tried to make yourself heard around a huge indoor swimming pool, you'll appreciate Keene's solution to a tough acoustical problem at Simon Fraser University, Vancouver. The highly reflective surfaces make speech and hearing practically impossible. That's why those Keene Sonosorbers are hanging from the ceiling. More than 100% sound absorption is obtained from each square foot of their surface area.

Whatever acoustical problem comes up, chances are Keene has come up with the product to solve it. Sonosorbers are just part of the biggest specialty line in the business.

The most versatile structural framing line in the business is Keene Speed-Steel™ chosen for the Atomic Energy Commission's Brookhaven Laboratory shown here. The only flat surface in the building is the floor, since all of the walls are sloping. In combination with precast concrete, Speed-Steel helped an imaginative concept take shape.

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If you've gotten the impression that Keene makes a diversified line of quality building products that may help on your next job, you're right.

For complete information on Keene acoustical products and a general catalog of Keene building products, write to Dept.A10, Keene B-E-H, 500 Breunig Avenue, Trenton, New Jersey 08602.

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For more data, circle 56 on inquiry card
The latest attempt to bring the architect's fee into line with the complexity of design comes from the Chicago Chapter of the American Institute of Architects. After three years of study, a committee of that chapter has indexed major building types and correlated them with a set of five charts of sliding scales shown below and on the following page.

The committee recommends that the charts be used in accordance with the provisions outlined in A.I.A. Document B-131, the Percentage of Construction Cost. This form of agreement is best suited to normal construction projects of definite scope, which require basic professional services through the five phases of development defined in the document. These phases are: schematic design, design development, construction documents, bidding and construction.

There is some latitude for additional costs

The architect's fee (under the standard conditions of B-131 as modified by the Chicago study) is calculated as a percentage of the total project construction cost using the applicable graph for the building type involved. To this figure should be added the cost of reimbursable expenses such as transportation, long-distance communication, reproduction of contract documents, model photographs, renderings and detailed cost estimates. Extraordinary engineering or special consulting expenses may also be added onto the architect's total fee if such extra services are specifically defined in the architect's contract.

For extended services, a different fee structure applies

Fee standards for additional services are not specifically covered in the percentage charts of the Chicago study. Services in this category which should be negotiated separately include: master planning, feasibility and other special studies, extensive revisions to approved drawings and documents, consultation services, interior design and arbitration proceedings.

Alternate fee contracts tailored to special cases

The two other methods of computation outlined in A.I.A. standard forms are recommended by the Chicago committee for use when percentage calculations would be cumbersome or when the work deviates sharply from the construction norm. Remodeling, reconstruction and interior design projects, for example, often adapt best to a compensation agreement based on A.I.A. Document B-231, the Multiple of Direct Personnel Expense. Compensation is based on the direct expense of personnel engaged in the work plus reimbursable expenses. Total expenses are to be multiplied by a minimum factor of 2.5 according to the A.I.A. document. The Chicago Chapter recommends that the factor be 3.0, and further stipulates that principals' direct expenses be part of the total.

When the extent of the architect's services can be determined accurately in advance, the Chicago Chapter suggests that compensation be established as a fixed professional fee plus direct expenses as outlined in Document B-331.

**Graphs:**

A. Single-family residence

B. Banks, churches, concert halls, hospitals, laboratories, etc.
C Schedule

Construction Cost in Millions of Dollars

C. Airport buildings, auditoriums, court houses, office buildings, etc.

D Schedule

Construction Cost in Millions of Dollars

D. Apartment houses, hotels, industrial buildings, laundries, etc.

E Schedule

Construction Cost in Millions of Dollars

E. Garages, packing plants, parking structures, warehouses, etc.

Index of Applicable Schedule Graphs

Building Type | Schedule
--- | ---
Administration building | C
Airport hangar | C
Airport terminal | C
Airport tower | C
Apartment (high rise) | D
Apartment hotel | B
Aquarium | B
Armory | C
Auditorium | C

SPECIALTY

Bakery | C
Band shell | B
Bank | C
Bowling alley | C
Brewery | C
Bus terminal | D
Cafeteria | D

SPECIAL

Chapel | B
Church | B
Clinic | B

RECREATION

Club—city or country | B
College or university | B
School—elementary | C
School—secondary | C
School—junior high | C
School—senior high | C

OFFICE

Sales agencies (auto-boat, etc.) | D
Savings & Loan building | B

APARTMENT

Hotels | B

COMMUNICATION

Radio station | B
Television station | B

RESIDENCE

Development type | D
Single family | D

REASSESSMENT

Restaurant | B

SAFETY

Police station | C
Post office | C
Prison | C

RESEARCH

Research & data center | B

FINANCIAL

State capitol | B

STORAGE

Storage—cold | B
Storage building | B

ARCHITECTURAL RECORD October 1968
INDEXES AND INDICATORS
William H. Edgerton
Manager Dodge Building Cost Services
McGraw-Hill Information Systems Company

OCTOBER 1968 BUILDING COST INDEXES

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

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

Costs in a given city for a certain period may be compared with costs in another period by dividing one index into the other, if the index for a city for one period (200.0) divided by the index for a second period (150.0) equals 133%, the costs in the one period are 33% higher than the costs in the other. Also, second period costs are 72% of those in the first period (150.0-200.0=75%) or they are 25% lower in the second city.

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"We were interested in a quality, long life, maintenance-free material that would also be a neutral element in any color coordination.

"These qualities were immediately apparent in lead-coated copper and the finished product indicates that the original idea was well considered."

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*Information Services, New York Department of Water Supply

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For more data, circle 72 on inquiry card

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ARCHITECTURAL RECORD October 1968 109
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DESIGNED FOR MOBILITY, BOTH SOCIAL AND PHYSICAL: THREE COLLEGES BY GUNNAR BIRKERTS

Tougaloo College, Glen Oaks Community College and the Vocational Technical Institute of Southern Illinois University all possess in common several important characteristics which typify architect Birkerts' approach to large-scale design. Each college can expand almost indefinitely—to accommodate unpredictable needs—within its essential architectural framework. All three are technologically advanced in their structure, and one, Glen Oaks, can be taken down and re-erected elsewhere. The colleges are all in rural settings, yet each is dense, tightly knit and urban in quality. Each is essentially a small city—with the attributes of a medieval town—where the functions of eating, sleeping, study and play tend to be zoned vertically rather than horizontally and are thus interwoven rather than separate, providing wide opportunity for varied human relationships. Distances to be covered are shorter, and campus spaces are small-scaled and intimate. From a distance, however, each campus presents a bold and memorable image. Birkerts points out that for a majority of the students in all three colleges, the campus is a way station from a simple rural life to the urban environment into which their careers will take them. In his hands these way stations are becoming models of city life as it should be.

—Mildred F. Schmertz
The three layers of the system:

**Top Layer:** Dormitory buildings and upper level circulation

**Middle Layer:** Academic facilities and pedestrian circulation

**Ground Layer:** Roads and parking

This century-old Negro college near Jackson, Mississippi plans to expand from its present small enrollment of a few hundred students to a student body of 1250 students which will soon grow to 2500 and then expand indefinitely. Because the present campus (shown at top right) is badly deteriorated, a major program of new construction is planned. The Cummins Foundation engaged Birkerts to develop building prototypes within a master plan which would permit a flexible growth process.

Birkerts chose to develop a high-density, tightly-knit urban framework that can expand in any direction. As the site plan (opposite page) and the diagrams (left) indicate, the campus is zoned in three layers that follow the slope of the hill. Roads and parking comprise the lowest layer, following the contours at the base of the hill and passing under the academic and dormitory structures which are supported on bell-bottomed piles because of soil conditions. The middle layer contains the academic matrix, plazas and other pedestrian paths. The top layer of dormitories ride across the roof-tops of the academic matrix. Just below each dormitory floor and parallel to it is a suspended and open pedestrian passageway (see drawings overleaf) connecting, by means of roof-top paths, to the academic and social areas below. Since these major campus elements are stacked vertically in a close web, walking distances are quite short and a high degree of interaction among the students and faculty can take place. The dormitories in their roof-top position are still remote enough, however, to permit necessary individual privacy. For the campus pedestrian, the open spaces will be small and hospitable. As seen from the highways, however, Tougaloo's interpenetrating planes as arranged on the slopes of the hill will combine to form a boldly scaled image.

The basic dormitory module consists of three 30-foot by 12 foot 2 inch structural bays (shown above). The rooms cantilever in both directions to a total width of 31 feet 6 inches. Each bay consists of a segment of the open pedestrian passageway and two floors which combine bedroom, toilet and lounge spaces. On the first dormitory floor these lounge spaces are on the exterior wall, and on the second they are located within the core. The broad panes of glass that provide views from the perimeter lounges combine with the more complex fenestration of the dormitory rooms to form an unusually rich and varied facade (far left). The dormitory rooms (below) incorporate ingenious space-saving ideas. Because the clay sub-soil at Tougaloo is unstable, every building will be constructed on poured concrete caissons, with all structural members raised free of the ground. Columns and seats will be of poured concrete and the rest will be precast. The academic matrix shown in plan and section (above left) can accommodate within its 30-foot-square module the great variety of teaching spaces and other campus facilities required.
The library, on its 30-foot bays, is a prototype for the academic matrix. Since all columns, column seats and precast beams are visible, the structural system can be read at any point from the exterior or interior. V-shaped windows expose the structural column. Suspended ceilings respect the bay module which will be outlined by recessed lighting troffers. The plans and section show an unusual juxtaposition of two-story bays. From the main floor one ascends a stair through one two-story space and arrives at another on the second floor. From here one progresses to the third floor by means of a staircase which rises through still another two-story bay to arrive at a final great vertical space.
GLEN OAKS

The first stage of this two-year community college in St. Joseph County, Michigan, is nearing completion. The master plan provides classroom, laboratory and related facilities for an anticipated enrollment of 2500, but allows for virtually unlimited growth and the possibility of future student housing. The first stage accommodates 600 to 800 students. The site plan and section (left) indicates 300 acres of cleared and wooded land including level farm land, a swampy low area and a hill covered with a beautiful stand of oaks. The high flat land is used for parking, while the entrance road cuts through the edge of the swampy area forming a dam which will create a lake from the natural drainage. The college is prominently located in a clearing at the top of the hill.

Designed for year-round use as a cultural center as well as a college facility, the new structure will accommodate almost any type of growth—predictable or unforeseen. At any growth stage, including the first, the design should appear "complete." Birkerts has devised a space and structural module which accepts nearly any space requirement, and a system of construction which, through use of large, movable precast exterior wall sections, allows growth in any direction. Only one element of the design solution is fixed—the main axis of the complex, a large visually-powerful area to which all other changeable areas of the building relate.

Gross area of the first stage of construction is approximately 120,000 square feet. Cost of this stage, including many features that will not be repeated as growth takes place (initial site development, well, sewage system, primary power) is approximately $3.5 million.

Glen Oaks, like Tougaloo, is on a 30-foot-square module. The first stage is shown cross-hatched in the plans above. It includes the square bridge (1), the main concourse (2), the lecture hall (3), the library (4), the cafeteria (5), the gymnasium (6), music and automotive lab (7), and the mechanical room (8). The first classrooms will be added at (9). Toilets and mechanical areas are located within the main concourse. Future staging is hypothetical. Added elements will grow along the spine, then expand outward.
The structural frame is poured-in-place concrete. Where exposed it will have a board-formed finish. Floor and ceilings are precast double tees. The precast, relocatable wall panels are 5 feet wide and moveable in 5-foot segments as shown in the isometric (right). They are surfaced in salt-glazed silo tile with a 5-inch-wide vertical joint every 2 feet 6 inches. The window units can also be relocated. Salt-glazed tile and gypsum partitions are used on the interior. Ceilings are exposed concrete and acoustic tile.
VOCATIONAL TECHNICAL INSTITUTE

This two-year college, part of Southern Illinois University, is located eight miles east of the main campus at Carbondale, Illinois, in World War II army ordnance buildings which will be phased out. The basic design concept is capable of unlimited growth in response to demands which are at present unpredictable. The scheme is organized about a diagonal spine (2) one story above ground level which encloses the main pedestrian concourse and principal entrance (1). This spine is oriented toward the main vehicular approach.

The program consists of three types of spaces—the teaching facilities, the common facilities and the student housing. The instructional facilities consist of four basic disciplines, each of which are located in one of four fingers which project to the south from the main triangle of the campus. These facilities consist of engineering and data processing (11), health (12), electronics (13), and graphics (14).

The common facilities include administration (3), technical resources center (4), auditorium (5), library (6), instructional aids (7), recreational facilities (8), food service and student center (9), and a central power plant (10).

Because Birkerts wishes to create a closely knit urban campus, students will be housed in high-rise dormitories (15) which will be located at the intersections of the specialized academic wings and the campus concourse.

The potential of a 44-acre site in a residential suburb was used to develop a remarkable working environment in this new corporate headquarters for Scott, Foresman and Company, a large publisher of educational materials. The architects and their interior design subsidiary—ISD Incorporated—were commissioned to program and plan the buildings with the interiors as direct extensions of the architecture. Further, great stress was made in the program for the use of materials, scale and landscaping that would be compatible with both rather special working needs and the neighborhood. Thus, although the company is a sizeable one—with most functions inter-related—an analysis proved the feasibility of dividing functions into four linked buildings in a campus-like cluster around courtyards.

SCOTT, FORESMAN AND COMPANY,
In an almost idealized “bubble chart” fashion, publishing facilities in this complex are grouped into four buildings (executive functions, distribution and customer service, editorial, and central services and dining), all linked by glassed-in corridors or bridges at the appropriate levels. The areas between have been landscaped into very attractive and usable courts: view A (above left) is from the executive building, across a pool-centered mall to the editorial building; B is the same area, from the opposite direction, and shows the outdoor stairs leading to the lower-level editorial court shown in view C. A tree-studded court, D, separates the executive unit from the central building with dining facilities on ground level and library and meeting rooms on the upper level. Basic materials are brick and concrete.
All interiors (public areas and work spaces) have considerable spatial interest and views to the landscaped gardens. The main reception hall, E, in the executive building soars full height to a faceted skylight topping the administration floor, J. The library, F, and art departments, H, are in the central services building for easy access from all departments. Offices for the editors, as in photo G, open on more private gardens and a lower-level court. Only the perimeter walls, walls of the executive offices, and the mechanical cores are permanent—all other interior walls are moveable steel partitions set in channels laid on top of carpeting. White, gray and brown are dominant colors.
PRIVACY FOR HOUSE ON NARROW LOT

"The basic construction of this house is as simple as it could be made; bearing block walls, flat roof, and stock casement windows all make it pretty standard." Architect Seibert further states that his reason for keeping construction simple was to give the client architecture for a "builder price".

With only a narrow, 50-foot-wide lot to work with, Mr. Seibert used the heavily-planted neighboring lots for the view from the living room and porch, but the remainder of the spacious four-bedroom house turns inward, one wing to the walled court off the sitting room. All windows, except the large ones in the living room, are shielded from the sun by louvered shutters, giving the house a regional flavor and a sense of self-containment. Exclusive of the lot, the house cost $37,000 air-conditioned.

The plan, at left, shows how the living room and porch serve as a meeting ground for the two living wings. The photo below was taken from the street side of the house.
On the exterior, the stucco applied over concrete block adds to the regional quality of the house. The sphere seen in the photos at left is a lamp. Many more plantings are planned to shield the house from its neighbors.

Ceilings and interior walls are drywall, while the roof is wood-framed, built-up.

The comfortably furnished interior is fully air-conditioned. The walled court shows in the photo, right.
LAKESIDE HOUSE OPENS TO THE VIEW

With its almost solid rear wall and open front, this house focuses the inhabitant’s view onto the lake it sits aside. The near-solid side, punctured by the front door (see photo, lower right), faces the road, so windows were kept to a minimum.

With some of the same devices as the Seibert house—concrete-block bearing walls; flat, wood-framed built-up roof—the architects have kept costs down, in this case to $24,000. Much was saved by leaving the block exposed on both sides and coating it with a moisture sealant. Many fine details (framing the windows with block projections, the porches, and the slit windows surrounding the fireplace to create a free-standing effect) coalesce to form a very livable sculpture in exposed block.


Capitalizing on the rectilinear confines of the material, the house presents many hard-edge faces to catch sun and shadow. Because it is situated in a remote area surrounded by trees and is only used on weekends, the house was constructed mostly of fireproof materials.

When the sliding glass doors are opened, the floor-level porches become extensions of the interior and relate it to the beautiful site.
Each of the two bedrooms has large expanses of window, a feature which is in tune with the openness of the rest of the house. The kitchen will eventually be closed off from the living and dining rooms by folding wooden doors. Floors are oak; ceilings and some interior walls are gypsum board. Two exposed and stained wood beams in the living room are a good contrast to the concrete block.
ELEGANT SMALL BUILDING FOR A TOWN BANK

Set among small shops, this inviting bank attracts one's eye while fitting quietly into the busy shopping street on which it stands. Fine use of forms, colors, and materials results in its unobtrusive elegance.

Colors are predominantly white, black and grey, offset in the interior by bright paintings and the warmth of finished wood. The white exterior is stucco over plywood.

Since the building faces two streets, the two entrances become a passageway and a clear opening through the building. A slope in the ground level allows an extra one-half level to be exposed in the rear. All details such as the raised white graphics and the interiors were controlled by the architect.

Looking from the bank president’s office out to the bank, in the photo upper right, one can see the handsome partition detailing and the free-standing cabinet, which, like the bank furniture in the photo above, was designed by the architect.

The slate tiles used on the sidewalk were also used in the bank and on the rear steps (photo opposite). Sharply detailed, with file cabinets built into the wall, the office in the photo at right is on the second floor in the rear.

Natural light is everywhere a dominant feature of the design, travelling over and through the partitions and window walls.

The abundance of light, the white walls, the splashes of brilliant color, and the richness of the furnishings all coalesce to form a very pleasant working atmosphere.

The floors are carpeted in all office spaces, and slate-grey tile is used in all public spaces.
CRISP SMALL BUILDING FOR AN AUTO DEALERSHIP

The plan consists of three major elements (showroom and offices, service department, and parts department) which are related to each other for centralized control of all activities from the service office.

Offices and a customers' lounge are adjacent to a two-story showroom which is surrounded by steel-framed glass walls. These are the only public spaces. Above the offices are an employees' locker room, lunch rooms, and storage space. Behind the offices and contiguous with the service area is the parts department.

The service area was designed as a clear space, without columns, and is spanned by open-web steel beams on concrete-block bearing walls. A layer of stucco was sprayed over the block on the exterior. Since there are no windows in this wing, natural light was introduced through a series of clear plastic skylights. Building cost was $180,000.

VOLKSWAGEN SALES AND SERVICE BUILDING, Maplewood, New Jersey. Architects and structural engineers: Collins, Uhl & Hoisington; mechanical engineers: Paul Kopf; contractor: Rosedale Contracting Co, Inc.
The interior walls of the showroom and offices, photo at right, are finished with drywall, while the remaining walls were left exposed-concrete block and painted.

By using a "T"-shaped building on the limited downtown lot, the architects were able to design off-street parking for customers and employees into the plan.

The detail photo, below, shows how the architect integrated the company logo into the design to avoid the standard street sign.
RUGGED SMALL BUILDINGS FOR A MARINA

The Harbormaster's building (above and far right) functions both as office space and observation tower. The other buildings in the complex—such as the small maintenance and restroom building at right—are similar in materials and design.

All buildings are intended to reflect the tradition of the waterfront, with the use of heavy timber, weathered wood pilings, and natural earth colors to achieve a salty, rugged appearance. Each structure consists of pole columns, timber beams, and timber floor and roof decks. The wood and glass walls are hung within this frame to allow for shrinkage movement as well as wind and settlement deformations.

Exterior walls are grey-stained redwood siding; poles are charcoal brown, and the roofs are brick-red gravel. Interior walls are finished the same as the exterior; floors are oak, and the wood ceilings are stained blue-green.

The harbor pilings in the photo at left are reflected in the detailing of each building. As parts of a master plan which called for several individual areas of activity within the marina (see next page for the master plan), the buildings stand as focal points of these pockets of activity. By separating functions in this way, sight lines to the water were kept open rather than cut off by a solid row of waterfront buildings. All utilities were placed underground.
The plan shows the total marina development. A is the Harbormaster’s building, and B are the restrooms. In order to free more land for beaches, walks, park area, dining and picnic facilities, related activities were clustered around malls. The photo is of a typical building detail.
Two years ago the American Institute of Architects asked Robert Geddes, Dean, and Bernard Spring, Senior Research Associate, of the Princeton School of Architecture, to look into the state of American architectural education, with its ever-changing courses, rapid turnover in deans and chairmen, and its increasingly militant students. The A.I.A. hoped that the Princeton educators could explain some persistent questions, such as why American architectural education combines an extraordinarily high attrition rate (frequently two-thirds of an entering class will fail to graduate on schedule) with a rather low level of professional acceptance (for example, with a few minor exceptions, no state grants architectural graduates exemption from a registration examination).

The A.I.A. also hoped that the study would bring the profession and the schools closer together, by supplanting the stereotype views that the schools are "impractical" and the profession "not interested in the art of architecture."

It is not surprising that the completed report should have turned out to be a controversial document, but the real subjects of controversy have been somewhat obscured by the reaction to the report itself. Very brief, and very abstract, the report resolutely refrains from using the words "architect" or "architecture," and often makes use of the arcane language of system analysis. By raising more questions than it attempts to answer, the report's initial effect has been to drive the profession and the schools even farther apart.

The A.I.A.'s official reaction to the report has been an uneasy series of "clarifying" press releases, mixed with statements that additional, supplementary studies are already in progress. The normally placid Association of Collegiate Schools of Architecture has become more stirred up than anyone can remember, and it passed a resolution at its Portland convention which amounted to a complete rejection of the A.I.A. report.

Some part of the controversy really seems to be the fault of the report's format, rather than its content. After two years, and $100,000, one is inclined to expect a somewhat more substantial looking result than a bare 56 widely-margined pages; and the "systems" language has a tendency to offend architect and educator alike, with its implied assertion that the cause of all problems in architectural education is simply sloppy thinking. It is clearly worth putting any such initial prejudice aside, in order to consider the report on its own terms.

Even so, the Princeton report is still an unconventional document. Orthodox systems thinking requires three stages: system definition, system analysis, and system design. The A.I.A. report goes deeply into system definition, provides the reader with analysis of only the most general kind, and then sketches in the outline of a design, leaving all the details for future study.

The basic assumption of the report is that the design of buildings, structural engineering, landscape architecture, city planning, product styling, graphics, and other design disciplines are all part of a single profession (or system), which Messrs. Geddes and Spring elect to call "Environmental Design." As a theory this concept has a deceptively self-evident ring about it, particularly to those architects who feel that their training already qualifies them to design anything from a hawk to a handsaw. In practice, of course, such a concept runs afoul of registration laws, professional jealousies, and basic differences in talent and temperament.

In order to get a grip on the question of what actually constitutes "Environmental Design," the Princeton study sought a definition based on actual performance, rather than traditional notions about different disciplines. This approach led to a series of definitions based on six stages of the design process, six levels of implementation from basic research to final construction, and six different scales from component to region.
Is “Environmental Design” different from architecture—who will practice it and how will he be registered?

The result was a definition of 216 tasks (6x6x6) that comprise “Environmental Design.” Thus we have a system of thought that has a place for the engineer designing a bridge or the financial planner designing a bond issue for a housing program. In other words, “Environmental Design” comprises a far wider range of tasks than traditional concepts of Architecture; and a meaningful discussion of architectural education should take this larger context into account. The authors go one step farther, however: they cease talking about architecture as a separate profession and choose to consider only “Environmental Design.”

One wonders just how helpful this definition of the design professions as a system will really prove to be. There is a deeply ingrained belief in the American academic community that to define a problem correctly is to go a long way toward a solution. The emphasis on definition in the A.I.A. report clearly comes from a belief that a new conceptual framework will help achieve a new consensus. In the case of a large generic problem and a large generic definition, however, there is some doubt just how much practical effect a new concept can have, particularly if the immediate result is to hit the average professional right in the checkbook. If the A.I.A. takes the concept of “environmental design” seriously, there is no question that it is proposing something that is profoundly destructive of registration laws and other existing forms of professional protection.

Thus we come to the question: who would practice environmental design, and what professional service should he offer? For an answer, we must analyze the system that Messrs. Geddes and Spring have defined, and unfortunately, at this critical point the Princeton report gives us very little assistance.

To analyze a system we need a lot of specific information, and specific information is just what this report doesn’t provide. Presumably, a large amount of the $100,000 went for data collection, but none of this data is reproduced. Readers who are both enterprising and patient can obtain copies of some of the study’s research materials that have been deposited at the Octagon in an undigested, unpublished form. (Ten cents a page, payable in advance, minimum order two dollars.) This material includes a compendium of curricula and statements on educational policies and objectives of the nation’s architectural schools, and eight pages of responses by practitioners to a questionnaire sent out by the study. The authors left out this material, apparently in the interests of readability, or possibly for lack of relevance. In either case, the reader who agrees with the report must take its conclusions on faith; the reader who does not agree may well feel that he is not getting very much for his money.

If the list of research materials is complete, the authors incorporated a great many related disciplines into “Environmental Design” without consulting educators and practitioners in these allied fields. This circumstance makes “Environmental Design” something of an a priori conclusion. Engineering education, just to take one example, has its own vexed issues, notably the conflict between “scientific” and “applied” studies. It would be rather sad if, when the architect finally gets around to inviting the engineer to be his partner in environmental design, he should be told that the design problems involved are trivial, and of no professional interest.

Let us return to our original question: who will practice “Environmental Design,” what kind of service will he offer, and, of course, how shall he be trained? The report has not told us how many people enroll in architectural schools, how many finish, or what they study while they are there. We also have no idea of the numbers enrolled in allied fields of education, or what the areas of overlap between curricula might be. Nor do we learn anything from this report about current professional practice: how many firms are practicing a kind of environmental design now, what has been the training of these practitioners, what training do these profes-
involved with real situations, particularly those including social problems. Based on emulation don't meet new problems. Why expensive, nation-wide surveys are easy; but isn't that precisely the reason these students and the potential demand for their services are uncertain and frustrating, rather like opening a package and finding another wrapped package inside.

What kind of education fits a flexible framework—and who decides which subjects are essential?

The framework for environmental education is divided into six time modules (years—semesters). Each module has five possible programs, some of which are present in both early and late modules. This is certainly a much less rigid conceptual framework than the average curriculum, and it does admit of a great many permutations and combinations. Some of these permutations don't seem to make too much sense, like having your Professional Internship Period II before your Professional Education Cycle I, but it is impossible to evaluate this sequence without more information than the report offers. Certainly the five-faceted, six-jointed module is far from self-evidently correct. Why not more modules, of shorter duration, with more alternatives at earlier stages?

The relevance of the modular educational framework to the report's five problems of architectural education also remains somewhat obscure.

If a less rigid time schedule will help to bridge the gap between the school and the "outside world," it would be helpful to know what kind of studies really need to be sequential, and which do not.

What kind of general education or introduction to science will help bridge the gap between disciplines? Are we talking about special courses designed for "environmentalists" or rigorous introductions to separate subjects?

If traditional teaching methods no longer work, how should "Professional Education Cycle I" be taught?

Can the "real world" only be met through internship, or can it be incorporated in the curriculum?

Is a diverse and flexible education better in changing times than a thorough grounding in a few subjects?

Above all, who is to be taught what?—and where should he learn it?

The report assumes that the multiplicity of modular curricula will be too much for any one school, and that individual institutions should specialize within a national framework. This is a rational notion, comparable to suggesting to automobile manufacturers that they should each specialize in—and perfect—a particular kind of car. The question is, can one reasonably expect that such a situation could actually be achieved?

The report also assumes that each student will follow an individually tailored curriculum that will fit him for a specialized professional role. This is actually the reverse of today's pattern, where the architect learns his speciality in practice and has a generalized professional education. What is the irreducible amount of general training that an
CALCULATION OF THE NUMBER OF CAREERS POSSIBLE WITHIN THE MODULAR JOINTED STRUCTURE OF ENVIRONMENT DESIGN EDUCATION

Total possible programs = 938
Does not include options in professional cycles 2 and 3

<table>
<thead>
<tr>
<th>MODULE</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<td>1</td>
<td>20</td>
<td>4</td>
<td>20</td>
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<td>19</td>
</tr>
<tr>
<td>Professional Concentration: Cycle 2</td>
<td>8</td>
<td>12</td>
<td>21</td>
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<td>Professional Internship: Period 1</td>
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<td>44</td>
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<td>13</td>
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<td>Professional Internship: Period 11</td>
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<td>13</td>
<td>75</td>
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<td>130</td>
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<tr>
<td>total programs for each module</td>
<td>64</td>
<td>150</td>
<td>280</td>
<td>419</td>
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</tr>
</tbody>
</table>

"environmentalist" must have to function well in his speciality, and what happens if he wishes to change his role? Does he have to be "recycled"?

The authors do not answer these questions. Instead, they suggest ways for others to think about them, including "brainstorming" and the "critical incident technique." Needless to say, setting up guidelines for other peoples' intellectual experiences is a risky business at best. The following passage is quoted out of context, but it seems to epitomize perfectly the authors' attitude towards their readers:

"In designing experimental programs along the lines suggested above, it is useful to use the concepts of the three realms of learning or cognition identified by Jerome Bruner and his co-workers. Bruner's research indicates that there are three identifiable ways in which man perceives and deals with his environment. He terms these three modes of cognition the enactive (physical action), the iconic (direct imagery) and the symbolic (abstractions in the form of words and numbers). A well-balanced educational experience should not neglect experiences in every one of these three realms."

At the end, we are left with a need for more specific information, and, at the same time, a hope that the A.I.A. and the schools will be willing to take steps without waiting to see their own way clear to the end.

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Someone has to arrive at some reasonably compact and thoughtful evaluation of the present state of architectural education in this country. If deans and catalogues are unreliable sources, and it is necessary to send a trained researcher to every college campus, so be it. If we are talking about "environmental design," we need similar information for the other design professions as well. It would also be interesting to survey recent graduates, to see what they are doing with their training, and how appropriate they find it to be.

An accurate, agreed-upon description of the present state of architectural education is a necessary precondition to any substantial change. The Association of Collegiate Schools of Architecture can be forgiven for acting in a peevish fashion when confronted by a report that assumed that total change was needed, without specifying what was wrong, or what form the changes should take.

At the same time, if the A.I.A. is serious about the concept of environmental design and wishes to become the professional organization for a new, more inclusive discipline, it is time to start thinking about admitting other design professionals, like engineers or graphic designers, to full membership. And, if the A.I.A. seriously wishes the schools to move in the direction of an "environmentalist" curriculum, it can start putting pressure on the registration boards to change the scope of their requirements.

In any case, whoever you think of the A.I.A. report on education, it is clear that a great deal more work needs to be done.
Hospitals

Architecture's contribution to the control of rising medical costs is in the planning of hospitals for efficient operation and economic construction. Wilbur Taylor reviews some of the trends in Public Health Service approaches in the article below. And the exhibits which follow scan the evolution of inventive layout, from variations of the round nursing unit to the continuing search for efficiency and amenity through privacy and flexibility, as in Rex Allen's duoroom and other devices.

—William B. Foxhall

Needs, trends, and costs of hospitals and health facilities

By Wilbur R. Taylor

In the early days of the Hill-Burton program, the shortage of hospitals was so great that any hospital built anywhere fulfilled a vital purpose. Today, the increased complexity of health care, the growing population, and the population shift from rural to urban centers make the problems of providing adequate health care to all segments of the population seem almost insurmountable. Attempts to solve these problems have pointed out many needs which will have to be met, and some broad conclusions about possible new directions.

Regional planning is key to filling needs at lowest cost

The location of hospitals and health facilities and the services they will provide is of prime importance. Several mediocre hospitals in one area, each providing the same services, are both costly and inefficient. Facilities should be located where the need is greatest and where they can serve the greatest segment of population, and they should be able to provide comprehensive health services for the people. Local and areawide planning agencies working in close cooperation with state Hill-Burton agencies attempt to answer this need. Through grant programs, 70 areawide planning agencies have now been established, and the Comprehensive Health Services program of the Public Health Service was established to coordinate all the aspects of health planning.

Interrelated with the need for adequate planning for the location of facilities is the need for modernization and/or replacement of obsolete and inadequate hospitals and health facilities. Obsolescence of hospitals is caused not only by physical deterioration because of the passage of time, but also by functional obsolescence because of the many improvements in medical care techniques. These improvements make the modernization or replacement of facilities that serve as research and teaching centers imperative. However, the decision to modernize or replace a facility must be coordinated with the overall planning for health facilities of all kinds for the area.

Opportunities for economy are in diversity of services

The great demand for all kinds of health care today emphasizes the need for more diversified facilities for patients who do not require acute hospital care. Although the need for additional long-term care facilities, including nursing homes, has been recognized for more than a decade, this serious shortage has received even more widespread attention since the enactment of Medicare. These facilities can provide economical skilled nursing care for people who are ill, but who do not require the specialized services of the acute general hospital, and they are less expensive to construct, operate, and maintain.

The changing role of outpatient services in the health care concept has created many problems for outpatient departments of general hospitals. These departments are now an essential component of health services in the community. In the past, they have not been designed or located properly within the facility to take care of the many services they now try to provide. In the future, if outpatient departments continue to play the same role they do now, facilities will have to be larger, better designed, and better operated.

Functional design, shared services, and adequate funding can lower costs

The increasing cost of health care and of health facility construction makes mandatory the consideration of all methods of reducing costs. One method of reducing costs is to provide functional design, which will increase operating efficiency and reduce manpower, one of the biggest items in the hospital's operating budget. This has been one of the major aims of the architectural guide material developed and distributed by the Hill-Burton program since its inception. Another method might be the sharing of services, equipment, facilities, and manpower by several hospitals.

A major need in health facility construction is adequate funding for the required projects. In fiscal year 1968, the Hill-Burton program helped to fund 505 health facility projects at a total cost of

$728,855,217. The Hill-Burton share of the cost of these projects was $208,898,803. If the program could provide $1.6 billion to the States in 1969, they could proceed with 1,992 projects costing $4 billion. However, the Hill-Burton budget request for fiscal year 1969 is for only $267,200,000, which is only 16.7 per cent of the amount the states need from Hill-Burton. Construction materials and labor costs increase each year, and for each year that a health facility project is delayed, costs increase proportionately.

Certainly, there is a great need for innovations in design and construction of health facilities to prepare for future advances in technology and the new equipment that is constantly being developed. With rapidly changing medical concepts and procedures, the hospital constructed today may be partially obsolete in five years. Health facilities must be designed with built-in capability for expansion and change.

Prefab components and flexible utilities may offer long-term savings

The best and most advanced technology should be applied to the construction and operation of health facilities so vital to all segments of the population. The systems design approach to hospital construction encounters difficulties at present because of the great diversity of size and functions between hospital departments. However, cost savings may result from factory-assembled components such as toilet rooms, floor pantries, nurses' stations, clean and soiled workrooms, and even patient rooms.

Most systems for designing a flexible structure for long-term functional use cost more initially than conventional construction. However, construction costs should be measured in terms of the long-term usefulness of the building to the community. If the permanent elements of a hospital do not permit the expansion and changes necessary to maintain an efficiently functioning plant over the years, the structure will have to be abandoned and a new hospital built.

The Veterans Administration's new San Diego Hospital is one example of an attempt to build future flexibility into the hospital structure. The design includes utility service floors between each normal floor, with sufficient clear height to make necessary changes in any of the systems or to install such requirements as new equipment, utilities, and ductwork. In the sections of the hospital that do not require extensive utility equipment, these spaces can be used for administrative or other functions not closely related to clinical services.

The concept of arrangements between hospitals to share certain services and facilities may free some space in hospitals to allow for expansion.

Central services can lower costs

Because of the high cost of construction and the highly specialized and expensive equipment in use today, there is a trend toward sharing services and facilities such as laboratory services, radiosotope facilities, tissue banks, computer services, pharmacy services, dietary services, laundry services, equipment maintenance services, and even obstetrical facilities.

With present day equipment, a centrally-located automated laboratory could easily serve a number of hospitals, thus saving manpower and space.

Sharing of dietary services by several hospitals with meals prepared at a central location may prove advantageous. A number of hospitals are experimenting with the use of frozen and processed foods. The use of disposable dishes and other disposable equipment may be eliminated and a saving in manpower may be realized. The use of disposable dishes and other dietary equipment is growing. Although this saves reprocessing labor, the disposables require considerable storage space.

The low census and the shorter hospital stay of maternity patients have made it unnecessary and costly for all hospitals to have obstetrical facilities. These facilities are so expensive that unless a high census is maintained, the department operates at a loss. Through wide area planning, obstetrical facilities could be placed in a centrally located hospital where other hospitals could share in the services and facilities, thus eliminating the need for obstetrical facilities in each hospital.

Skimping on space per bed invites early obsolescence

Shared services can result in some space savings. However, as hospitals increase services and personnel, the number of square feet per bed will continue to increase. A few years ago, the allowance of 600 square feet per bed was considered normal. Today, a hospital of over 100 beds will need to provide 850 square feet per bed. A university teaching hospital serving a medical school will vary in size and area per bed depending upon the teaching program and the community obligations. For example, the community may demand that the facility provide more beds and outpatient services than are required for teaching purposes. Some teaching hospitals have required more than 1200 square feet per bed. Experience in the Hill-Burton program has shown that to skimp on space per bed is to invite early obsolescence. Last year 88 per cent of all Hill-Burton projects were remodeling jobs and additions, and the cost per square foot for these projects exceeded the cost of new construction.

Single rooms and air conditioning are not always luxury items

The use of single-bed rooms in hospital design, a well-established trend, is here to stay. From an economic standpoint

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<td>350</td>
<td>125</td>
<td>99</td>
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<td>82,395</td>
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<td>Sq ft per bed</td>
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<td>64</td>
<td>832</td>
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<td>Project cost:</td>
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<td>$4,832,360</td>
<td>$4,952,670</td>
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<td>Per sq ft</td>
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<td>56.45</td>
<td>60.11</td>
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<td>Per bed</td>
<td>79.67</td>
<td>38.65</td>
<td>50.029</td>
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<tr>
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<td>Per sq ft</td>
<td>51.70</td>
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<tr>
<td>Per bed</td>
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<td>Movable equipment</td>
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<td>15,000</td>
<td>167,234</td>
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only, disregarding the patient comfort aspects, the single-bed room has many advantages over the multi-bed room: 1) it provides a larger income to the hospital; 2) it makes possible more efficient use of other hospital departments; and 3) it enables the hospital to maintain a higher census—approximately 15 per cent higher than with the use of multi-bed rooms. An 80 per cent census for a multi-bed room hospital is considered high. However, a single-bed room hospital can easily operate at a 95 per cent or even higher occupancy rate. In other words, 15 per cent fewer beds can serve the same patient needs with the use of single-bed rooms. Greater efficiency in bed use expedites admissions for elective surgery, which also increases efficiency in use of other departments.

Air conditioning in the hospital has received universal acceptance and is recognized as contributing to the physiological and psychological well-being of the patient as well as to the comfort of both patients and staff. In addition, a well-designed system will not only reduce objectionable odor, but more importantly will reduce the spread of infectious airborne contamination. The Hill-Burton standards of construction and equipment detail some specific design criteria developed to assist in accomplishing these objectives.

The design of the ventilation system of such sensitive areas of the hospital as the surgical and obstetrical suites is most important because of the danger of infection from contamination in the air of the operating room. For this reason, current Hill-Burton regulations require 100 per cent outdoor air which is reported to be relatively free of pathogenic organisms for the ventilation of such areas, with no recirculation or re-use of the air. In this connection, a three-year study sponsored by the Hill-Burton program under contract with the Mayo Foundation on the recirculation of air in operating rooms has just been completed. This study is believed to be one of the most complete ever undertaken on this subject. Although the final report of the study has not been received, it is anticipated that there will be evidence that with the use of properly maintained high-efficiency filters available today, the contamination of the air of the operating room will be no greater with recirculation than with the use of 100 per cent outdoor air with no recirculation. If this proves to be true, it will usually result in lower equipment cost (through reduced heating and cooling loads) despite the additional ductwork, increased fan power and higher-efficiency filters required. Meticulous installation and maintenance will, of course, be required for a recirculation system.

No compromise with the safety of patients from fire and the combustion products of fire should be tolerated in the design of hospitals and health facilities. To achieve a facility which is as nearly as possible fire-safe, the flammability of all structural materials as well as finishes and furnishings must be controlled. The increasing use of carpeting in hospitals, which makes a valuable contribution to noise abatement, requires serious consideration from the standpoint of fire-safety and sanitation.

The Hill-Burton program requirements specify acceptable flame-spread limits for carpets to preclude the use of the more hazardous types.

Inaccurate cost estimates

**Impair values of the project**

Underestimation of the cost of projects has been a constant problem in the hospital construction field. There are several reasons for this underestimation, including the escalating cost of construction, lack of understanding of the actual space needs, and the time interval between planning and beginning construction. Also architects often overlook the fact that so-called "project costs" (which include equipment, site work, fees and other items listed under "other project costs" in Table 1) may be as much as 20 per cent greater than construction costs. As a result, when bids are received, alternatives are adopted which may reduce the scope of the project or impair the functions of the facility.

In a group of 55 new community hospitals recently studied, the average underestimation was about 10 per cent—a significant amount. In a few larger hospitals, this percentage was drastically exceeded.

The experience of the Hill-Burton program has been that reducing the square feet per bed of a project below an average figure of 850 square feet per bed does not proportionately reduce construction cost. Table 2, giving area breakdowns for two general hospitals, shows that the unit costs per square foot are higher in a hospital with a low square foot area per bed although the total cost is approximately the same. One major reason for this is that the mechanical, electrical, and plumbing costs are approximately the same for both projects, although the costs of fixed and movable equipment differ.

Although the escalation of costs cannot be accurately predicted, the following planning steps are suggested to partially alleviate underestimation of a project:

1. The client should provide the architect with a well-developed medical program. This program should be written by a hospital consultant and should accurately describe the scope of all functions to be performed within the facility.

2. The architect should develop an architectural program to fit the medical program. Space allocation for each of the medical functions should be sufficient to allow a cushion for possible necessary increase as the project develops.

3. Carefully prepared cost estimates should be developed and reviewed at each phase of development—schematic, preliminary, and final. In addition, an allowance should be provided for increased construction cost during the interval before the construction contract can be executed.

This brief review highlights only some of the important factors which hospital architects must consider today. The nation's architects have made a significant contribution to good hospital planning in the past two decades. This contribution has in turn had a part in the provision of better health care to more people. The future challenge will be more difficult because of changing concepts, advances in medical science, new technical equipment, and improvements in medical care. However, architects will be able to continue to make their contribution to the best possible medical and health care for all the people by providing innovations and improvements in design.

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**Table 2—AREA ALLOCATIONS FOR TWO NEW GENERAL HOSPITALS, 1964**

<table>
<thead>
<tr>
<th>Project</th>
<th>Hospital A</th>
<th>Hospital B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross area</td>
<td>112,983</td>
<td>234,425</td>
</tr>
<tr>
<td>Mechanical area</td>
<td>21,509</td>
<td>23,110</td>
</tr>
<tr>
<td>Circulation area</td>
<td>24,762</td>
<td>45,356</td>
</tr>
<tr>
<td>Exterior building area</td>
<td>2,955</td>
<td>1,658</td>
</tr>
<tr>
<td>Unfinished unassigned area</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Construction area</td>
<td>11,172</td>
<td>24,891</td>
</tr>
<tr>
<td>Net assignable area</td>
<td>52,565</td>
<td>119,410</td>
</tr>
<tr>
<td>Administrative</td>
<td>4,722</td>
<td>12,661</td>
</tr>
<tr>
<td>Obstetrics</td>
<td>1,951</td>
<td>3,679</td>
</tr>
<tr>
<td>General sterile supply</td>
<td>1,328</td>
<td>5,474</td>
</tr>
<tr>
<td>Dietary</td>
<td>4,404</td>
<td>13,739</td>
</tr>
<tr>
<td>Emergency</td>
<td>921</td>
<td>0</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>324</td>
<td>846</td>
</tr>
<tr>
<td>General storage</td>
<td>2,321</td>
<td>6,265</td>
</tr>
<tr>
<td>Housekeeping</td>
<td>797</td>
<td>2,499</td>
</tr>
<tr>
<td>Intensive care</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Nursery</td>
<td>1,745</td>
<td>1,820</td>
</tr>
<tr>
<td>Locker rooms</td>
<td>1,469</td>
<td>2,945</td>
</tr>
<tr>
<td>Nursing</td>
<td>26,614</td>
<td>46,004</td>
</tr>
<tr>
<td>Outpatient</td>
<td>718</td>
<td>1,877</td>
</tr>
<tr>
<td>Pathology</td>
<td>1,843</td>
<td>5,490</td>
</tr>
<tr>
<td>Maintenance spaces</td>
<td>160</td>
<td>630</td>
</tr>
<tr>
<td>Radiology</td>
<td>2,389</td>
<td>3,916</td>
</tr>
<tr>
<td>Surgical</td>
<td>2,079</td>
<td>8,960</td>
</tr>
<tr>
<td>Therapy</td>
<td>0</td>
<td>3,505</td>
</tr>
<tr>
<td>Number of beds</td>
<td>207</td>
<td>630</td>
</tr>
<tr>
<td>Construction cost per sq ft</td>
<td>$41.65</td>
<td>$24.15</td>
</tr>
<tr>
<td>Project cost per sq ft</td>
<td>$50.30</td>
<td>$27.10</td>
</tr>
<tr>
<td>Sq ft per bed</td>
<td>546</td>
<td>991</td>
</tr>
</tbody>
</table>
Visual contact from nursing station to all patient rooms is the primary theoretical advantage of the round nursing unit. Short walking distances are another. Accessibility of supporting supply spaces needs careful planning to cut distances and costs.

Round-unit towers aid expansion on a tight site

Efficiency of the round nursing unit has been debated for decades, but is now fairly well established as a useful form when the radius is held within limits that permit the central nursing station to be of adequate but not excessive size. When the administration of St. Joseph Hospital decided to add 150 more beds to the existing hospital in downtown Denver, the solution of raising two round nursing towers permitted expansion without suspending services for the already-existing 330 beds. In two years of operation, the form has proved itself more than adequate, especially for pediatric and intensive care services. Sister Mary Andrew, administrator, reports that the eight circular floors “definitely are functional. . . . Members of the medical staff praise them for the elimination of long corridors.”

Variety of medical and surgical nursing layouts with generous spaces at control points provide a good basis for comparison at Rochester. A full-height mechanical floor over the surgical suites also permits testing and changing various air distribution systems. Two of the operating rooms have systems that can provide up to 100 air changes per hour while maintaining positive pressure to control airborne infection.

Flexible plan provides both round and square floors

Another variation of the round form was designed by Ellerbe Architects for the Rochester Methodist Hospital, an independent adjunct to the Mayo Clinic complex. This combination of circular and rectangular nursing units was frankly an experiment by the Mayo Clinic to determine the relative merits of these forms. A previous study had already established the benefits of the round form for intensive patient care. Reports of personnel using both forms at Rochester underscore the merits of each. The isolation of the clover leaf towers provides a low noise level, while the single- and double-corridor layouts of the rectangular units have advantages in storage and conference spaces.

Another experiment at Rochester was installation of six different air handling systems in operating suites using various outlets including perforated ceilings, and recirculating 25 to 100 per cent of return air. Results are pending.

The radial square, a variation on the round

A thoughtful compromise offering the advantages of radial layout with some of those of the rectangular is the arrangement of four square towers around central utility and traffic spaces at Lincoln General Hospital. Architects Davis and Wilson have provided a base for central services and surgery with ready access to the nursing floors via central elevators. The lobby and utility spaces on each floor are contained in a double-corridor rectangle, with short corridors giving access to nursing units which emerge as towers at the corners of the rectangle. This layout provides good traffic separation so that, for example, psychiatric and surgical units can be on the same floor. While in the radial square the distance from the nurses station to the farthest bed is a compact 30 feet, the limitations of the radius are possibly compounded by the presence of corners. The nursing unit appears to be fixed at 22 beds.

LINCOLN GENERAL HOSPITAL, Lincoln, Nebraska. Architects: Davis and Wilson, Inc.; contractor: Olson Construction Company.
The double-corridor floor grows radial ends

Another squared adaptation of the circular nursing wing was developed by Neuhaus and Taylor for the Angleton-Danbury Hospital in Brazoria County, Texas. Patient room partitions are arranged radially around a central square nursing station providing visual control and short walking distances for nursing routines. Further, the layout is said to permit operation with a minimum of professional staff, an advantage in these times when nursing personnel are in short supply. The two radial units are linked by a double-corridor rectangular unit in which private and semi-private rooms for minimal care patients are located. The initial 64-bed capacity can be doubled by addition of a third floor which foundations are designed to carry. Each of the two radial nursing units controls 24 patient rooms, with glass corridor walls for full visibility.

ANGLETON-DANBURY DISTRICT HOSPITAL, Brazoria County, Texas. Architects: Neuhaus & Taylor; structural engineers: Ellisor Engineers; mechanical and electrical engineers: Bovay Engineers, Inc.; contractors: Spaw-Glass, Inc.
This plan turns the circle inside out

The inside-out circle was the solution Ellerbe Architects devised for promoting flexibility and expansibility at Fairview Southdale Hospital in Edina, Minnesota. This adaptation of the radial nursing unit was to provide optimum conditions for acute nursing care as well as increased privacy. While visibility from the nursing station to the private rooms at the ends of the short radial corridors is less than complete, the central triangular nurses’ station does overlook several rooms in which acutely ill patients can be kept under constant supervision. The hospital was designed for orderly expansion from 225 initial beds to an ultimate 700-bed capacity by addition of three future floors and another wing. About 15 per cent of the beds are in single rooms. Full year-round air conditioning is provided, with each room individually zoned. Each room also has piped oxygen and vacuum.

FAIRVIEW-SOUTHDALE HOSPITAL, Edina, Minnesota. Architects and engineers: Ellerbe Architects.
With models and a full-scale mock-up, the architects studied modes of providing extended care patients some of the aspects of the single room and the sitting room while retaining the cost and care advantages of the double room. This copyrighted configuration is the result. Triangular toilet and utility spaces between rooms isolate flushing noises to the outside and give ready access to mechanical spaces. Central bathing facilities on the floor are said to stimulate locomotion.

New room shape offers amenities for extended care

Inventive approaches to room layout seek to retain the insurance advantage of the double room while offering the privacy and visual amenities of the single room. This is an increasingly important consideration for long-term care and ambulatory patients. The extended care room designed by Potter Lawson Findlay & Pawlowsky for the Community Memorial Hospital in Edgerton, Wisconsin gives each patient a view out the window and the privacy afforded by a dividing curtain. By placing the patient’s head next to the corridor wall, a 12-foot separation between beds is possible, and a seating area next to the window gives ambulatory patients and visitors a home-like space for communication. Carpeted corridors reduce noise, and indented configuration of corridor walls adds visual interest.

Replacement master plan exploits a sloping site

Detail and vocabulary befitting its steep, wooded, New England site distinguish Markus & Nocka's solution to Emerson Hospital's program of planned growth. Staged replacement of older portions of the hospital took advantage of the sloping site in providing grade-level access to three floors and exceptional views from rooms and waiting areas. The growth phase, now completed in accordance with the architect's master plan, enlarges existing service facilities and adds about 34 beds and an empty floor shell for an additional 34 beds. New X-ray, emergency, outpatient and physical therapy departments are also provided. A simple vertical and horizontal circulation system puts all departments in close proximity to existing pathology and laboratory departments. Extension of the elevator shaft and adjacent stairway two floors beyond height of present structure will simplify second growth phase.

Location of day rooms and roof terraces was largely dictated by the site—18 wooded acres of sloping land adjacent to a bend in the Concord River. The steep slope also will permit unobtrusive construction of a multi-story garage planned to meet the parking requirements for an ultimate capacity of 400 beds.

Spaciousness in waiting areas, patient rooms and nursing centers is enhanced at Emerson by fenestration and planned traffic control making use of three access levels for separation of receiving, visiting and staff traffic.

Flat-slab reinforced concrete structure is designed with 22 foot square bays with concrete shearwalls. Columns and footings are designed to carry an additional six floors.
Hospital’s 30-year plan adapts to changing times

Master planning for replacement of an urban hospital on its own site and for doubling its capacity over a 30-year growth program demands a great deal of demographic projection that may soon be outdated in this accelerated age. The plan, then, must adapt itself to speeding up and to re-evaluation as circumstances warrant. That was the case at this Connecticut community hospital which decided to replace old buildings and double its capacity without interrupting service. It turned out that phase one, shown here, is really about three steps in the original plan. It is a new six-floor wing (instead of the three floors originally planned for phase one) attached by covered walkway to a new utility and receiving building. The top floor is a completed shell.

The warmth of water-stripped red brick panels framed in sand-blasted concrete sets a contemporary but compatible vocabulary for this phased replacement of an old New England hospital. The lowest level of utility spaces connects on grade with an engineering and receiving building that replaces an old garage. The graded site then gives second-level access to dining, laboratory and supply spaces. The third level is a more-or-less conventional double-corridor nursing floor, but with exceptional visual contact between nursing station (above) and acute-care rooms. Fourth level is recessed, and contains pediatric services which will have a surrounding balcony and play area. Extended care and ambulatory patients are on the fifth level with access to a two-story skylighted court and sitting area (left). The top level is now a shell space constructed to take advantage of current cost against a rising spiral of inflation.
Relocation for planned growth  
gives Santa Cruz a fresh start

Master plan for this Dominican Hospital in Santa Cruz calls for relocation of two existing hospitals on a new site and ultimate expansion from 150 beds to 300 beds. The new site, 17 acres, permits low-rise construction with courts and landscaping in character with the sisters' insistence on family-like care. The sisters live in an adjacent building attached to the chapel. In this convent also, home-like atmosphere is enhanced by landscaped courts as in the photo at top, opposite.

The hospital itself is planned for two-story operation, with dining and kitchen facilities on the second floor freeing first-floor space for diagnostic and maternity facilities, and also permitting horizontal service of food to 100 patients on the second floor.

Square plan of the Santa Cruz hospital permits generous use of space in an interior courtyard and a two-story main lobby. The nursery is located along one glass wall of the first-floor court so that siblings, not permitted to enter the maternity floor, can view babies from the court. Square plan also improves flexibility of nursing units in that more or fewer rooms can be assigned to a given station as loading requires. Whole-hospital services include a psychiatric unit on the second floor.

Complete flexibility and ease of maintenance are enhanced by a seven-foot truss space between floors that carries all mechanical and electrical services.
Rex Allen's noted “duo-room” introduced at the Woodland Memorial Hospital (RECORD, June 1968, page 143), is brought to another phase of configuration in the offset fenestration, permitting each patient to have a view out his own window and elective privacy by means of a folding partition (right).

The two-story lobby permits visitor access by stairway to the second floor, saving the expense of one elevator for that purpose and creating an impressive entrance space (above). Secondary business and waiting lobbies are located on each floor. The one shown below is on the second floor.
A steel space frame that works with finesse

To shelter Princeton University's extensive new indoor athletic facilities, designers rejected the easy, but brute-force, arch-and-beam approach, and shunned a prohibitively expensive, though elegant, stiffened steel skin. Instead they evolved a fitting intermediate solution of ribs and diagonals, elaborated with particular skill and imagination.

The low, giant steel cage now going up on the Princeton University campus, with its three-part structure spanning nearly 400 ft of clear space, solves the increasingly common problem of housing huge assembly crowds, and at the same time responds to the special space requirements of a large athletic complex.

The plan of the gym's first floor was organized in three parts: first, an elliptical track area, then a rectangular space for practice and exhibition basketball courts, and, at the opposite end, a permanent grandstand balcony seating 3500. Though the level below could have some columnar support, this level had to be clear span. The grandstand balcony would have to get clear sight lines, and the entire floor area would on occasion have to provide clear-span space for school-wide assemblies of up to 10,000 persons. Architects Walker O. Cain & Associates decided on a half dome as the natural shape to roof the elliptical track area, while a truncated cone seemed best to suit the rectangular space.

To achieve both shapes and required column-free space, the architects and their engineers, Severud-Perrone-Sturm-Conlin-Bandel, have evolved a space frame, whose success depends on reasoned elaboration rather than on daring invention, and that can be achieved within today's construction discipline.
Intersection of the dome with an edge truss

Huge center column supports 6-ft deep girders for main floor slab.

Top flange of the arch can be considered to take the axial loads, and bottom flange to resist buckling. Rolled section of the diagonal resists bending moment from the roof load, and the plate welded to its bottom flange takes axial forces. Its thickness varies from $\frac{3}{8}$ in. to $\frac{3}{4}$ in. to match variations in forces.
The steel framework of the great, low barrel in the photos above is composed of three intermediate arches 30-in. deep, interacting with built-up diagonal members, 16-in. deep. This section frames into the bottom chord of the trussed arch at left that also stiffens the half-dome structure. Radial arches of the dome taper from a 30-in. depth at the base to 18 in. at the top. The roof over the stands (photo right) is made up of bar joists which achieve a warped geometry as they frame into the barrel's other edge stiffener. This roofed upper floor is columnless, and the floor beneath, also housing athletic facilities, has only the single center column shown at left, plus five small flanking columns, to support the floor. The roof structure is covered by cement-wood fiber planks and a neoprene-Hypan roofing system. Inside, the lattice grid will be left exposed. Rather than varying the width of the bottom flanges to correspond to bearing axial stresses, plates of varying thicknesses were welded to the rolled sections.

Connection details of diagonals to gusset plates (above) and bottom gusset plate to edge truss (left). Trusses and arches were of all-welded construction. Diagonals were welded to top gusset plate, bolted to bottom. All welds were checked by ultrasonic device.
The complex structural computations were obtained by computer analysis. A computer-controlled pen produced the drawing below for the steel subcontractor, American Bridge Company.

Structural form was suggested by the floor plan. The section's low profile was a program requirement that strongly influenced the solution.

Structures for the half dome and barrel (photo above and computer drawing to the left) are basically space trusses, independently working, but merged into huge steel arches that provide edge stiffening for each. These trussed arches, spanning the 340-ft width of the building and rising 75 ft, provided clerestories for natural lighting and exhaust outlets for mechanical equipment.

Despite the complex analysis that lies behind the structural solution, engineers describe their space grid by a simple analogy: ribs and diagonal members act like the reeds of a wicker basket, whose curvature and interlacing work to carry loads axially and to knit the surface together into a rigid system. Huge forces developed by arch action resolve into the edge members by a network of diagonals that disperse loads across the surface. The diamond patterns formed by interlocking diagonals are triangulated by Junior Beams—smaller steel members—to resist buckling of the surface plane. Thus the structural elements, by creating paths for forces throughout the building's surface, eliminate entirely the need for interior supports.

Behind the elegant and deceptively simple lines of the final solution is a complex interaction of structural phenomena. To best appreciate the solution, visually expressed as it is in both shape and structure of the new building, it is important to be conscious of this structural behavior, and this is explained on the pages that follow.
Structural behavior of the conical barrel

The basic structural elements comprise: 1) edge trusses in the form of arches; 2) intermediate arches; 3) diagonals between these members. If the cross-section had been a parabola, the vertical loads would have produced pure compression in the arches. Under dead load, each arch would have acted in its own plane. Shell action would be initiated by wind and snow loads. Shell action also would stiffen the intermediate arches against buckling.

Since an ellipse is flatter at the top than a parabola, there are high compressive forces in this region where arch action is predominant. The intermediate arches tend to bulge out near the supports because the curvature is greater there, and the dead load is not sufficient to "bend" the compression down. For this reason, the intermediate arches cannot stand alone, but are "helped" by the edge trusses as explained below.

The high compression in the center of the intermediate arches is gradually reduced from the center line down by a system of tension and compression diagonals. This action is seen at point A. At point B, additional load is introduced into the diagonals because forces are being channeled from both an outside and the center arch. At point C, the resultant of the tension and compression in the diagonals is introduced into the edge truss as a shear force in the plane of the truss.

Although most of the compression in the intermediate arches is channeled into the edge trusses when the roof starts to bend down, there still is enough compression to tend to push the arch out and up in an amount that exceeds the loads. Tension in the diagonals shown resist this tendency.

There is almost no force in the intermediate arches where they meet the ground. Reason is that the loads are transferred to the edge trusses, as shown above. The roof, then, acts as a beam between the arches, requiring compression at the top and tension at the bottom. Imagine the center of the barrel as the compression flange, the lower portion as the tension flange, and space in between as the web.

The sum of all these effects is reflected in the solution illustrated below, determined by a computer. Magnitude of forces is indicated by weight of line. Small forces are indicated by dashed lines.
Structural behavior of the half-dome

The basic structural elements comprise: 1) an edge truss in the form of an arch; 2) intermediate arches; 3) diagonals between these members.

If the shell had been a complete dome, the stresses would be as shown in this drawing. On the left-hand side are shown stresses for a continuous shell. Since the dome does not have rings, the forces must be resolved into corresponding diagonals, shown on the right-hand side.

Since the shell is only a half-dome, the forces that exist along the edge truss do not have an opposite structure to act on, so they must be absorbed by the shell itself.

Part of the forces is resisted by "beam" action along the edge and in the plane of the shell, causing a reaction in the diagonals as shown.

The remaining forces are taken by ties back into the shell. Since these ties are curved, their tensile forces try to flatten out the shell, causing compression forces in the diagonals. The tension in the ties fades away when they penetrate back into the shell.

The sum of all these effects is reflected in the solution illustrated below determined by a computer. Magnitude of force is indicated by weight of line. Small forces are indicated by dashed lines.
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MODULAR FURNITURE SYSTEM / Jorn Utzon, architect of the new Opera House in Sydney, Australia has designed a modular-type furniture system for entrance halls, hotel lobbies, waiting rooms, lounges, offices, and even houses. Aluminum U-shaped structural frames in nine different sizes are important in creating a variety of chairs, sofas, tables and showcases. Foam rubber cushions are upholstered in either oxhide or fabric, and table tops are Mipolam.

The system can be altered, modified, and added to, and assembly is not complicated. For example, only five elements are required for a low table. Two side frames and a cushion can be added to make an ottoman, or higher frames and four cushions create a lounge chair. The side of a chair can be a common frame with an end table. Fritz Hansen, Inc., New York City.

RUGGED CARPET TEST / Approximately 24,000 Heugafelt carpet squares were installed in the Miami Beach Convention Hall for the recent Republican National Convention. This was a rugged test for the loose-laid squares that withstand heavy traffic and resist burns and stains. Heugafelt wall-to-wall carpet can be changed from room to room or can be re-arranged within a room to eliminate traffic paths. In the case of the convention, tiles were simply picked up and stored for other uses. Van Heugten U.S.A. Inc., Kenilworth, N.J.
PLAY CANALS / Martian Canals are colorful fiberglass troughs scaled to let young children play with sand (or water) without getting into it. This may be the answer to some old problems: toilet use by animals is eliminated; children do not sit in the sand, thus getting it into their clothes and carrying it into buildings; and the units require small amounts of sand that can be easily cleaned and replenished. Individual units include a quarter-round blue unit, a half-round yellow unit and a rectangular red unit.

Playground Corporation of America, Long Island City, N.Y.

Circle 302 on inquiry card

TRANSFORMER DISGUISE / There are five different disguises for pad-mounted transformers for underground residential electrical service. Shown here is "rock," a precast concrete or fiberglass enclosure made in two sections; frog on top provides ventilation. Other disguises are "redwood," "mushroom," "primitive" and "breadbox." Standard Transformer Co., Warren, Ohio.

Circle 303 on inquiry card

BEAM SYSTEM / This relocatable support beam system for operable walls and folding partitions is said to allow flexibility in either existing buildings or new construction. The Spanmaster support beam is anchored to a load-bearing floor; according to the manufacturer, the beam fits snug to the ceiling for positive sound control, and tie rods through existing ceiling are used to eliminate lateral movement. New Castle Products, Inc., New Castle, Ind.

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HOSPITAL AUTOMATION / AMSCAR is a self-propelled distribution vehicle that uses electronic and mechanical components to distribute patient-care equipment, surgical supplies, linens, and food. The unit, which handles almost a half-ton of supplies, can go anywhere in a hospital, even up and down elevators. It returns soiled items to a central processing area, where more automated equipment collects, sorts, washes, packages, sterilizes and stores the equipment. AMSCAR then propels itself through an automatic wash to prepare for the next round. The entire series is accomplished as the unit follows a series of tiny guidewires imbedded in the hospital floor.

* Amso Systems Company, Erie, Pa. Circle 305 on inquiry card

FREE-FLOATING LUMINOUS CEILING / A luminous ceiling louver-diffuser system is self-supporting and interlocking to provide even light diffusion without light leaks over any area. It can be installed free floating without wall termination and is constructed of 2-ft by 2-ft injection molded panels with a patented overlapping feature. Panels are flat on the top side, while tangent 1-in. circular louver cells give low surface brightness height. The ceiling is guaranteed against discoloration for 20 years.

* United Lighting & Ceiling Corporations, Oakland, Calif. Circle 306 on inquiry card

more products on page 234

Licensees Fabricators

UNITED STATES

alabama

Baton Rouge

Kingfisher Homes Corporation

(318) 945-3500

Greenville

Construction Components Co. Inc.

(205) 302-3300

Tuscaloosa

Friday Lumber Company, Inc.

(205) 808-2324

alaska

Anchorage

Alaska Lumber & Mill. Co., Inc.

(907) 277-3212

arizona

Glendale

O'Malley's Building Materials

(602) 939-1483

california

Los Angeles

Gang-Nail of Arcada

(714) 827-1343

Oakland

Oakland Lumber Company

(510) 805-2441

Campbell

O'Reilly & Stilts Incorporated

(408) 371-6171

Cerritos

Gang-Nail Components

(714) 921-9411

Gardena

American Building Components Co.

(310) 829-0400

Modesto

McWilliams Lumber Company

(209) 534-6061

National City

Western Lumber Co.

(714) 202-3641

North Highlands

Truss-Com

(916) 232-4720

Vista

Gang-Nail Truss of Vista

(703) 732-2222
colorado

Denver

Frank Pautten Lumber Company

(303) 398-6610
delaware

Bear

Roal Texas Inc.

(302) 834-4209

florida

Holly Hill

Pebble Building Components Inc.

(352) 234-4686

Orlando

Trus-Masters of Florida, Inc.

(352) 234-8231

Pensacola

James M. Keizer Builder Inc.

(503) 470-1281

Pensacola Beach

Truss Florida Roof Truss, Inc.

(850) 963-6189

Sarasota

Electrotruss & Sunblades Lumber Co.

(813) 855-2627

Tallahassee

Tallahassees Building Supply Inc.

(904) 224-1225
gorgia

Albany

Smith Lumber Company

(970) 235-3033

Atlanta

Kingston Homes Corporation

(404) 451-4201

Augusta

Augusta Stud & Door Company

(404) 715-1445

Cumming

Residential Developers Inc.

(404) 474-4369

Perry

Tullahoma Lumber & Supply Co. Inc.

(931) 877-2334

hawaii

Honolulu

Fabricators Inc.

(808) 839-311

illinois

Champaign

Moore Farm Building Company

(773) 456-6355

Chicago

Edward Hines Lumber Co.

(312) 924-6060

E. St. Louis

Young Roof Trusses, Inc.

(618) 896-2424

Moline

Two State Component Company

(309) 767-1274

Pittsfield

Kasota Construction Company

(717) 285-2194

Indiana

Indianapolis

Rogers Building Supplies Inc.

(317) 327-8361

Indianapolis

Texas-Manufacturing Co.

(317) 386-2751

New Albany

U.S. Steel Homes Division

(812) 944-7711

iowa

Burlington

Hamory Construction

(319) 764-8524

dese Moines

H. M. Ilits Lumber Company

(515) 255-1156

dese Moines

Frank Pautten Lumber Company

(515) 255-2131

dese Moines

Bloom Supply Company

(515) 677-8330

Eigiamont

Kingfisher Homes Corporation

(515) 622-2384

kansas

Kansas City

K. L. Sweet Lumber Company

(913) 236-6800

Topeka

Wichita's Inc.

(785) 367-0321

kentucky

Hopkinsville

Pal Lumber & Manufacturing Co., Inc.

(602) 866-3331

Lexington

Citizens Lumber & Supply Co., Inc.

(606) 265-6380

Lexington

Home Supply Company, Inc.

(606) 258-3801

Parkville

Hop-Green Lumber Corporation

(606) 442-4361

louisiana

Shreveport

Gang-Nail Truss Co. of Shreveport, Inc.

(903) 888-6000

massachusetts

Boston

Gentry Company, Inc.

(617) 582-2010

Braintree

L. Greenwood Sons Inc.

(617) 604-0900

Braintree

New England Builders Supply Inc.

(617) 943-6050

Readville

Gentry Company, Inc.

(617) 402-3364

michigan

Detroit

General Wood Products Co.

(313) 834-5290

Kalamazoo

Roof Truss Manufacturing Co.

(616) 242-2417

Lansing

Heart Truss & Engineering Inc.

(517) 372-0850

minnesota

Mountain Lake

Klasse Lumber Company

(507) 427-2656

missouri

Kansas City

Frank Pautten Lumber Company

(816) 480-7000

Kirksville

Wood Tech Corp.

(314) 514-1132

montana

Whitehall

Structural Components, Inc.

(406) 287-3222

nebraska

Hastings

W. C. Paulson Lumber Company

(402) 482-4105

Lincoln

Wood-SPAN Division

(402) 482-1207

nevada

Sparks

Wood Fabricators Inc.

(702) 359-8765

new jersey

Fremont

Mid-Western Mills Inc.

(201) 462-9200

albuquerque

Frank Pautten Lumber Company

(505) 343-7891

new york

Albany

Gentry Company, Inc.

(518) 450-3310

Hartlett

Matthews & Field Lumber Co., Inc.

(716) 234-5000

Middlebury

The Barnum & Robinson Company

(802) 725-3200

Syracuse

Gentry Company, Inc.

(315) 453-5206

Gang-Nail Trusses Span The Globe

For more data, circle 92 on inquiry card

Paragon Swimming Pool Co., Inc.

Pleasantville, N.Y. 10570

Mfrs. of Quality Pool Products

Please send me a copy of Sweet's Arch. Catalog File 36c/PAR.

NAME

ADDRESS

CITY......STATE......ZIP......

continued from page 196

For more data, circle 92 on inquiry card

For more data, circle 92 on inquiry card

For more data, circle 92 on inquiry card
## Licensed Fabricators

### UNITED STATES

<table>
<thead>
<tr>
<th>State</th>
<th>City</th>
<th>Company Name</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Carolina</td>
<td>Kernersville Tri-City Building Components Inc.</td>
<td>(919) 993-4541</td>
<td></td>
</tr>
<tr>
<td>North Dakota</td>
<td>Fargo</td>
<td>Crane-Johnson Company Inc.</td>
<td>(701) 236-8272</td>
</tr>
<tr>
<td>Ohio</td>
<td>Canton</td>
<td>Crystal Park Lumber Company</td>
<td>(314) 452-0167</td>
</tr>
<tr>
<td></td>
<td>Cincinnati</td>
<td>Hyde Park Lumber Company</td>
<td>(513) 321-0797</td>
</tr>
<tr>
<td></td>
<td>Columbus</td>
<td>Lincon Lumber &amp; Millwork Co.</td>
<td>(614) 347-0000</td>
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<td></td>
<td>Dayton</td>
<td>Concrete Inc.</td>
<td>(513) 885-7823</td>
</tr>
<tr>
<td></td>
<td>Easton</td>
<td>Leatherman Lumber Company</td>
<td>(513) 492-4115</td>
</tr>
<tr>
<td></td>
<td>Elyria</td>
<td>West Side Lumber &amp; Concrete Corp.</td>
<td>(315) 321-4641</td>
</tr>
<tr>
<td></td>
<td>Mansfield</td>
<td>Pennco Woodwork Company</td>
<td>(513) 895-0961</td>
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<td></td>
<td>Mansfield</td>
<td>Wickers Corporation</td>
<td>(419) 522-7775</td>
</tr>
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<td></td>
<td>Newark</td>
<td>W &amp; G Lumber &amp; Builders Supply</td>
<td>(611) 344-2177</td>
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<tr>
<td></td>
<td>Norwood</td>
<td>Remington Sixth &amp; Door Mfg. Co.</td>
<td>(513) 531-5788</td>
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<tr>
<td></td>
<td>Ravenna</td>
<td>Smoogin Builders Supply Co., Inc.</td>
<td>(726) 206-3828</td>
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<td></td>
<td>Springfield</td>
<td>Smoogin Builders Supply Co., Inc.</td>
<td>(816) 323-5803</td>
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<td></td>
<td>St. Bernard</td>
<td>The Skoog-Volm Lumber Company</td>
<td>(513) 242-1840</td>
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<tr>
<td>Oregon</td>
<td>Corvallis</td>
<td>W. J. Conrad Lumber Company Inc.</td>
<td>(503) 267-3181</td>
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<td></td>
<td>Medford</td>
<td>Big Fish Lumber Company</td>
<td>(503) 723-5333</td>
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<td>Tigard</td>
<td>Air-King Manufacturing Corp.</td>
<td>(503) 639-1161</td>
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<tr>
<td>Pennsylvania</td>
<td>Chambersburg</td>
<td>Green Lumber &amp; Millwork Co., Inc.</td>
<td>(717) 564-6141</td>
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<td>Wilkes Barre</td>
<td>Hiles Homes Corp.</td>
<td>(717) 523-4064</td>
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<td>York</td>
<td>York-P Components Inc.</td>
<td>(717) 494-5651</td>
</tr>
<tr>
<td>South Carolina</td>
<td>Columbia</td>
<td>Columbia Truss &amp; Components Co.</td>
<td>(803) 294-7725</td>
</tr>
<tr>
<td>Tennessee</td>
<td>Kennesaw</td>
<td>Timbers Incorporated</td>
<td>(615) 548-0533</td>
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<td></td>
<td>Murfreesboro</td>
<td>Superior Truss Company</td>
<td>(615) 893-6055</td>
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<tr>
<td>Texas</td>
<td>Austin</td>
<td>Building Components Mfg., Inc.</td>
<td>(512) 375-0447</td>
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<td>Corpus Christi</td>
<td>Building Components Mfg., Inc.</td>
<td>(512) 337-5998</td>
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<td>Dallas</td>
<td>Barnes Lumber &amp; Manufacturing Co.</td>
<td>(512) 358-5311</td>
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<td>El Paso</td>
<td>Construction Components, Inc.</td>
<td>(512) 718-5221</td>
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<td>Utah</td>
<td>Salt Lake City</td>
<td>Consolidated Building Supply Co.</td>
<td>(801) 355-4601</td>
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<td>Virginia</td>
<td>Bayonne</td>
<td>Blue Ridge Pin &amp; Truss Company</td>
<td>(703) 477-3920</td>
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<td>Charlottesville</td>
<td>Imperial Components Inc.</td>
<td>(703) 879-5231</td>
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<td>Emporia</td>
<td>Kingsbury Homes Corporation</td>
<td>(703) 364-2724</td>
</tr>
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<td>Petersburg</td>
<td>Builders Supply Co. of Petersburg Inc.</td>
<td>(703) 732-7822</td>
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<td>Roanoke</td>
<td>Timber Truss Company</td>
<td>(703) 349-7725</td>
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<tr>
<td>Washington</td>
<td>Issaquah</td>
<td>St. Regis Forest Products</td>
<td>(206) 352-5367</td>
</tr>
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<td></td>
<td>Tacomco</td>
<td>Bridge Manufacturing Co.</td>
<td>(206) 472-4409</td>
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<td>Tacoma</td>
<td>St. Regis Forest Products</td>
<td>(206) 350-1801</td>
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<td>Vancouver</td>
<td>Mercer Manufacturing Co.</td>
<td>(206) 690-3755</td>
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<td>Walla Walla</td>
<td>Van Peterson Lumber Co.</td>
<td>(206) 625-4000</td>
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<tr>
<td>Wisconsin</td>
<td>East Claire</td>
<td>Marlor's Cashway Lumber Yard</td>
<td>(715) 674-5585</td>
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<td></td>
<td>Merrill</td>
<td>Wisconsin Windshield Div.</td>
<td>(715) 536-5501</td>
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<td></td>
<td>Middlesex</td>
<td>Dane County Texas Company</td>
<td>(715) 536-1961</td>
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<td>Milwaukee</td>
<td>Wisconsin Bridge &amp; Iron Company</td>
<td>(414) 466-2100</td>
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<td>Racine</td>
<td>The Custom Component Co.</td>
<td>(414) 403-2273</td>
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<td></td>
<td>Sheboygan Falls</td>
<td>Nicnic Structures</td>
<td>(414) 647-4646</td>
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<td>Sallus Springs</td>
<td>Precision Wood Truss Co.</td>
<td>(715) 276-2270</td>
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<tr>
<td>Wyoming</td>
<td>Cheyenne</td>
<td>Builders Fabrication &amp; Supply Co.</td>
<td>(307) 341-1904</td>
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### CANADA

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<tr>
<th>Province</th>
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<tr>
<td>Alberta</td>
<td>Mat's Lbr. &amp; Bldg. Supplies Ltd.</td>
<td>Nelson Lumber Company Ltd.</td>
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<td>British Columbia</td>
<td>Nat'l Engineered Structures Co.</td>
<td>Nelson Lumber Company Ltd.</td>
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<td>Newfoundland</td>
<td>Walken Enterprises Ltd.</td>
<td>Nelson Lumber Company Ltd.</td>
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<td>Ontario</td>
<td>Forthill Lumber Ltd.</td>
<td>Glen Supply Company Ltd.</td>
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<td>London Roof Truss Ltd.</td>
<td>Glen Supply Company Ltd.</td>
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<td>Millford Construction Ltd.</td>
<td>Glen Supply Company Ltd.</td>
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<td>Steeplechaser Lumber Ltd.</td>
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<td>Kramer Const. &amp; Lumber Ltd.</td>
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<td>Stiltite Lumber &amp; Supply Ltd.</td>
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<td>G &amp; M Forest Products Ltd.</td>
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<td>Alcan Universal Homes</td>
<td>NASCO Lumber Company Ltd.</td>
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<td>Quebec</td>
<td>Reif Truss Incorporated</td>
<td>NASCO Lumber Company Ltd.</td>
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<td>Materia, Inc.</td>
<td>Steel &amp; Timber Structures Ltd.</td>
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<td></td>
<td>D. I. S. Products Limited</td>
<td>Steel &amp; Timber Structures Ltd.</td>
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</tbody>
</table>

See us in Sweets. © Automated Building Components, Inc. 1968

### Let a GANG-NAIL® truss fabricator make your design job easier

128-foot special Gang-Nail gable trusses erected in one piece for Imperial Components Inc., Charlottesville, Va.; truss plant. Trusses 8 ft. OC for 40 psf.—Stainback & Scribner, AIA.

Because of rising construction costs, more and more designers and builders find that structural problems can be solved by Gang-Nail Truss Systems. Each of the licensed fabricators listed has a design library of over 14,000 computer-designed wood trusses available, offering a wide range of flexibility. In addition, special design service for complex structures to meet all requirements is supplied by qualified structural engineers to all Gang-Nail Fabricators.

Gang-Nail® is the exclusive manufacturer of a 14 gauge quality steel connector permitting heavier loads and longer spans. All components are produced with precision on heavy-duty automated equipment under quality controls ensuring the highest degree of uniformity.

Call one of the Gang-Nail "Problem Solvers" listed at left... You'll like the economical solution, the estimate and the dependability of on-time delivery.

### AUTOMATED BUILDING COMPONENTS, INC.

7525 NW 37th Avenue • Drawer J • Miami • Florida 33147
PLANTS IN: LOS ANGELES • CANADA • UNITED KINGDOM • AUSTRALIA • NEW ZEALAND • SOUTH AFRICA

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For more data, circle 93 on inquiry card
Things that go bump in the night
You know the feeling. Somebody's following you. Your palms get wet. The back of your neck gets cold. You're scared.

You tell yourself it's just your imagination. Monsters don't exist. And they haven't since you were five.

But then lurid newspaper stories flash through your mind. Maybe monsters don't exist, but robbers and muggers do. And all it takes is one bump.

If only it weren't so dark.

Sylvania knows a little light goes a long way. Especially when the bumps are in someone's imagination. So we make night-lights for grown-ups. Our outdoor lighting fixtures are the most dependable ones you can buy.

And they can solve just about any lighting problem. We have the right fixtures for everything from racetracks to church steeples. Or from patios to parking lots. (Take the GBB shown above. It illuminates an average of 5 footcandles of light over an acre of land. And the ballast and lamp are easy to install and maintain.)

So if you agree that there's no point in asking for trouble, talk to the people at Sylvania. It's easier than giving your employees karate lessons.
If a pipe line clogs or fails in a building, a repair crew is called in. Usually a carpenter tears a hole in the building to locate the leak; a plumber replaces the leaking pipe; a plasterer patches the hole and a painter dresses up the plaster. The costs are extremely high and going higher each year.

Through the years the one pipe that has stood the test of time has been Byers Wrought Iron pipe. And as you can see from the above photographs and services, some of the nation’s best known architects and engineers are not taking any chances with just ordinary pipe when they write their specs. What about you? Are you specifying Wrought Iron pipe for your corrosive services? ... Can we send you information on where and why Wrought Iron is being installed? Let us hear from you.

Thanks for reading this advertisement

A. M. BYERS COMPANY
P. O. BOX 369 AMBRIDGE, PA. 15003
... clear lights and soft sounds. Come inside to Dimensionaire*: an environmental ceiling system by Owens-Corning Fiberglas. It's a totally integrated air, light and sound system for people who want a better working environment.

For example, Mr. Mills, engineering project manager for the Permacel Corporation, wanted to improve their working environment. We gave him the chance with Dimensionaire. A system that could answer many environmental problems.

Mr. Mills had the major problems of getting uniform air distribution in rooms of non-uniform size and yet have design flexibility allowing for possible office rearrangement. He considered the use of ducts and diffusers—they were too expensive and not flexible enough for his needs. He then turned to Dimensionaire. It has a multi-vaned linear air bar which moves air in a unique pattern. Leaving no hot or cold corners. No stale corners. Just a totally fresh outlook. And with uniform wall-to-wall diffusion the Dimensionaire system allows for sufficient design flexibility.

Dimensionaire also gave him a coordinated lighting system with shallow recessed units. That gave comfortable illumination at working levels (200 foot candles on drafting tables). They also gave a clean uncluttered appearance that's easy on the eyes, too.

Dimensionaire then went easy on the ears. Breaking the noise barrier with ceiling boards of Fiberglast fissured design that absorb 85% of sound striking the surface.

Dimensionaire also went easy on Mr. Mills' budget. Eliminating separate material costs for ducts and diffusers, lighting units and acoustical ceilings. Just one system. From one company—Owens-Corning Fiberglas. Mr. Mills improved his working environment with Dimensionaire: An environmental system by Owens-Corning Fiberglas. Shouldn't you?

Write for detailed case histories and cost analysis on the Dimensionaire Ceiling System to: Owens-Corning Fiberglas Corp., 717 Fifth Avenue, New York, N.Y. 10022.

---

*Trademark (Reg. U.S. Pat. Off.) OCF Corp.
†Trademark of OCF Corp.
It takes our kind of experience to build our kind of doors.

And your kind of imagination to utilize them to their optimum potential.

More and more creative architects are discovering more and more ways to use The "OVERHEAD DOOR" to improve their designs—improve them functionally, economically, and esthetically.

You can do the same.

The "OVERHEAD DOOR" is available to you in just about every material, size, and style. You name the kind of door you need, and if we don't have it in stock, we'll build it for you. And build it right. (We've built over eight million doors since 1921, so we're pretty much in practice.)

If your design calls for an electrically operated door—or doors—we have architectural consultants and engineers at the ready to help you determine the right electric operator to do the best job.

You can always specify The "OVERHEAD DOOR" with total confidence. Our nationwide network of factory-trained distributors install and service every door they sell. They also issue a full one-year warranty on all parts and workmanship.

Your nearby Overhead Door distributor is listed in the white pages of your phone book. Give him a ring... and an opportunity to explain why the phrase "or equal" is fast disappearing from door specs all over America.

Fully transistorized, portable transmitter with color-coded selector, controls up to 8 doors individually by radio control.

Nationwide
Sales • Installation • Service

THE
OVERHEAD DOOR
TRADE MARK
SINCE 1921

OVERHEAD DOOR CORPORATION
General Offices: Dallas, Texas 75202
Manufacturers of The "OVERHEAD DOOR" and electric operators for residential and commercial buildings
For more data, circle 97 on inquiry card
$1183 was spent to soundproof this office and you can hear a cough in the next room!

They forgot an Acoustilead plenum barrier.

Soundproof wall materials, plus expensive acoustical ceiling tiles, were specified to make this a noise-free office. These materials do the job... up to a point. That point is the plenum, the space between a partition top and the floor slab above it.

Sound waves flood over the partition virtually unimpeded if there is no acoustical plenum barrier. Ordinary sound barriers in a plenum are usually so full of leaks around ducts and pipes that noise still passes freely.

Gain Maximum Noise Reduction at Minimum Cost. The solution to this annoying problem is Asarco Acoustilead—sheet lead that’s only 1/64-inch thick. Drape a curtain of Acoustilead from the floor slab above to the top of the partition and you stop penetration of all normal noise. There are no sound leaks because Acoustilead fits tightly around ducts and wires. It can be cut with scissors, easily bent by hand, and is installed in less time than other acoustical materials.

Acoustilead is the first material available for sound barriers in normal plenum areas, with an installed cost generally below $1.00 per square foot.

Help. Our brochure on Acoustilead shows why and how to install thin sheet lead. Send for it today. Sound Attenuation Department of Asarco.
SELECT THE FINEST

GJ 80M HD
non-handed surface door holder

stops the door
• cushions the stop
• holds the door

GLYNN • JOHNSON CORPORA TION
4422 N. Ravenswood/Chicago, Illinois 60640

For more data, circle 98 on inquiry card
Franciscan – the leading ceramic tile for leading architects.

Leading architects have discovered that Franciscan Terra Floor—a frost-proof, glazed ceramic tile in a nominal 12"x12" modular size—is everything a leading ceramic tile should be. Its rich earthy textures and colors with subtle irregularities offer unlimited opportunity for creative expression. Franciscan Terra Floor is easy to clean and will not yield its natural beauty to time and weather. Best of all—the installed cost of Franciscan Terra Floor is low enough to be competitive with less desirable materials.

Be a leader. Specify Franciscan Terra Floor—a functional art medium in burned earth for commercial and industrial floors. Select from eight patterns in six earthy colors.

Franciscan Terra Floor by INTERPACE
2901 Los Feliz Boulevard, Los Angeles, California 90039

For more data, circle 99 on inquiry card
Here is a lightweight Sonopan® Molded Fibre Pan.

Here are some of the things you can do with it.

SONOPAN molded fibre pans provide almost unlimited design freedom. What you see here are only examples of what you can do in concrete joist construction.

In the first place, the pans are available in a wide variety of standard and special sizes — in depths, widths and lengths. This variety means that you can design with new space dimensions and retain the aesthetic qualities desired.

Because of the texture of the material from which the pans are made, you get an acceptable concrete finish which can be left exposed or painted. Dome and tapered pans also available, and all pans are economically priced.

For more details, write for our illustrated brochure.

SONOCO PRODUCTS COMPANY, Akron, Indiana. Main plant and general offices, Hartsville, South Carolina.

For more data, circle 102 on inquiry card
For more data, circle 103 on inquiry card
Kawneer Entrances
Rugged—but beautiful

Why is a Kawneer entrance on the 50 yard line in Notre Dame Stadium? What better way to indicate rugged strength? Remember, the doors you specify must perform or you have an unhappy client.

Kawneer doors are engineered and constructed for superior performance, so essential where traffic is heavy . . . for example, the new Notre Dame Athletic and Convocation Center, where thousands of athletes, students, faculty and fans pass through 176 Kawneer aluminum doors.

The door features Dual Moment corner construction, with four sigma-deep penetration welds plus mechanical fastening at each corner.

Beauty? Your own eyes tell you best what we would like to say. The styling, hardware options and abrasion-resistant non-fading Permanodic® hard color finishes are all good reasons why more Kawneer entrances grace more buildings than those of any other manufacturer.

For details, write Kawneer Product Information, 1105 N. Front Street, Niles, Michigan 49120.

Kawneer Company, Inc., 1968
Specify floor beauty, that lasts long after final acceptance.

Hillyard Hil-Brite® (prime No. 1 Carnauba Wax)

PRODUC T DESCRIPTION — Basic Use: To provide a protective, slip-resistant, wear-resistant surface coating that enhances the appearance of any floor for which waxing is recommended.

Limitations: Do not wax a conductive floor. Not recommended for treatment of terrazzo flooring.

Composition and Materials: A buffable water-emulsion floor wax, containing 100% Prime No. 1 Carnauba. The hardness of carnauba improves the lasting qualities of the wax emulsion. Protects against rubber marking.Eliminates frequent rewaxing necessary with ordinary waxes.

Sizes: Packaged in new, sealed 1-gallon, 5-gallon, 35-gallon and 55-gallon metal, lined containers.

Applicable Standards: Conforms to Asphalt and Vinyl Asbestos Tile Institute Specifications for water emulsion floor polishes for use on asphalt and vinyl asbestos tile floors. Approved by Rubber Manufacturers Association.

TECHNICAL DATA — Nonvolatile Matter: 12.5%—13.5%; Ash Content of NVM: 3%; maximum; Refractive Index: 20°C: 1.3616—1.3831; pH: 25°C: 9.0—10.0; Sediment: 0.05% maximum; Odor: non-objectionable at any time; Alcohol Solubility: clear; Film Properties: film on black glass—clear; drying time at 25°C, 50% F.H.: 20 minutes maximum; tackiness — none.

Test Results: U/L listed for "slip-resistance." Approved by Institutional Research Council. All test information is available on request.

APPLICATION: Onto a perfectly clean and dry floor apply two thin coats of Super Hil-Brite® carnauba wax with lambswool applicator or clean rayon mop. Allow first coat to dry thoroughly before applying second coat. Let wax cure over night. Then buff for added lustre.

AVAILABILITY AND COST — Availability: Marketed in all states and in over 20 foreign countries by direct manufacturer’s representatives located in and near principal cities. Complete stock available in Hillyard Distribution Centers and Warehouses throughout the United States.

Cost: Approximate 0.3¢ (three tenths of a cent) per coat per square foot.

GUARANTEE: When applied in accordance with manufacturer’s directions, it is guaranteed to meet all claims made for it. Any unsatisfactory performance should be reported to the St. Joseph Office and a review of the complaint will be promptly made by an authorized representative.

MAINTENANCE: Sweep daily with properly treated dust mop. When surfaces become soiled, mop with Hillyard Super Shine-All® neutral chemical cleaner, at proper cleaning dilution. After floor is dry, buff for added lustre.

REFERENCES: Sweet’s Architectural Files.

A.I.A. File No. 11

TECHNICAL SERVICES: Over 200 trained professional, architectural consultants are located in and near principal cities. Write or call collect for our representative in your area. We will have him contact you immediately. He will recommend the proper, approved treatment for the floor you are specifying and supervise application procedures at job site.

HILLYARD FLOOR TREATMENTS
ST. JOSEPH, MISSOURI, U.S.A.
TOWA, NEW JERSEY
SAN JOSE, CALIFORNIA
IN CANADA: Ontario, Alberta

The most widely recommended and approved treatments for every surface.

For more data, circle 103 on inquiry card

For more data, circle 104 on inquiry card

For more data, circle 105 on inquiry card
PERMA-JOINT (TM)
from Tremco

The weatherproof joint on a horizontal traffic surface becomes a reality you can count on, with the new Tremco PERMA-JOINT sealant system.

PERMA-JOINT was developed by Tremco for joints in concrete decks, terraces, plazas, sidewalks, aprons, driveways and building perimeters.

Tremco field tests prove that PERMA-JOINT has greater life expectancy than most conventional horizontal joint sealants. This performance stems from its unique combination of excellent adhesion, extreme flexibility over a wide temperature range, superior ability to maintain a seal in dynamically moving joints and good abrasion and puncture resistance.

PERMA-JOINT is available in neutral stone and black colors. It passes Federal Specifications TT-S-00227c.

We could tell you a lot more about non-staining PERMA-JOINT, but we think you'll profit from a face-to-face session with your Tremco representative about your particular sealant problems.

Like to meet him? Just let us know.

THE TREMCO MANUFACTURING COMPANY
Cleveland, Ohio 44104

For more data, circle 114 on inquiry card
Before you design your next hospital...

check AVM JAMESTOWN's know-how in "Intensive Care" casework

No other area requires such attention to layout and architectural design.

Experience has shown that every intensive care unit must differ from every other depending on type and size of hospital, type patients served, and the extent of surgical and post-operative treatment.

AVM JAMESTOWN casework for intensive care units can be ordered to suit exactly what is needed.

Every piece of our hospital casework is custom-built to your design requirements. Each fits the available space...no stock sizes to squeeze or stretch.

Please send me:

- Specifications for Metal Hospital Casework
- "Hospital Casework"
- "Blanket and Solution Warming Cabinets"

Name
Company
Street and No.
City, State, Zip

continued from page 200

ROOF INSULATION / Urethane Roof Insulation, reported to be strong, lightweight and highly efficient, has a low k factor, and will satisfy design requirements with substantially less thickness than traditional insulations. In tests according to ASTM standards, the insulation proved a thermal conductivity of 0.13 initially and 0.16 when aged. • Armstrong Cork Company, Lancaster, Pa.

ACOUSTICAL TILE / This ceramic acoustical tile is said to have a "perfect finish." The flame-spread, fuel-contributed, smoke-developed classifications are 0. The finish: natural unpainted; dry-clean, non-fade; bacteria-resistant. The tile is offered in five textures. • U.S. Perlite Corporation, Chicago.

HIGH-HUMIDITY PANELS / These ceiling panels have been developed particularly for use in high humidity areas such as industrial plants, swimming pools and restaurant kitchens. In addition, they can be used in exterior areas, where they could be exposed to freeze-thaw cycles. The panels, which have a two-hour fire rating, may be washed or painted without producing any appreciable loss in acoustical properties. • Conwed Corporation, St. Paul, Minn.

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A comprehensive, authoritative textbook, fully illustrated, complete with statistical tables, calculations and charts, giving abbreviations, definitions and recommended symbols.

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OK, load our raised floor with 8,000 pounds on one foot!
(but don’t try it with any other floor)

WacoPlate Raised Floors provide two advantages you won’t find in any other floor. Anywhere. One is more strength than any other floor. You avoid problems like deflection and dimpling, or costly reinforcement to meet later — possibly unforeseen — requirements.

Why do other floors lack the strength of WacoPlate? Can’t be because a weaker floor avoids problems. Or saves you money. WacoPlate prices are competitive.

The second exclusive advantage of WacoFloors is that they provide complete accessibility without sacrificing stability. The explanation is our Snap-Lok Rigid Grid System. The stringers in this grid system give the floor rigidity, strength and stability, yet they are easily removed and replaced. No loose fasteners are required.

WacoFloors are installed with panels of steel or wood core. For complete details, dial direct or write.

WASHINGTON ALUMINUM CO., INC.
Knecht Ave. at Penna. R.R. • Baltimore, Maryland 21229
301 / 242-1000
There is no equal to a WacoFloor

For more data, circle 117 on inquiry card
Durability—Shall be permanent, with no protective coating necessary. Shall not discolor, tarnish or fade in virtually all atmospheres.

Appearance—Shall not stain or discolor adjacent surfaces; shall blend with other materials.

Strength—Shall protect against fire by maintaining its strength at elevated temperatures. Must offer superior resistance to metal fatigue, wind damage, denting and abuse.

Workability—Shall be readily formed, joined and installed in roof and flashing systems at any desired gage. Joints shall be easily soldered watertight.

Maintenance—Shall require no maintenance; normal rainfall to keep surface clean.

Cost—To be compatible with other permanent roof and flashing metal systems.

Availability—Shall be in stock for prompt local delivery to meet construction schedules.
Wouldn't it be great to write specs like this for a roofing material?

You can, you know...
what you'll get is a Republic stainless roofing system

And you'll get further benefits, too. The high strength-to-weight ratio of stainless allows lighter, more economical gages to replace heavier, more expensive (and less available) gages of copper in most roofing and flashing specifications.

Now Republic offers this surprisingly economical material in two tempers: a roofing grade type 304, and a new strong, yet easy-to-work, stainless flashing grade, Republic DUROFLASH®, a soft stainless.

Soft stainless means just that. A workable stainless that can be soldered, welded, brazed, nailed, riveted... even cut with scissors and formed by hand, on the job.

And it has the same durability and corrosion resistance you expect from stainless. Plus a yield strength of 35,000 psi (maximum).

Leading architects have already accepted Republic soft stainless. On the 41-story Federal Office Building at Foley Square in New York City, more than 55 tons of stainless steel were used for spandrel and through-the-wall flashing. Republic stainless was also used exclusively in the complete new roof installed on the Birmingham, Alabama, Civic Auditorium.

Designing and Specifying Stainless Steel in Built-up Roof and Moisture Protection Systems.

The newest information on stainless steel in roofing systems is now in a new booklet which is yours for the asking. It contains complete specifications and details plus tables comparing the properties of roofing and flashing metals.

Write to Republic Steel Corporation, Dept. AR-6751, 1441 Republic Building, Cleveland, Ohio 44101. And we'll include a sample of Republic DUROFLASH which will tell you more than we can about the workability of this new soft stainless.

This table illustrates the recommended applications of regular Republic 304 grade stainless, and new Republic DUROFLASH, the soft stainless.

### Stainless Steel Types, Gages, Finishes, and Tempers FOR ROOF AND FLASHING SYSTEMS

<table>
<thead>
<tr>
<th>Use</th>
<th>Product Description and Finish</th>
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<tr>
<td>Exposed Flashing</td>
<td>Specify temper rolled AISI type 304 No. 2 (strip) or No. 2B (sheet) conventional annealed finish.</td>
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<tr>
<td>Roof Trim</td>
<td>Where a semibright reflective treatment is desired . . .</td>
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<tr>
<td>Roofing</td>
<td>Specify temper rolled AISI type 304 No. 2 (strip) or No. 2B (sheet) conventional annealed finish.</td>
</tr>
<tr>
<td>Roof Drainage Accessories</td>
<td>Where a softer, less reflective treatment is desired . . .</td>
</tr>
<tr>
<td>Expansion Joint Covers</td>
<td>Specify temper rolled AISI type 304 No. 2 rough rolled (Republic No. 2 RSK) conventional annealed finish.</td>
</tr>
<tr>
<td>Roof Drainage</td>
<td>Specify cold rolled (65 to 80,000 psi yield strength) AISI type 304 No. 2 (strip) or No. 2B (sheet) conventional annealed finish . . . appearance—semibright.</td>
</tr>
<tr>
<td>Concealed Flashing</td>
<td>Specify soft temper (dead-soft or fully annealed) AISI type 304 No. 1 (strip) or No. 2D (sheet) conventional annealed finish . . . appearance—DUROFLASH.</td>
</tr>
<tr>
<td>Roof Penetration Flashing</td>
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<tr>
<td>Miscellaneous Items</td>
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GOING UP
Another HOSPITAL sealed with Dow Corning 780 building sealant

COMING UP
30 years of freedom from leaks!

This silicone rubber elastomer is so uniquely weather-resistant, industry sources project 30 years or more of leak-free service when the sealant is properly applied in a well designed joint.

That's ten years longer than they project for any other class of sealant!

Put Dow Corning® 780 building sealant at the head of your list of long-life components. It belongs. Why design for anything less?

See Sweets for Dow Corning 780 building sealant and Terraseal 100® polyurethane sealant for horizontal traffic joints. They're both extra long life. Or drop us a line for FREE DEMONSTRATION SAMPLE and full particulars.

Address Dow Corning Corporation, Dept. A-8411, Midland, Michigan 48640.

Offer good only in U.S.A.

DOW CORNING

For more data, circle 119 on inquiry card
Should all your clients' security be your concern?

You may be specifying a TELKEE key control system for some hospitals, schools and industrial complexes; but overlooking it on buildings where there are only a few locks.

A TELKEE system of key control is so simple, so relatively inexpensive, with so many advantages for your client, that it ought to be included whenever your hardware specifications call for 20 locks or more.

TELKEE means security, economy, convenience for every lock in every building . . . for restricted areas, storage of valuable supplies, confidential files, for any item with a lock. TELKEE guards against key loss and costly lock rekeying.

See Sweet's Architectural File or write today for your complete A.I.A. File: TELKEE Box 910, Glen Riddle, Pennsylvania 19037.

Specify a

TELKEE

SYSTEM OF KEY CONTROL

For more data, circle 116 on inquiry card T-104

For more data, circle 120 on inquiry card
How to stop people in your buildings from being glared at
PPG Feneshield® fabrics: the environmental-control drapery system

With scientifically-rated Feneshield fiber glass drapery fabrics you can bounce glare from sunlight, sky, other buildings, and metal or water surfaces right out of the room. Natural light still filters through. Eyestrain is eliminated. Room occupants are more comfortable and efficient.

With the Feneshield fabric rating system, you can choose fabrics scientifically to cut solar heat up to 65%, modify or improve a view, and even improve interior sound control. Your building will retain the clean lines of your original design concept. In addition, Feneshield fabrics cost less to maintain than mechanical shading devices.

For documentation and additional data, read our book about Feneshield fabrics. Mail the coupon.

PPG makes the yarns only, not the fabric.
PPG INDUSTRIES, Fiber Glass Division
One Gateway Center, Pittsburgh, Pa. 15222
The "hidden" features of TATE Infinite Access Flooring

After the floor panels are in place, in a computer room, office area, or other access flooring installation, some of the best features of a Tate Infinite Access Floor are hidden from view.

But, when you look underneath, you'll discover these hidden features which make a Tate Access Floor the finest you can specify.

First, you'll see the underside of the Tate all steel panel. It's constructed of two steel sheets; the top perfectly flat to receive the floor covering of your choice . . . the bottom sheet die-formed into fourteen intersecting "Z" beams for maximum strength . . . the two parts welded together at 176 points.

Next, one of three understructure systems that are available; each designed to meet a different need based on your requirements.

Your requirement could be for the Tate Snap-on Stringer that provides a rigid grid, but with each stringer individually removable by hand without special tools. You may require maximum accessibility, and the Tate Stringerless system is what you'll find. But if the most rigid floor understructure is your requirement, the Tate Bolted Stringer system, with only one bolt needed to secure four stringers, is there.

Supporting the system is the Tate "Levelock" pedestal. It consists of a tubular steel column, then the Tate "cam-lok" feature that prevents vibration or routine cable maintenance from changing the height and leveling setting. A steel adjusting nut — a ¾" steel stud — both the strongest on the market. And the "Levelock" feature itself, exclusive with Tate floors — adjusts the pedestal for perfect vertical alignment by compensating for the normal sub-floor irregularities . . . it guarantees absolutely level floors, axial loading of understructure, and no "rocking" panels.

Thus, it's the "hidden" features, combined with the all important visible feature of attractiveness and perfect, level surface, that makes a Tate Access Floor the best you can specify.

TATE ARCHITECTURAL PRODUCTS, INC.
a division of Tate Industries
Montevideo Road, Box 349C, Jessup, Maryland 20794 (301) 799-4200

Circle 312 on inquiry card

ACRYLIC LIGHT / This acrylic sculptured ceiling light consists of 12 clear acrylic tubes of varying lengths, the longest about 12 in., set at different positions in a solid black acrylic sheet. The unit is made to set into an acoustical 2-ft by 4-ft grid system. • Trimble House Corporation, Atlanta.

Circle 310 on inquiry card

LOW-WATT LAMP / This 150-watt, 120-volt tungsten-halogen lamp has been made possible, the manufacturer says, through "a filament coil design which allows the unit to be operated on normal household current." The new light source is said to maintain 100 per cent of its initial brightness throughout its useful rated life. • Sylvania Electric Products Inc., New York City.

Circle 311 on inquiry card

CLOSED CELL FIXTURES / This closed-cell gasketed fixture eliminates unsightly studs used to hold the diffuser in place. With cam latches (4 ft by 4 ft and 6 ft by 8 ft), no tools are needed to remove diffuser for maintenance. Uses include food processing locations or where strong drafts or steam may cause problems. • Wheeler Reflector Co., Inc., Hanson, Mass.

Circle 312 on inquiry card
Here's a $3,500 replacement!

Here's a low-cost way to replace incinerators and still handle large volumes of trash from high-rise buildings.

Simply place this small, powerful packer under an existing incinerator chute, attach a container, and drop refuse into PowerMite's charging box.

Over 42,000 pounds of hydraulic pressure crushes waste to a fraction of its former volume inside a detachable container. Bottles, paper, boxes, tin cans, garbage...PowerMite handles it all. Waste is reduced as much as four to one, EVEN MORE, depending on the material.

When container is full, a truck-mounted handling unit picks up, hauls, empties, and returns the container to its original packing position.

When a space is tight, PowerMite saves the day. The packer takes up a little over 44 square feet of space and can be fitted with a variety of hoppers and chute connections. Small, detachable containers can fit out through narrow hallways and roll under low ceilings.

Your Dempster Consultant will help you design a refuse disposal system at no obligation. Write today for his name and for more information on the PowerMite!

To: Dempster Brothers, Inc. • Knoxville, Tennessee 37917 • Dept. AR-10
Send me name of Dempster Refuse Consultant.
Send more PowerMite information.

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COMPANY ___________________________
ADDRESS ___________________________
CITY ___________________ STATE ______ ZIP ______

For more data, circle 722 on inquiry card
Guaranteed to retain its insulation efficiency for 20 years ...at least.

FOAMGLAS-BOARD roof insulation

In FOAMGLAS insulation, dry air is trapped inside millions of water-proof, closed cells. And, because it's cellular glass, it has very high compression strength and dimensional stability, and provides a rigid base for built-up roofing.

The beveled edges form continuous passages to relieve vapor pressure which can cause wrinkling and buckling of the roofing.

Only FOAMGLAS is guaranteed to retain its insulation value, compressive strength and incombustibility, and not to absorb moisture for 20 years. Send for a copy of the guarantee and a sample of FOAMGLAS-BOARD, the ideal insulation for roofs, floors, plazas and parking decks.

Write Pittsburgh Corning Corp., Dept. AR-108a, One Gateway Center, Pittsburgh, Pa. 15222. In Western Europe, contact Pittsburgh Corning de Belgique, S.A., Brussels.

For more data, circle 123 on inquiry card
Unique insulation system automatically slopes a flat roof deck for drainage.

Start with a flat roof deck. Place the precut tapered FOAMGLAS insulation blocks in sequence. You’ve got a perfectly sloped roof.

Unlike fills, tapered FOAMGLAS is cellular glass, absolutely waterproof. The roofer himself can install it and roof over it immediately.

When tapered FOAMGLAS roof insulation is installed, you can be sure it will stay waterproof, and will retain its original insulating efficiency, compressive strength and incombustibility. That’s guaranteed in writing for 20 years.

For a free sample and literature, write Pittsburgh Corning Corp., Dept. AR-108, One Gateway Center, Pittsburgh, Pa. 15222. In Western Europe, contact Pittsburgh Corning de Belgique, S.A., Brussels.

The Insulation People

For more data, circle 124 on inquiry card
Truss or Ladur Type masonry wall reinforcement—We make both so which will it be?

We recommend Dur-O-wal® Truss...
Here are ten good reasons why

You’re looking at the most efficient masonry wall reinforcement ever devised, Dur-O-wal Truss Design.

1. You can’t beat the truss for performance, adding both flexural strength and stability to masonry walls.
2. Dur-O-wal Truss is the original masonry wall reinforcement and is used in more masonry walls than any other brand.
3. Dur-O-wal Truss carries material approvals from three important building codes: BOCA, IBCO, SBCC and many state and local codes.
4. Dur-O-wal Truss is available in a wide selection of shapes, sizes and finishes. You can reinforce almost any masonry wall—single wythe, cavity or composite.
5. Dur-O-wal research is the most extensive in the business. We back up every claim for our product with independent research.
6. When you need Dur-O-wal Truss you can get it. Over eight thousand dealers stock and sell our product.
7. Dur-O-wal Truss is nationally distributed.
8. Dur-O-wal has trained factory representatives who can help you with reinforcing problems.
9. A constant supply of technical literature based on current research is available to you.
10. Dur-O-wal offers additional products exclusively for masonry construction, all backed by the same reputation for quality.

Questions on masonry wall reinforcing applications? Just write to Dur-O-wal, P.O. Box 368, Cedar Rapids, Iowa 52406.

For more data, circle 725 on inquiry card.
ZERO Exterior Saddles shown above are only six of 177 full-size drawings found in our new 1968 catalog. Write for your copy today.

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CONTROLED ENVIRONMENTS / A portfolio of technical reference information covers a broad series of environmental-control rooms and suites designed especially for audiological examination, psycho/bio-acoustic research and associated studies by medical and life scientists.

• Industrial Acoustics Company, Inc., Bronx, N.Y.*

Circle 413 on inquiry card

RED CEDAR SHAKES AND SHINGLES / Shingles and shakes for non-residential buildings have been pressure-treated to meet Underwriters' Laboratories, Inc. Class "C" fire protection requirements. An eight-page booklet pictures examples of their use.

• Koppers Company, Inc., Pittsburgh.*

Circle 414 on inquiry card

WALL REINFORCEMENT / A four-page report describes basic uses and limitations of truss-design horizontal joint reinforcing in masonry walls. Packaging, finishes, grades, shapes and sizes, as well as standards are discussed and illustrated.

• Dur-O-waL National, Inc., Cedar Rapids, Iowa.*

Circle 415 on inquiry card

INDOOR-OUTDOOR CARPET / A color brochure and a card of 12 color samples presents Wearathon, a carpet that needs no adhesive for installation. Reported characteristics: carpet lies flat without buckling, and won't stretch or shrink; fibers don't absorb spills.

• Armstrong Cork Company, Lancaster, Pa.*

Circle 416 on inquiry card

HIGH INTENSITY LAMPS / "High Intensity Discharge Lamps" is a 28-page booklet covering the physical, electrical, and performance characteristics of lamps in three principal categories: standard mercury, Multi-Vapor and Lucalox lamps.

• General Electric Company, Cleveland, Ohio.*

Circle 417 on inquiry card

* Additional product information in Sweet's Architectural File

For more data, circle 326 on inquiry card
Only Summitville offers a complete line for your feats of clay

The Summitville extruded quarry tile line is the most complete anywhere. From one source you will find a size, a shape, a color, a texture, a style for every function, every structure. This broad line provides a selection so versatile that you are provided with virtually unlimited design possibilities...floors and walls with a flair, so many styles, colors and patterns that you can create your own feats of clay. Check the complete Summitville line in Sweet's or contact your Summitville rep, distributor or tile contractor.

Contourettes
...miniature Contoured Quarry Tile. Available in 4 shapes, 5 natural earth colors. Shipped 1 sq. ft. sheet mounted.

Quarryettes
...miniature Quarry Tile available in 1 sq. ft., sheet mounted 1" x 1", 1" x 2" and 2" x 2" sizes...5 natural earth colors and standard blends.

Quarry Tile
...available in 6 natural earth colors famous for consistency of quality and color.

Contoured Quarry Tile
...available in ten classic shapes, 6 natural colors and 5 exclusive, super-tough antique floor glazes.

Lombardic Handcrafted Tile
...authentic "hand-made" appearance yet extruded for highest resistance to wear and weather. Available in a variety of sizes, shapes and hard-glazed colors.

Summitcrest Commercial Carpets
...the complete line of quality carpeting...all leading fibers. For complete information, contact your Summitville Rep...He's listed in Sweet's Architectural File.

Summitville® TILES, INC.
SUMMITVILLE, OHIO • TELEPHONE AREA CODE 216/223-1211
Member/Tile Council of America, Inc. • Member/Producers Council
We think big in overhead-type doors. (we think small, too)

Raynor custom builds doors big enough for giant diesel engines or small handcars. Matchless production facilities provide you with size ranges to expand your design limits. Available in wood, Raylon (fiberglass), aluminum or steel. Only Raynor custom manufactures every component in quality conscious Raynor plants to assure smooth, trouble-free operation and longer life. Even springs are custom wound and load tested before they're matched to each door. Next time you specify overhead-type doors, depend on Raynor to deliver the size you need — the style you want — and the quality to protect your reputation.

RAYNOR
The Brand You Can Depend On

Please send me free literature on Raynor garage doors.
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ADDRESS __________________________________________
CITY _______ STATE ________ ZIP __________

For more data, circle 137 on inquiry card

For more data, circle 138 on inquiry card
now...a multizone-rooftop unit for the architect who wants the
VERY BEST

We took longer to produce our new "Benchmark" series
Multizone-Rooftop Unit because we wanted to offer superior
Schemenauer quality. And now you have it... handsome on the outside,
unique on the inside. Constructed of weather-tight aluminum and
fiberglass, the attractive, low silhouette air processing unit offers
complete temperature/sound insulation. It features our unique "now or
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dehumidification package within the existing cabinet at a later date.
Cooling system provides redistribution of heat to cooler zones—providing
"free-heat" during the cooling cycle. All air is dehumidified to assure
positive humidity control in all areas. Oversize dampers move just
45° to open and close, admitting air with greater accuracy. If you want
to cool, heat and ventilate simultaneously, write for our new
catalog No. 1500—it'll be like a breath of fresh air.
Schemenauer Manufacturing Company, Holland, Ohio 43528

For assurance of quality in heating, air conditioning and ventilating equipment, insist on this Schemenauer benchmark.

For more data, circle 139 on inquiry card
the bigger they are...

the better you'll like Ty-Seal joint gaskets!
First, large diameter cast iron soil pipe and fittings can be joined faster than ever before. Second, gaskets make better seals than lead and oakum and still safely permit up to $5^\circ$ deflection. And third, they work rain or shine (even under water) cutting job delays to a minimum.

For that next “big” rough-in project, specify Tyler plain-end pipe and fittings with the gasket that makes faster joints — better joints and comes in all sizes up to 15” . . . TY-SEAL!

TYLER PIPE INDUSTRIES

SOIL PIPE DIVISION
TYLER PLANT, TYLER, TEXAS
PENN PLANT, MACUNGIE, PA.

TYLER pipe industries

Most victims survive first heart attacks. Like this farmer, 3 out of 4 survivors go back to their jobs.
More than 133.5 million Heart Fund dollars invested in research since 1949 have helped make possible great advances in diagnosis, treatment and rehabilitation.

Nevertheless heart attack kills 560,000 in the U.S. annually. Fight this Number 1 killer with the best weapon you have — a generous gift to the Heart Fund.

GIVE ... so more will live

HEART FUND

Contributed by the Publisher
Building abroad?

Save export dollars.

Use the computerized VAR M3 Modular Coordinated Building System.

Leading American and European companies already have chosen this economic, flexible and rapid method of construction.

ESSO

ALITALIA

MASSEY-FERGUSON ICM

COUNTY COUNCIL HOUSES

- Rome Head Office. 170,000 cubic meters. Steel structure. Feal aluminum window frames and sun breakers Duranodic 300(1) bronze treated. Tedlar(1) finished panels for white upper cornices.
- International Headquarters. Curtain walls: 8,500 square meters. Feal aluminum window frames and Duranodic 300 panels anodized in three different bronze shades.
- Industrial complex at Aprilia. Entirely built by the Feal VAR M3 system. Factory: 35,000 square meters. Offices: 14,000 cubic meters. Social Services: 8,000 cubic meters.
- Apartment dwellings. Modular coordinated components produced, assembled and erected according to the Feal VAR M3 system.

The Feal system, developed by Italian engineer Giovanni Varlonga, is based on a module of 30 centimeters and its multiples coordinated through the IBM 360/20 computer. No restrictions on building materials. No limits to the architect’s freedom of design. A highly versatile system adaptable to all kinds of industrial, commercial, institutional and private shelter construction. Complete information available from Feal’s Development Division.

THE SOVIET PAVILION AT EXPO 67 MONTREAL

For more data, circle 140 on inquiry card.
Stainless Steel Accessories by Parker

ANOTHER 1st BY PARKER
Two complete lines are available with either rectangular or round flanges. Manufactured completely of type 302 bright lustre or satin finish stainless steel (including concealed fastening device).
Write for brochure on complete information and specifications!

SONICWAL • STC 38
Acoustically rated wood folding partitions
Panelfold combines twin walls of acoustically damped high density panels with a system of deep nesting and posts and field adjustable perimeter seals to offer you an outstanding folding partition for sound control. We invite you to specify SonicWal® in genuine wood or Formica® clad.

Just another Heat Transfer Coil?
NONSENSE!
Smooth-fin design gets the credit. Its tapered shape puts every inch of transfer surface to work. There's room for more fins—more heat exchange per sq. ft. of compact space—higher air velocities with less turbulence are possible and practical.
Water coil drainage is positive—heating coil drainage and venting is greatly improved. Aerofin coils are lighter even though framed in rugged pressed-steel casings.
But there's more. Aerofin completely engineers coils to fit today's most sophisticated heating and air conditioning fan-system applications. Complex mechanical and thermal calculations are made. Collateral factors are objectively evaluated: pressure drops—turbulence and velocity variables—stainless steel or copper tubes with correct diameter and fin-spacing efficiencies—fluid fouling factors—and header designs for easy banking in stacks or connecting to duct work.
Specify dependable, true-rated Aerofin Coils and get maximum performance. Comfort control of America's showcase structures offers testimony to that promise.

AEROFIN CORPORATION
Lynchburg, Virginia 24505
Aerofin is sold only by manufacturers of fan system apparatus. List on request.

For more data, circle 144 on inquiry card
For more data, circle 134 on inquiry card
RESISTANT MORTARS / A quick reference chart shows the resistance of nine types of mortars to more than 200 chemicals. Silica and silicate, resin and sulfur mortars, with maximum service temperatures ranging from 200 to 2000°F, are listed in the four-page bulletin. * Pennsalt Chemicals Corporation, Philadelphia.

Circle 418 on inquiry card

GIRDERS / Literature explains the use of welded steel lattice girders in floor, roof and wall systems. The literature describes a system which it says "has proven to be more economical than conventionally poured-in-place slabs or competitive precast floor systems." * United Filigree Corporation, Edison, N.J.

Circle 419 on inquiry card

REFRIGERANT CONDENSER / A product information/purchasing guidebook covers six types of water-cooled refrigerant condensers available in 134 models with a capacity range of from 2 to 275 tons. Data charts and statistical tables supplement text throughout the 20-page booklet. * Acme Industries, Inc., Jackson, Mich.

Circle 420 on inquiry card

OFFICE PLANNING / A 20-page book illustrates the 3200 Series desks and includes schematic drawings with dimensions. Typing units, convertibles, credenzas and work tables are also shown. * Steelcase Inc., Grand Rapids, Mich.

Circle 421 on inquiry card

REFRIGERATOR SYSTEMS / Information and specifications on matched refrigerator system is available in a 20-page catalog. The system is a combination of the AHP Seasoncon condensing unit optionally matched with a refrigeration evaporator unit. * McQuay Inc., Minneapolis, Minn.

Circle 422 on inquiry card


Circle 423 on inquiry card

LATERAL FILING / An eight-page brochure covers design and economy possibilities with lateral filing systems. * Tab Products Company, San Francisco.

Circle 424 on inquiry card

* Additional product information in Sweet's Architectural File

For more data, circle 146 on inquiry card •

The Built-in Soda Dispenser

KENCO KLUB-MATE

The only compact self-contained commercially constructed soda dispensing system.

Convenient... does away with bottles and cans. Serves steady flow of chilled carbonated drinks, up to 3 flavors plus soda.

Economical... costs mere 1¢ a glass. Fits anywhere--just 26" wide, 15" deep, 42" high. Easy installation--plug in and connect to water line. A practical, prestige convenience your clients will appreciate.

Write for details:

KENCO PRODUCTS CORP. Englewood, N.J. 07631

SEE US AT: Nat'l. Hotel & Motel Exp., Coliseum, N.Y., Nov. 11, Booth 1007-1008
Internat'l. Soft Drink Exp., Cobo Hall, Detroit, Nov. 18, Booth 600
Nobody moves air like Spencer... moves it up, down, around corners... pushes it, pulls it, gets air to do thousands of jobs better, faster, cleaner, more efficiently.

Spencer's internationally famous "sugar-scoop" turbo-compressor is at the heart of many systems requiring the movement of air in various industrial situations on every continent. Spencer's Turbo-Compressor is a "must" requirement with designers and engineers needing a turbo component in their systems or assemblies.

Spencer Turbo-Compressors are available in wide ranges, capacities and ratings... Spencer will design and build a turbo-compressor to your very requirement... even determine for you what that requirement should be, if you like.

Spencer turbos are located in every industry serving as blowers, air curtains, gas boosters, as testing components, as fluidizers, on foundry cupolas, in car washes, in the furnace and combustion fields, for cooling, heating, removing liquid, ventilating, spraying and conveying. If you have an air movement problem write today for your free copy of CATALOG No. 126 or call your Spencer representative; he's in the Yellow Pages. Spencer is also a leader in the design and production of vacuum cleaning systems and pneumatic conveying systems.
International
Amphitheatre
Chicago, Nov. 11-15

Technical Conference on Plastics Developments and Applications

The Plastics Show is the fitting climax to the centennial year of the plastics industry. At the Conference, run in conjunction with the exposition, interesting seminars will cover exciting new plastics applications in industry now, and for the future—automotive, communications, agriculture, construction, home furnishings, appliances, packaging and others, as well as machinery developments and management problems relating to plastics.

Fill out the coupon below for the Conference program and for a rapid registration form to get you in the show quickly and easily.

Success is something you can't leave a son

In today's complex and specialized world, success depends more and more on whether he gets a college education.

But he may not be able to get one unless the nation's colleges can answer some serious questions: How to cope with rapidly increasing student enrollments? How to keep the quality of education constantly improving with more modern laboratories, better libraries, new classrooms? How to attract able new faculty members?

Your support will help colleges answer these questions...help them make your son ready for his world.

Give to the college of your choice.
Stone on plywood. Sanspray. These factory-finished stone panels could be the answer to an architect's prayer. Sanspray stone panels combine the benefits of plywood construction with the beauty, the durability, the lasting value of natural stone.

Sanspray. With it, you can apply a masonry-type finish at about the cost of frame construction. Worth thinking about, isn't it? Just saw and nail into place. Put up panels of lasting beauty in minutes. (Just like plywood, because it is plywood.)

No painting. No maintenance. Ever. The epoxy and stone surface is completely weatherproof, and can be installed in any weather. Stone on plywood. Sanspray. With more uses (industrial, commercial, residential) than even we can think of. Like siding, roofing, soffits, spandrels, interior walls, porch and house skirting, decorative fencing. Even decking. (Could be you will discover the next use for Sanspray.) Sanspray stone-on-plywood panels are available in six attractive natural aggregate colors. Like to know more about Sanspray? Return the coupon.
Sure the price tag is heavier...but only to save you money!

We do put extra metal, extra plating, extra care into Chicago Faucet bodies. For one reason alone: We expect them to last for years and years.

You see, Chicago Faucet design gathers all operating parts into one replaceable unit. This is unusual first because it closes with the pressure—works easier, stays leak-free longer. Then when service is needed you just drop in a spare unit, finish repairs at the bench. Best of all, if ever necessary you can completely renew the operating heart without disturbing the body or connections.

Does this Chicago Faucet idea really work? Can it promise to save you money? Ask anyone who bought Chicago Faucets 20, 30 or even 50 years ago.

Chicago Faucets offer the biggest line of laboratory fittings also. Ask for catalogs.

No. 897 Service Sink Faucet with integral vacuum breaker, adjustable wall brace, pail hook, adjustable supply arms with integral stops.

No. 967 Spray Head Lavatory Faucet, for today’s public washrooms. Reduces splash and water waste, permits washing in clean running water.

Dear Findley,

Cadwell and Belton, A.I.A.*

You certainly do know women. You even know that a lot of us use tampons rather than sanitary napkins. So those nice built-in machines that have both are appreciated by one and all. Thanks for thinking of us.

Sincerely,

Us lucky girls on the 13th floor.

Mary Joan, Ginny, Jackie

Almost half the women today use tampons. That’s why we suggest you specify built-in, dual vend machines. Bobrick Dispensers, Inc. makes some beauties that dispense both Kotex napkins and Kotex tampons. Send for free catalogue or see Sweet’s File No. 230 or Bobrick’s File 256.

True, you may not end up with a letter from the girls, but you’ll know you did right by them.

Kimberly-Clark Corporation
Commercial Department, Neenah, Wisconsin

*The names are fictitious, but the gratitude isn’t.

For more data, circle 752 on inquiry card

For more data, circle 152 on inquiry card
At room perimeter...

PUT TOTAL HEAT WHERE YOU NEED IT
WITH 3M ELECTRIC RADIANT HEATING PANELS

3M Brand Electric Heating Panels provide radiant heat, without noise or drafts, exactly where you want and need it.

Easiest of all heating systems to install, 3M Electric Heating Panels simply drop into standard 2' x 4' ceiling modules and are wired in. No pipes. No ducts. No furnace. Each area can have its own separate thermostat, if desired, to permit effective zone control to meet individual temperature demands. Ideal for new construction; easily adapted to even the most difficult remodeling jobs.

The ceiling panels in the above grocery store entrance, for example, provide sufficient warmth in critical areas such as this. The office installation, a conventional T-Bar job, puts heat where it's most efficient without costly, space-wasting ductwork other systems require.


For more data, circle 153 on inquiry card
Start with sprinklers, for wider choice of finishings.

Increase your range of interior finishing materials. When sprinklers are installed, you can use interior finishing materials of higher flame spread classifications. Who says so? The codes say so.

You can design with woods (birch, mahogany, even Douglas fir), fabrics, paints, carpeting, cork and plastics. With sprinklers, you can be more flexible in choosing interior finishings and fabrics which meet the aesthetic or economic needs of the owner.

And more. By designing-in an “Automatic” Sprinkler system, you can get:
1. Increased building area.
2. Increased building height.
3. Increased exit distance.
4. Savings with light roof framing.
5. Savings with metal roof decking.
6. Savings with fewer fire walls.
7. Increased fire wall openings.
8. Decreased exit widths.
Take a few minutes to scan your local building codes for the many specific advantages you can gain when you design-in an "Automatic" Sprinkler system. To help, we have compiled some of the permissive clauses from the four major building codes, and put them into a booklet called, "The Code Book.

For a copy, simply mail your request to Mr. R. L. Pardee, Manager of Marketing Services, "Automatic" Sprinkler Division, Dept. 1068, Box 180, Cleveland, Ohio 44141.

Here are quotations from the four major building codes regarding "interior finishing materials":

The Uniform Building Code: (SEC. 4203) "Class I finish materials shall be used except where the finish materials are protected on both sides by automatic fire-extinguishing systems . . ."

The National Building Code: (SEC. 810.3) "Interior finishing materials in buildings . . . shall not have flame spread rating greater than 75 in exit stairways, exit hallways . . . all portions of buildings more than 75 feet in height . . . or in all portions of buildings used for institutional occupancies, unless the building is sprinklered."

The Southern Standard Building Code: (SEC. 704.3) "In every building except one and two family dwellings, flame spread ratings for walls and ceilings using ASTM Standard E 84, shall not exceed the following . . ." (Check this section for non-sprinklered requirements.)

The Basic Building Code: (SEC. 925.6) "In buildings of all types of construction and in all use groups, combustible wall and ceiling finishes may be used without hesitation in any room or area except required exitways, provided the building is equipped with an approved automatic sprinkler system . . ."
Single, double, or triple service in one fitting with space for 1 to 5 amphenol jacks.
1, 2, or 3 services in one fitting
where and when you want it

Cel-Way: the underfloor electrification system that prevents building obsolescence! Its roomy steel cells and factory-installed inserts can be spaced to fit any building module for widest flexibility of desk or equipment placement... for now and for the future. Cel-Way's architecturally-styled fitting supplies all services to any desired location. This fitting pleases owners, decorators... fits unobtrusively under a desk pedestal. Cel-Way's pre-set inserts make it easy to relocate services; eliminate messy core drilling in concrete — a process that can cost up to $100 for each change. All things considered, Cel-Way is the most economical and practical in-floor electrification system, for either concrete or steel frame construction.

Check Sweet's 1J/Gr, or write for Cel-Way product manual. Granco Steel Products Company, 6506 North Broadway, St. Louis, Mo. 63147. A subsidiary of Granite City Steel Co.
if you were sure that one publication best served the interest of architects and engineers, would it make sense to place all your advertising there?

It would... if you can’t answer “Yes” to this question... “Am I doing the job I ought to be doing in the one publication that’s strong enough to do the job alone?”

THE PROBLEM YOU FACE
Typically the prime objective of advertising in the building market is to get architects and engineers to specify certain products into the buildings they design. One of the hurdles advertisers must overcome is that architects and engineers are among the busiest and most sought after groups of people in this country. Small in number they control through their specification practices, the selection of virtually every product that goes into our nation’s buildings. As a result they are deluged with Direct mail, catalogs, folders, brochures and salesmen flood into their offices. They can’t and don’t pay attention to them all. Under these circumstances how can you hope to get their attention? It’s simple. Do what they do and cut out waste and duplication. Go where they find value. Take all the available dollars and do your advertising in Architectural Record. Our editors already have their full attention and they cut your work in half. Make the rapport we’ve spent 76 years building with the profession work for you.

WHAT ARE THE BENEFITS?
The major benefit of using just one magazine in a field rather than two or more is that it frees money to do some of the other things that are necessary to attract the attention of busy, involved people. Achieving a measure of impact in your advertising is a relatively simple thing to do. Let’s take a look at some of the elements of impact: advertising and see how putting the same dollars to work in a single publication will help you achieve that goal.

Dominant space units... it’s a fact that on the average, larger space units get better readership than smaller ones. The advantages of 12 pages or 12 spreads in one strong magazine over six halves or six pages in each of several magazines is readily apparent. In short you can look bigger and seem more important and increase readership scores at the same time.

Maximum frequency... every available piece of research indicates that advertising readership scores also increase with frequency of insertion. The advertiser who runs in every issue of a publication gets higher scores than those who do not.

Strong copy and layout... while the basic strength of your copy and layout depend on the talent of your specialists, it’s possible to enhance these elements through the use of four-color. Architectural Record
is now offering substantial color premium discounts, similar to the traditional frequency discounts.

Thus by buying only the Record you get a double barrelled discount, your ads look better and you get the higher readership scores that come with color.

Consistency...the concept of consistency in impact advertising involves planning over a period of years not just months. Although the benefits seem obvious it is one of the hardest elements to sell to top management. In our experience the best way to achieve its acceptance is through the careful application of the other three elements — dominant space units, maximum frequency and strong copy and layout. Apply these three principles effectively and the advantages of consistency follow naturally and rewardingy.

WHY RECORD?
Architectural Record best serves the interest of architects and engineers. This is a fact documented in two ways. Both are significant to advertisers.

First... Architectural Record publishes more in the relevant areas of buildings, houses, architects, photographs, drawings and four-color than other architectural publications. And by a wide margin. In 1967...70 per cent more buildings than the second publication...192 per cent more houses...88 per cent more architects...85 per cent more pages of four-color than the second publication.

The second way to document the Record's editorial leadership is to go to the architects and engineers themselves as hundreds of building product manufacturers and their agencies have done in independent studies to determine the reading preferences of these key specifiers of building products. In seventeen studies conducted since January 1966, the Record has been the consistent first choice, winning all seventeen studies and usually by a 50 per cent margin over the second place publication.

The significance to advertisers is that there is a single publication in the architectural field which alone is strong enough to carry their advertising message. Clearly one publication is enough if it's the Record.

START NOW
Study your current advertising program. Make sure your impact on architects and engineers is not being watered down by buying more publications than you really need. Think about the extra selling power these same dollars could buy you in Architectural Record in terms of greater reader involvement, more four-color, better frequency and larger space units. Clearly one architectural publication is enough if it's the Record.
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When she can’t find the information you want, when you want it, it might as well be lost. Find it in Sweet’s.

All the product data you need is right in your Sweet’s Files. Sweet’s is your product information retrieval system. It contains information and specifications on products manufactured by more than 1,400 leading companies. The information is up to date and easy to find. And, in greater quantity than you probably know about.* It’s bound to be found in Sweet’s. It can’t get lost.

Sweet’s Architectural Catalog File, Sweet’s Industrial Construction Catalog File or Sweet’s Light Construction Catalog File. Sweet’s Construction Catalog Services, McGraw-Hill Information Systems Company, 330 W. 42nd St., New York, N.Y. 10036

*Example: Section 25 of your Architectural File contains 640 pages on bathroom and washroom equipment.

Sweet’s works.
TWIST UP FROM 19 TO 29 INCHES.
A quarter twist of the top allows the top to be raised or adjusted to any level from cocktail to dining height. Unique column construction* locks top at height selected. Round and square tops—available with patented CHF Rockedge®

Another outstanding design innovation—from CHF

*Patented

CHICAGO HARDWARE FOUNDRY COMPANY, NORTH CHICAGO, ILL. 60064 • 312/689-3770

For more data, circle 156 on inquiry card