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American Olean

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For more data, circle No. 1 on Inquiry Card.
Architectural Engineering

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New work of Harry Weese
Among the younger generation of architects, Harry Weese is one whose architecture is notable not only for sensitive interpretation of function and appropriate expression of it but also for its quality of recognizing its relationship to tradition while being entirely contemporary. Next month's special feature will present six major new projects, with special drawings by the architect.

Special-Purpose Schools
In the vast volume of school buildings reported and anticipated in the activity reports of F. W. Dodge Corporation, there seem to be appearing a growing number of new kinds of schools—special-purpose schools to serve the needs of particular kinds of students: the handicapped, the underprivileged, the delinquent, the gifted, and so on. Next month's Building Types Study on Schools will feature a number of these new types, plus the famous Andrews, Texas, High School designed by Reid, Rockwell, Banwell and Tarics as one of the first schools expressly planned for team teaching.
There's new simplicity in this university-designed thin-shell roof (made with reinforced concrete and Incor®)

Now there's a new and simpler way to form thin-shell concrete roofs in graceful hyperbolic paraboloid shapes.

Purdue University's golf starter house—an experimental research project—provides an instructive example of how it's done. Steel edge beams, supported on concrete piers, were interlaced with steel wires. Polystyrene foam slabs were then fastened to the wires and grouted in place to form a base upon which lightweight concrete made with "Incor" 24-Hour Cement was cast. As a result, the profusion of forms and supports usually required in H-P concrete construction was eliminated. And still further savings in time and money were assured by the use of "Incor"—America's first high early strength portland cement.
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Behind the Record

Sic Transit Transit

What the automobile has done to mass transit systems would seem to be obvious. And what it has done to our downtown cities is not difficult to observe. This particular observer was startled recently, however, to read some statistics on the steady demise of transit systems. These came in a paper by John C. Kohl, the assistant administrator for transportation of the Housing and Home Finance Agency. He also made some remarks on lack of attention given to it in most planning studies; perhaps some planners ought to see the statistics.

"Everywhere, in cities large and small," he wrote, "there seems to be a transit problem. In the seven years, 1954 to 1960, 131 transit operators quit the business, and were replaced in only 54 communities—77 urban areas completely lost mass transportation service. And, in the year just past, our new HHFA Office of Transportation has been in contact with 224 cities in 44 states.

"Yet, most community planners are still giving transit scant attention. Just five short paragraphs in 15 full pages of text dealing with circulation and parking appeared in a very recent report from a city noted not only for its progressive planning but for its civic accomplishments. In planning report after report from other metropolitan areas, public transportation is usually mentioned with some appropriate rationale discounting its significance . . ."

He continued: "Giving public transportation a fair consideration in urban planning does not, in my mind, portend any immediate cut-back in present traffic and highway demands. Growth, in vehicles and in their use, is still very much in the cards, but the community growth will be far healthier if we can achieve some real balance in our transportation.

"We need to adapt the principle of diversity to our urban transportation resources—good highways and parking for auto use, and good public transportation as an alternate and standby for selected services determined through comprehensive planning. Otherwise it may be 'drive or you don't go' for a lot of city people."

Some other statistics, these from Business Week: "Since 1940, the bus and rapid transit industries have lost 28 per cent of their passengers, have decreased vehicle-miles operated by 17 per cent, and trimmed employment by 41 per cent. A 92 per cent increase in revenue, through a seemingly endless series of fare hikes that drive still more people to their autos, has been outstripped by a 116 per cent jump in operating expenses."

Sic transit transit. Many large cities are turning, in their planning at least, toward mass transportation. San Francisco has voted a huge bond issue for a rapid transit system. Atlanta, Washington, even Los Angeles are working up plans. Philadelphia has successfully increased the use of public transit facilities, has strengthened its rail commuter systems, built parking garages near outlying rail stations. Boston is the scene of a huge experiment in rebuilding transit services.

President Kennedy is urging a huge Federal program of subsidies for expanding public transit facilities, on the ground that the Federal Government pays from 50 to 90 per cent of the cost of urban highways and freeways.

A worthwhile exercise is to figure out how many lanes would be needed by, say, 1980 for all of the people of that day to drive into a given downtown area, and then look at the physical city remaining. To build freeways for them would be, in the words of Lewis Mumford, "pyramid building with a vengeance; a tomb of concrete roads and ramps covering the dead corpse of a city."

—Emerson Goble

ARCHITECTURAL RECORD April 1963 9
The Quest for Quality in Architecture: The Role of Architecture as an Art" is the theme of the 95th Annual Convention of the American Institute of Architects, which meets May 5-9 in Miami Beach, Fla. A registration of 2,000 architects is anticipated.

Following two days of A.I.A. business sessions, the professional program will begin Wednesday morning, May 8, at the Americana Hotel, convention headquarters. Permanent moderator for the entire program will be Burnham Kelly, dean of Cornell University's College of Architecture. Speakers at one session will continue as panelists in succeeding sessions to provide unity for the entire program.

Sir Basil Spence, internationally known for his design of the new Cathedral at Coventry, England, will be one of the participants in the opening session devoted to "What Is Quality?" Others will be S. Robert Anshen, F.A.I.A., partner in the San Francisco firm of Anshen & Allen; Paul Rudolph, chairman of Yale University's Department of Architecture; and Dr. Edward T. Hall, anthropologist-psychologist, author of several books, including "The Silent Language."

"What (and Who) Influence Quality?" will be the second session topic, with speakers Nikolaus Pevsner, critic and author of "An Outline of European Architecture"; Karel Yasko, newly appointed assistant commissioner of design and construction for General Services Administration; and George McCue, critic and reporter, St. Louis Post-Dispatch.

Third and final professional session Thursday afternoon will be concerned with "The Attainment of Quality." Speakers will include critic Ada Louise Huxtable and architect John M. Johansen, New Canaan, Conn.

Five members of the A.I.A. Board of Directors comprise the planning committee for the professional program: William W. Eshbach, A.I.A., Philadelphia, chairman; Robert M. Little, F.A.I.A., Miami; Charles M. Nes, F.A.I.A., Baltimore; Oswald H. Thorson, A.I.A., Waterloo, Iowa; and Julius Sandstedt, A.I.A., Oshkosh, Wis.

Host Chapter Committee
A full schedule of social activities has been planned by the A.I.A.'s Florida South Chapter, host of this year's convention. They include a tropical garden tour, a tour of Palazzo Viscaya, one of the country's finest estates, two special events for the la
dies, and a "Tropical Night Caper," with Caribbean music and entertainment at Hialeah Park.

Host Chapter committee members are: Robert M. Little, F.A.I.A., regional director—Honorary Chairman; Earl M. Starnes—Chapter president; H. Samuel Krasü, F.A.I.A.—General Chairman; Wahl J. Snyder Jr., F.A.I.A., and Mrs. Wahl J. Snyder Jr.—Hospitality and Ladies Events; Alfred Browning Parker, F.A.I.A.—Reception; Russell T. Pancoast, F.A.I.A., and James L. Deen—Guidebook; Frank E. Watson, F.A.I.A.—Chapter Party & Entertainment; James E. Ferguson—Exhibits; C. Robert Abele—Tours & Transportation; Edward G. Grafton —Publicity; O. K. Houston Jr.—Student Program; Herbert R. Savage—Special Events; Vernor Johnson—Architects-at-Home; Charles S. Broward Jr.—Finance.

Related Meetings
Meetings of the Association for Collegiate Schools of Architecture will be held May 3-5 at the Balmoral Hotel, Miami Beach. The National Council of Architectural Registration Boards will hold its conference following the A.I.A. convention, May 10-12 at the Americana Hotel.

A.I.A. NAMES 35 MEMBERS FOR FELLOWSHIP

The American Institute of Architects will advance 35 members to the rank of Fellow at its 1963 convention May 5-9 in Miami. The list follows:

Roger Bailey, Salt Lake City—Education Charles Julius Betts, Indianapolis—Service to the Institute
Thomson Jones Biggs, Jackson, Miss.—Service to the Institute
Charles A. Blessing, Detroit—Design
John Savage Bolles, San Francisco—Service to the Institute
Clinton E. Brush III, Nashville—Service to the Institute
H. Griffith Edwards, Atlanta—Service to the Institute
James Harrison Finch, Atlanta—Design

James Herschel Fisher, Dallas—Design
William Edward Hartmann, Chicago—Public Service
Ernest Daniel Ivey, Atlanta—Public Service
Paul Henten Kea, Hyattsville, Md.—Service to the Institute and Public Service
Edward A. Killingsworth, Long Beach, Calif.—Design
Roger Yuen Lee, Berkeley, Calif.—Design
Sidney Wahl Little, Tucson—Education
Charles Luckman, Los Angeles—Public Service
A. Reinhold Melander, Duluth—Public Service
Willis Nathaniel Mills, Stanford—Design
Frank Montana, South Bend—Design
George Nelson, New York City—Design and Literature
Louis C. Page, Austin—Design
Harry Daniel Payne, Houston—Service to the Institute

William Gray Pureell, Pasadena—Design
I. Lloyd Roark, Kansas City—Service to the Institute
Reginald H. Roberts, San Antonio—Service to the Institute
George Thomas Rockrise, San Francisco—Public Service
Walter Sanders, Ann Arbor—Design and Education
John Scarchetti, Union City, N.J.—Service to the Institute
G. Milton Small, Raleigh—Design
Lee Soyer, Oklahoma City—Public Service
Victor Steinbrueck, Seattle—Literature
John Stetson, Palm Beach—Service to the Institute and Public Service
Charles Eatan Strickland, Boston—Public Service
Frank Edward Watson, Miami—Design
Charles Day Woodford, Los Angeles—Service to the Institute
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• Seattle, Wash., 3310 Wallingford Ave.
• Minneapolis, Minn., 2653 37th Ave. So.
• Hamilton, Ont., Canada, 789 Woodward Ave.

For more data, circle 5 on Inquiry Card
Library Will Adjoin Bristol Mansion

The new Margaret R. Grundy Memorial Library, Bristol, Pa., will be attached to the original Grundy mansion by a connecting passage, the old house to be used for special collections and research work. Walls of the new library are load-bearing masonry piers with exposed aggregate concrete and glass panels. Roof is of precast concrete, girders and roof plank. Estimated cost is $500,000. Architects are Carroll Grisdale & Van Alen.

Telecomputer Center Near Pittsburgh

Westinghouse Electric Corporation Telecomputer Center, a mile from Pittsburgh, will be hub of the company's communications system. The one-story, 30,000-square-foot structure was designed by architects Deeter & Ritchey as a one-piece system through which 14-foot-high aluminum members, while carrying the roof weight, also serve as mullions framing windows. Initial occupancy of building began last winter. Structure is to be completed next spring. Contractor is F. H. McGraw.

Engineering Building For Lancaster, Pa.

Skidmore, Owings and Merrill designed the three-level (one below grade, two above) engineering building for the Armstrong Cork Company. Metal and glass enclose upper levels from floor to ceiling. Roof overhang reduces glare, provides shade. Occupancy is scheduled for fall, 1964. Supervising the project is George A. Reinhard Jr., Armstrong director of engineering. Associate architect is C. S. Conrad Jr., Armstrong chief architect. Contractor is Turner Construction Company.

Student Center Planned for M.I.T.

General plans are completed for a $4,600,000 four-story student center at Massachusetts Institute of Technology. Eduardo Catalono, M.I.T. professor of architecture, is architect, in association with Brannen and Shimamoto. Basement and ground floor will house commercial facilities; main floor and mezzanine, social activities and dining; top floor, student organizations and individual recreation.
Pool-Skating Rink
For Central Park
Planned for the Harlem Meer section of New York's Central Park is the Louisa D. Lasker Memorial Swimming Pool and Skating Rink. The dual pool and rink, which can accommodate about 3,000 swimmers or skaters at one time, was designed by architects Fordyce & Hamby Associates. Budget estimate for the facility is $1,600,000. Floor slab of swimming pool will contain refrigerant piping for transformation from pool to rink. Area of oval swimming pool will be about 33,500 square feet. Uniform depth of water will be 3 feet 6 inches. Rink will be about 28,000 square feet. Brick and precast stone building adjoining pool and rink.

Luxury Hotel for L.A.'s Century City
Keystone for Century City, West Los Angeles high-rise commercial and residential development, joint venture of Aluminum Company of America and Zeckendorf Property Corp., will be the 22-story Century Plaza Hotel. Minoru Yamasaki designed the curving structure, which is to face the Avenue of the Stars, broad mile-long grand boulevard of Century City. The hotel's 800 rooms will each have a lanai and a view—northeast over Beverly Hills, the mountains and central Los Angeles or southwest to the Pacific Ocean. Its grounds will encompass three acres of terraced activity area, with pools, gardens and putting green. Underground parking will provide for 800 cars. Construction will begin in September, be completed by fall, 1965. The hotel management company will be Western International Hotels.
In its annual honor awards program for 1962, the Hawaii Chapter, American Institute of Architects, has cited three architects as recipients of Certificates of Merit and six as recipients of Honorable Mention awards. Photographs of the award-winning projects are shown here.

Winner Thomas Wells has designed an office building in which all offices face an attractive garden court. Alfred Preis intends the U.S.S. Arizona Memorial to have an over-all effect of serenity. The form, he says, low in the center, strong and vigorous at the ends, expresses "initial defeat and ultimate victory." The 14-story co-op apartment building designed by Wimberly, Whisenand, Allison & Tong and Howard L. Cook contains 12 complete homes, each with 2,500 square feet of living area and covered parking for two cars.

On the jury were: Takashi Anbe, A.I.A.; Vladimir Osipoff, F.A.I.A.; Kenneth Roehrig, A.I.A.; and Howard Wong, A.I.A.

Three Merit Awards

U.S.S. Arizona Memorial, Pearl Harbor, Honolulu
Architect: Alfred Preis, A.I.A.
Engineers: Alfred Yee Associates
Landscape Architect: George Walters, A.S.L.A.
Contractor: Walker & Moody, Ltd.

Office Building, Honolulu
Architect: Thomas Wells, A.I.A.
Engineers: Walter Lum Associates
Landscape Architect: George Walters, A.S.L.A.
Contractor: Haas & Haynie Corp.

Co-op Apartment Building, Honolulu
Architects: Wimberly, Whisenand, Allison & Tong and Howard L. Cook
Engineer: George Whisenand, A.I.A.
Contractor: E. E. Black
Six Honorable Mention Awards

Doyle Playground, Honolulu
Architects: Belt, Lemmon & Lo

Pershing Lo Residence, Honolulu
Architects: Johnson & Perkins

Denis Y. Wong Residence, Honolulu
Architects: Design Associates (Frank Slavsky, architect; L. H. Whitaker, designer)
Contractor: James K. Shimizu

Harris Memorial Methodist Church, Honolulu
Architect: Shizuo Oka, A.I.A.
Contractor: Wilson Associates

J. G. Harrison Residence, Honolulu
Architect: Alfred Preis, A.I.A.
Engineers: Walter Lum Associates
Contractor: Thomas T. Tanaka

L. H. Whitaker Residence, Honolulu
Architects: Design Associates (Frank Slavsky, architect; L. H. Whitaker, designer)
Contractor: James K. Shimizu
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ARCHITECTURAL RECORD April 1969
OFFICE BUILDING AT NEW PEAK

An all-time record high, more than 20 per cent over 1961, was set by office building construction in 1962, as reflected in contracts reported by F. W. Dodge Corporation, and the first figures available for 1963 show activity continuing at record levels.

Off to a late start in the postwar period, office building was pushed ahead with a great surge between 1952 and 1956, when annual volume more than doubled. Since then, construction has continued at very high levels, climaxd by another sharp increase in the year just ended.

While total demand for offices has kept several steps ahead of the available supply, the factors behind this demand have been changing in character. The recent office building boom resulted from the need to build ahead and behind at the same time. Due to the virtual absence of this kind of construction during the thirties and early forties, firms found their offices bulging at the seams shortly after the end of the war. It was not until the early fifties that a noticeable dent was put into the backlog, but the catching-up process soon gained momentum.

Much of the rapid gain during the middle fifties, and the subsequent high level of office construction maintained since then, stemmed from this postponed demand. But it is also apparent at the same time office building was buoyed by a firm base of rising current demand. Throughout the entire period new need for additional office space continued to develop as the white collar work force expanded, and as space requirements per worker increased.

Since the war's end, employment in finance, insurance and other services—operations requiring white collar workers almost exclusively—has grown considerably faster than in manufacturing. And even within manufacturing white collar work has expanded greatly relative to production work. As a result, office staffs have grown by 40 per cent since 1950—more than double the 19 per cent rise in total employment.

Various tendencies operating to increase office space per worker have also been a sustaining influence. These include a rising proportion of professional and technical people in the labor force (who average more floor space than clerical workers), an increase in the use of office machinery (which itself requires room), and the growing acceptance of such extras as libraries, health departments, reception areas and employee dining rooms.

The dizzy heights reached by office construction in 1962 raise the question of how much longer the market can support current building levels. The answer involves a balance of the following cross currents:

—plus: to date the national market is not overbuilt.
—plus: a continuing demand will come from the need to make room for the growing office work force.
—plus: replacement of the substantial portion of old buildings in the nation's stock of offices will accelerate.
—minus: there are indications that the backlog of demand—responsible for much of the boom—is about satisfied.
—minus: the recent high rate of building in New York City (a substantial part of the national total) was partly the result of a zoning regulation change, and reaction is anticipated in 1964.

The net effect of these factors will bring a fairly sharp decline in office buildings during 1964 and 1965. In the last half of the decade, however, volume will begin to grow again (at about 5 per cent per year), reflecting the long term trends in white collar employment and replacement needs.

Michael B. Ayre, associate economist
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For more data, circle 7 on Inquiry Card

ARCHITECTURAL RECORD April 1963 19
**Construction Cost Indexes**

Presented by Clyde Shute, Director of Statistical Policy, Construction News Div., F. W. Dodge Corp., from data compiled by E. H. Boeckh & Assoc. Inc.

Labor and Materials: U.S. average 1926-1929 = 100

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Cost comparisons, as percentage differences, for any particular type of construction, are possible between localities, or periods of time within the same city, by dividing the difference between the two index numbers by one of them; i.e.: index for city A = 110

index for city B = 95

(both indexes must be for the same type of construction).

Then: costs in A are approximately 16 per cent higher than in B.

\[
\frac{110 - 95}{95} = 0.158
\]

Conversely: costs in B are approximately 14 per cent lower than in A.

\[
\frac{110 - 95}{110} = 0.136
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Cost comparisons cannot be made between different types of construction because the index numbers for each type relate to a different U. S. average for 1926-29.

Material prices and wage rates used in the current indexes make no allowance for payments in excess of published list prices, thus indexes reflect minimum costs and not necessarily actual costs.
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Shown above is Borden Deca-Ring panel on a multi-level parking facility in downtown Miami. Here Deca-Ring provides safety, ventilation, and a touch of luxury in combination with efficient use of materials. The Deca-Ring screens are the only siding used on an otherwise stark concrete slab building. Individual panels of Deca-Ring are outlined with Decor-Plank to give added design emphasis.

The circular Deca-Ring pattern is currently produced with 3½" O.D. rings assembled at 4½" centers. Depths of 3/4" and 1" are available. For more detailed information on Deca-Ring and other Borden Architectural Decor Panels, including Deca-Gril, Deca-Grid, Decor Plank and their many variations and subtypes, write for our new eight-page catalog on Borden Architectural Decor Panels.

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an exclusive styling by AZROCK®
"ARCHITECTURE, I'M FOR IT," YASKO SAYS:
CHALLENGES "ARCHITECTS OF 50 STATES"
TO MAKE ARCHITECTURE OF U. S. BUILDINGS

In his first public address before an architectural audience since taking office, the new chief architect of the Federal Government last month came out for Architecture ("with a capital A") and placed squarely on the architectural profession of the U.S. the responsibility for deciding when a new era in Federal architecture could begin.

Karel Yasko, who was state architect for Wisconsin until he took office in January as the assistant commissioner for design and construction of the Public Buildings Service of the General Services Administration, was speaking at a program on Federal architecture sponsored by the Architectural League of New York on March 14. His fellow panelists included his predecessor, Leonard L. Hunter, now a partner of John Carl Warnecke and Associates, Architects and Planning Consultants, of San Francisco; Frederick Gutheim, author, critic and president of the Washington Center for Metropolitan Studies, Washington, D.C.; and (as moderator and chairman of the evening) Douglas Haskell, editor of Architectural Forum and chairman of the Current Work Committee of the Architectural League.

Yasko's Creed
Mr. Yasko described as "my creed and my banner" the statement of "Guiding Principles for Federal Architecture" contained in the "Report to the President of the Ad Hoc Committee on Federal Office Space" (July 1962, pages 25-26 et seq.) and sent last June by President John F. Kennedy as a directive to all Federal agencies concerned with building construction.

"Within its guidelines," Mr. Yasko asserted, "we are permitted to produce the greatest architecture in the world—if we have the talent."

Every architect who works for GSA, Mr. Yasko said, now gets a copy of the statement—and usually a reading by Mr. Yasko as well. The excerpts Mr. Yasko selected to read:

"The belief that good design is optional, or in some way separate from the question of the provision of office space itself, does not bear scrutiny, and in fact invites the least efficient use of public money. . . ."

"The Federal Government, no less than other public and private organizations concerned with the construction of new buildings, should take advantage of the increasingly fruitful collaboration between architecture and the fine arts. . . ."

"Major emphasis should be placed on the choice of designs that embody the finest contemporary American architectural thought. . . ."

"The development of an official style must be avoided. Design must flow from the architectural profession to Government, not vice versa."
This new addition to the Student Union Building measures 112' x 72'. 20 precast wall panels prestressed at 200 psi form the side walls. They are 8' wide and vary in length. The two longest are 35'. Note Tee section stairs leading to entrance. Louvers shielding entranceway are attached to cantilevered roof and floor Tees.

PRECAST and PRESTRESSED CONCRETE Adds Beauty and Utility to College Student Union

* Prestressed single Tee beams form both the floor and roof of this new addition to Gonzaga University's Student Union in Spokane, Wash.

Precast columns support the beams and add a dramatic frame for pre-stressed wall panels of exposed natural aggregate. An unusual array of giant prestressed louvers add a decorative and protective screen to the main entrance. Even the main stairway is precast concrete—formed by basic sections of a single Tee.

The varied use of concrete in this new structure adds more than a pleasing design that blends easily with the existing architecture. Such all-concrete construction also provides the utmost in fire-resistance. Strength for long service. Freedom from maintenance. And low initial cost.

LEHIGH EARLY STRENGTH CEMENT BENEFITS ALL MEMBERS OF THE TEAM

Central Pre Mix Concrete Co. used Lehigh Early Strength Cement for the precast and prestressed units in this building. Here, as in almost any concrete work, this cement provided important benefits for manufacturer, contractor and architect alike. Quicker re-use of forms. Earlier availability of units. Assured on-time delivery for smoother planning.


Architect: Whitehouse, Price & DeNeff
Associate Architect: Henry J. Swoboda
Engineer: Andy Bingham
General Contractor: Wm. Spilker & Sons
Prestressed & Precast Units: Central Pre Mix Concrete Co., Prestressed Division
Ready Mix Concrete furnished by: Central Pre Mix Concrete Co.

All of Spokane, Washington

Fourteen prestressed single Tee beams form the roof; the same number are used for the floor. Roof Tees are 8' wide; range from 88.2' to 30' in length. Floor Tees are 73' long, 8' wide, 3' deep. The precast supporting columns are 34' high, 3' deep, 8' thick.
Porcelain shattering? Excessive chipping? Forget it! With AllianceWall, you don't have this problem so common with ordinary heavy porcelain panels. Here's why: AllianceWall is made of lighter gauge steel or aluminum, so it has a slimmer coating of porcelain enamel; made to handle more flex or twist than ordinary porcelain. Further, AllianceWall is shock absorbent. It's laminated to a hardboard backing that cushions construction jolts and blows like a sponge, meaning fewer job replacements.

You can see the advantages of using AllianceWall. There's far less construction damage, and greater on-the-job workability, adding up to substantial savings in time and money plus longer life. You can choose from 28 standard porcelain enamel colors (any other color, too, for a small extra charge). Available as either a veneer or insulating panel, and in a variety of sizes, thicknesses and cores. For information write Main Plant and General Offices, AllianceWall Inc., P. O. Box 247, Alliance, Ohio.
And finally, the admonition of Pericles to the Athenians, quoted in the statement: "We do not imitate, for we are a model to others."

Who Makes Architecture

How and when the policy gets translated into Architecture "with a capital A," in Mr. Yasko's view, is up to "the architects of the 50 states," and he had some very forthright advice: "Don't go around blaming that ogre, the Government, for your incompetence or your inadequacy—or perhaps your unwillingness to give the Government the very best you've got... I say the level of architecture throughout the nation, be it private or public, reflects directly the quality of our profession.

"From my recently-gained viewpoint of public life—I'm out of private practice only three and a half years—I've drawn some sharp objective observations: that the profession of architecture in the U.S. can claim only a handful of pros, another little fistful of semi-pros, and the greater number are pedestrians. "The reluctance to come to grips, the unwillingness to study, to explore ideas—many, not just a variation on the original theme—is a common failure. Where is the architect who soaks himself in the project, goes at it with both fists, knocks himself out cold over creation: where is the agony and the ecstasy in architecture today?"

More "Crits" Needed?

Mr. Yasko also decried what he saw as a current tendency toward making architecture merely a channel for self-expression. "Modesty is a precious word and a modest architectural statement is so precious you can rarely find it." He cited as one of the rare examples of "talent without assertiveness" the Lafayette Square project in Washington, D.C. (John Carl Warnecke is the architect.)

Finally, he thought that what architects needed was not more freedom in designing public buildings—they have had that, he said—but more criticism; and he said his office would be prepared to provide any number of "crits" at every stage of any project, whenever an architect asked.

What Experience Taught

Mr. Hunter, who in his eight years as assistant commissioner for design and construction managed a quiet revolution in Federal architectural attitudes without any Presidential banner to wave, had some quite specific principles to offer.

Like Mr. Yasko, Mr. Hunter felt that President Kennedy's endorsement of what Mr. Hunter also regarded as a most enlightened statement on Federal architectural policy was a "most important" step toward a higher level of Federal Architecture.

How should this directive be implemented, Mr. Hunter asked? And he answered his own question with 10 suggestions based on his own 28-year experience as an architect with the Federal Government. Mr. Hunter's 10 points:

1. GSA should divorce itself completely from outside influence in the selection of architects.
2. The GSA committee which reviews the qualifications of architects and recommends selections for specific projects should be expanded to include three architects from private practice.
3. All appropriations for new Federal buildings in Washington should be made to GSA.
4. Any architect selected for a project in "X" community should be required to associate with an architect "of design ability" when necessary.
5. The very first schematic submission of drawings required by GSA should be expanded to show more of the design concept.
6. A method should be set up in GSA to obtain and retain funds for fine arts in Federal buildings.
7. Control of the design organization in GSA should be returned to the professional architect or engineer; the Commissioner of Public Buildings should always be a top-flight architect or engineer.
8. Membership of the National Capital Planning Commission should be reconstituted so that a majority of its seven members are required to be professional planners.
9. Method of selection of Fine Arts Commission should be revised to let the appropriate professional societies offer nominations from which presidential appointees could be selected.
10. Design of Federal buildings should not be legislated but should be the outgrowth of environs, site and program.

The Public as Client

Promotion of professionalism in public service and recognition by private architects that public architecture demands extraordinary effort on their part were two of the important points made in the evening's opening address by Mr. Gutheim.

Introducing the theme which became a recurring one in the later talks, Mr. Gutheim said the problem as he saw it involved the private architects first of all. Are their expectations naive, he asked? Are they adequate to this kind of practice? Are they willing to accept it as involving special qualifications and endeavors, and to specially prepare themselves for it as they would, say, for hospital design? How can architects overcome their inexperience in public affairs, in working with public clients who have large-scale and complex operations?

On the government side, Mr. Gutheim suggested perhaps the most important difficulty is the public, whose taste and demands are reflected in the political process. How can they be educated, made to look ahead, brought to higher levels of cultivation and thus become better clients? In the relationship between the architect and his immediate client, the government, Mr. Gutheim asserted that efforts by the government alone cannot produce the desired results—the architects themselves, the architectural press, the building product manufacturers must all contribute to a solution.

Some guidelines for moving ahead offered by Mr. Gutheim:

1. Select only the best architects for public work—competitions are sometimes the answer; advisory panels of distinguished private architects like the panel so successfully used in the State Department's foreign buildings program ought to be considered.
2. Simplify and improve the relationship of the private architect with the Federal agency, and make it a stimulating encounter.
3. Provide technical support, better programs and especially more high-level staff architects, not to do design but to collaborate as "architectural clients." We need to value and respect the public staff architect, a new breed, the closest to a warm, live "client" in the Federal building process.
A soaring arch of Plexiglas admits natural light into wall areas of the Marin County Civic Center building. Frank Lloyd Wright, Architect; Taliesin Associated Architects of the Frank Lloyd Wright Foundation; William Wesley Peters, Chief Architect; Aaron G. Green, AIA, Architect Associated.

The 384-foot skylight is Plexiglas

Frank Lloyd Wright designed this skylight. PLEXIGLAS® acrylic plastic gave it form and substance. It is one of the distinguished features of a famed new structure, the Administration Building of the Marin County Civic Center, near San Rafael, California. The skylight is 384 feet long, 20 feet wide.

Each curved span consists of three large sheets of transparent PLEXIGLAS, supported by ribs made of channelled aluminum. The PLEXIGLAS is only one-quarter inch thick. It provides the required combination of strength, weather resistance, crystal clarity, and light weight. We will be pleased to send you detailed information on the use of PLEXIGLAS for continuous-arch skylights and other architectural applications.

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SPEED is imperative in responding to emergencies. Heavy steel "OVERHEAD DOORS" on Fire and Crash Building rise in 9 seconds automatically, at the touch of a button from main control tower.

RELIABILITY is key factor in all maintenance facilities required to keep the airport mobile. Special 19-ft. "OVERHEAD DOORS" deliver day-in, day-out dependability in Main Terminal Building.

AUTOMATIC CONCEPT of new "AUTO-MATE" door operators, engineered to meet jet-age requirements, provides the flexibility and control the architect sought throughout his design.
FLEXIBILITY OF THE "OVERHEAD DOOR"

At Dulles Airport, "Traffic" means much more than just people and planes. Traffic means a constant flow of air cargo and the ground vehicles to handle it. Traffic means a sizeable task force of fire and crash equipment and the maintenance crews to keep it "at the ready."

To solve these and many other problems in traffic flow, the architects called on the engineering experience and production facilities of Overhead Door Corp. Their confidence was well placed, judging by results. Already installed: 115 doors, 104 of them equipped with "Auto-Mate" automatic operators, with more on order. Now, traffic flows smoothly, quickly, flexibly, with The "OVERHEAD DOOR." Installed side-by-side, and equipped with "Auto-Mate" automatic operators, these doors become a movable wall. Opened as a group, they can give total access to an area. Opened individually, they can direct the flow of traffic, prevent pile-ups.

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For more data, circle 14 on Inquiry Card
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There's no limit to Skydome combinations and applications. A ring of bright sunshine around a cafeteria. A diamond over a lobby. A shining star in an auditorium. It's geometric poetry. Yet it's practical. Because like all Skydome units, these models permit fuller use of floor and wall space, make work areas brighter, and trim electricity bills.

Design . . . with sunshine. When you use famous Skydome skylights, the sky's the limit.

For complete specifications, see Sweet's Architectural File 20a/Am or Sweet's Industrial Construction File 15c/Am . . or write Cyanamid.
COMMITTEE PLANS
RESTORATION OF
ROBIE HOUSE

The restoration of Frank Lloyd Wright's famed Robie House in Chicago is the aim of an international campaign to raise a needed $250,000. At the campaign's launching in February, William Zeckendorf Sr., board chairman of Webb & Knapp Inc., presented the deed to the house to Dr. George W. Beadle, president of the University of Chicago. Mr. Zeckendorf spoke of the "imperishable value" of the house as a work of art and an object of beauty. Dr. Beadle said the university will maintain the house in perpetuity, but that its funds may not be spent for architectural restoration. The university will use and maintain the house for educational purposes.

Robie House, built in 1909 and perhaps the most famous example of Wright's Prairie Houses, was designated an irreplaceable landmark by the Commission on Chicago Architectural Landmarks in 1957. That same year, after plans were announced for the razing of the house, Webb & Knapp purchased the building for use as its construction headquarters. In its series, "100 Years of Significant Building" published in 1956-57, Architectural Record saw Robie House as tying for first place in the category of houses.

Ira S. Bach, Chicago city planning commissioner, is chairman of the Robie House Committee, composed of over 100 architects, architectural authorities and persons interested in preserving this landmark.

In an appraisal of Robie House, August Heckscher, special White House consultant on the arts, said: "The creation of contemporary works of lasting merit, now and in the future, is not possible if we fail to preserve with a certain love and piety the high points of our past achievements. Those who are working to save Robie House are doing a real service to architecture. . . ."
Why the pioneer in sound-control is your ablest helper today

▲ In the 20th century, sound control is your responsibility. When quiet happens in modern buildings, it is made to happen...and the process begins at the drafting-table.

▲ In the drafting stage, there are 361 good reasons why you should draw on the resources of Acousti-Celotex products—from the pioneer in modern sound control. 360 of them are beautiful! 360 variations—in design, texture, base-material, size, shape, construction type and fire-ratings—all designed to please the eye as well as soothe the ear. These 360 variations in Acousti-Celotex products give you the widest range of precision-engineered materials to work with in esthetic sound-control!

▲ The 361st reason is a comfort to many a harassed architect. This is the huge body of experience—the lengthiest and most varied in the field—that the Celotex Corporation and Acousti-Celotex distributors have built up in solving acoustical-esthetic ceiling problems. This experience is yours for the asking. For free ceiling consultation service, specifications, samples, find your Acousti-Celotex distributor in the Yellow Pages—then call him.

ACOUSTI-CELOTEX PRODUCTS

Problem-solver in esthetic sound-control!
The Problem: Keep unwanted sound out
The Solution: Acousta-Pane®
The Producer: Amerada Glass Corporation

The development of Acousta-Pane has...for the first time...provided the architect with a glass which efficiently isolates sound.

Acousta-Pane can be utilized effectively for both interior partitioning to achieve acoustical privacy, as well as for exterior walls which will control transmission of outside noises. No other glass equals the sound isolation properties of Acousta-Pane.

Acousta-Pane standard thicknesses...\( \frac{3}{8} \)" to \( \frac{5}{8} \)"...require no special installation or handling. It is shatter-resistant and may be obtained in clear or with amber tint. Acousta-Pane has broadened both the functional and esthetic utilization of glass. Its economy and practicability further commend Acousta-Pane to the architect's interest in the design of modern buildings. AMERADA GLASS CORP., 3301 S. Prairie Ave., Chicago 16, Ill.

Acousta-Pane is especially effective in the critical frequency range for speech and normal office sounds—from 500 cps to 4000 cps—where ordinary glass is relatively "transparent" to sound.

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* See Sweet's 1963 Catalog, Section 7a
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A single comment by one contractor on the building of this new science center tells the story: "Republic products were delivered on time."

On time means on schedule, too — and all the Republic products shown were delivered in coordination with construction schedules: the kind of delivery that in today's cost climate can mean the difference between a fair profit and an unreasonable loss.

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to know that your DuKane Franchised Distributor can provide you with a total communications system designed to meet your specific needs.

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To the right are a few of the many DuKane communications systems.
When you specify CV DURATHIN you get utmost economy without sacrificing quality or color

Thinness, light weight and large size units make 3/8" CV Durathin less costly to buy and install than other materials of comparable quality. Maintenance is minimized too, by CV Durathin’s ceramic finish which resists dirt and grime. You have a spectrum-rivaling range of solid or mottled colors from which to choose ... for smooth surfaces, or sculptured patterns in the Design Series. Use CV Durathin to give the budget buildings you design the architectural expression you desire. Consult Section 13d/Fe in Sweet’s, or write for complete data.

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No matter what you specify for the outside or inside walls, Styrofoam FR brand insulation board goes perfectly in between. Because it stays dry, Styrofoam FR keeps its low "k" factor permanently. And it's so versatile:

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H&K PERFORATED METAL GRILLES
(Send for Grille Catalog)

Harrington & King has been serving architects for 75 years with a wide selection of classic and modern designs in grilles and decorative materials. H&K grilles are furnished in accordance with your specifications... in practically any type and gauge of metal... and in the finish desired. Perforations are clean and burr-free, margins are in alignment, and each grille is leveled and inspected before shipment.

H&K decorative patterns, from a vast selection of existing dies, are serving architects in many new and unusual ways. If your plans call for perforated materials, depend on H&K!

See Sweet's File—30f/H

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RC SAFETY DESIGNED

MUSSON PERFORATED RUBBER MATS

Inlaid or Plain
Feature safety, quality and beauty for entries, lobbies, vestibules. Mussen Mats are made in all sizes and shapes. Easy to clean and handle. Name or design can be inlaid in mat, in colors. Prompt delivery.

PYRAMID surface design in heavy, "thin" rubber gives safest, best looking, easiest of cleaning.
PERFORATIONS: Newest design. Skid resistant, will not catch, slip, up to 12" x 14", in one piece, Thompson solid surface and drainage under mats.
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Mussen makes trends of the toughest, heaviest gauge and weight molded rubber. They are designed for safety, beauty and durability. Try them!

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Neat!

Why put up with a clumsy-looking water chiller? The new Chrysler Airtemp line of 20-100 HP packaged chillers now gives rugged reliability a sleek, new look!

Contrast the elegant, modern design of this 100 HP chiller with the usual maze of pipes, iron, sheet metal and gauges. Appearance is important, of course, but make no mistake about it — these new chillers will give you the same outstanding performance you've always associated with Chrysler Airtemp's line.

The new chillers also answer all the other major problems you once had to deal with. They are quiet — the only single compressor units of over 20 HP with a sound cabinet, permitting installation in quiet areas. They are compact — even the 100 HP unit will go through a 35" by 6'8" opening, which means the unit can often be taken to the roof right in the elevator.

Other important features include a very precise and simple electric unloader (Chrysler originated individual cylinder unloading) . . . and easy accessibility (all controls can be reached from a removable 4' x 4' front panel.)

The new design translates useless pounds of structural steel into "mechanical muscle" for longer life and trouble-free service. You can find out more about this revolutionary new line by writing to Chrysler Corporation, Airtemp Division, Dept. C-64, Box 1037, Dayton 1, Ohio.
PARKING FOR 1000-1200 CARS
IN POST-TENSIONED STRUCTURE

Heating and Cooling Equipment for 44-Story Building Carried on Top Level

When architects Welton Becket & Associates, and engineers Stacey & Skinner designed the parking garage for the new 44-story Humble Oil and Refining Office Building, Houston, post-tensioned prestressed concrete construction was specified. The contractor selected the Prescon System. This type of construction provided greater versatility in the utilization of parking space. Headroom was not decreased by beams as openings were formed in them, and the appearance of tees and slabs was clean. A bank and service station occupy a portion of the ground level.

Construction is of pretensioned beams, 63' long and spaced 28' apart, post-tensioned in place after the slab load was on them. The slab (71/2" thick—9" for top level) is post-tensioned using coupled tendons totaling 252 feet. The two circular ramps (behind extension screen at center and right corner of photo) are post-tensioned cantilevers 17'. At no point does the ramp structure tie to or touch the parking level slabs.

Prescon representatives can show you applications of the Prescon System of post-tensioning prestressed concrete in poured-in-place, lift-slab, and precast construction in many types of structures. Write for brochure showing numerous buildings and listing almost 200 others which used the Prescon System.

NEW 3 COLOR BROCHURE ON PARKING GARAGES READY—WRITE FOR YOUR COPY.

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INDIVIDUAL ARTISTRY HAS ITS PLACE IN MAKING GLASS...
Is The Only Medium Heat Appliance

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INSPECTED
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THAT'S U. L. LISTED

Whatever the installation — incinerator, boiler or furnace — cut your costs safely with a U.L. listed Van-Packer Model H-T stack.

Made of special refractory material, Van-Packer averages 3 times longer life than a steel stack. A Van-Packer costs no more than a comparable steel stack — less than brick or tile-lined concrete block stacks.

For incinerators, boilers or furnaces with a range of 8 diameters from 10" to 36", Van-Packer offers the safety, performance, and economy you require.

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For complete engineering and application data, write for Bulletin IS-57.

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MANUFACTURED
TO your SPECIFICATIONS

American Fixture Inc. has the experience and manufacturing versatility required to produce the many merchandising fixtures so necessary to a modern department store's efficient and successful operation...

METAL FABRICATION and FINISHING including ELECTRO-PLATED FINISHES and HIGH-TEMPERATURE oven-baked EPOXY COLOR ENAMEL FINISHES • WOODWORKING and CABINET MAKING... over fifty years experience in producing fine quality wood fixtures, showcases, etc. for America's leading retail stores • PLASTIC LAMINATING... wood grains and colors to your specifications.

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Whether your plans are for a complete store or a remodeling project... LET US BID YOUR JOBS!

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Doors are to close...
Kahn


This book is confirmation of what appears to be a trend to large-format volumes of well reproduced drawings. Mr. Kahn is adept with pen, pencil and crayon, whether he is applying them to conceptual drawings, finished perspectives or travel sketches. Oddly, it is the travel sketches which seem to reflect best the architect's mind at work, as in the four drawings of the cathedral at Albi; impressions of structure, purpose, bulk and texture, are quite clearly evidenced. Of Mr. Kahn's own designs, probably the six drawings of the Medical Building are the most illuminating, progressing as they do from early sketches to a late definitive study. Part of this illumination undoubtedly lies in the reader's prior knowledge of the building and the reasoning behind its design. Which fact indicates the book's greatest disappointment—it's paucity of factual information.

None of the drawings—thank heaven!—are the pretty pictures produced for the layman-client. But even the architect—studying a conceptual city plan, for instance—needs some idea of the problems to be met and the solutions derived. Without such an idea, he runs the danger of perceiving architectural drawings as a shallow esthetic pleasure in pattern and technique.

Nonetheless, most of the drawings are informative, the entire book is handsome, and the whole is amplified by selected writings of Mr. Kahn.

Giedion


Subtitling his book, "A Contribution on Constancy and Change," Mr. Giedion has begun (this is the first volume of his study) to compare and assess the discoveries made about prehistoric art during the past 50 years and the developments in contemporary art through the same period. This is not to suggest anything as simple as an examination of the derivation of modern techniques from admiring of cave paintings. (Prehistoric art, for the purposes of this study, is confined to European cave art.) Rather it is an effort to get behind the surface brilliance of prehistoric depictions of animals to find the essential concepts which governed the expression, and to find what relevance those concepts may have for modern life and modern art.

By far the largest part of the book, in terms of bulk, is devoted to symbolization. Most architects will probably be more interested in the sections on prehistoric space concepts. Mr. Giedion takes issue with the view that prehistoric man carved and painted in a primitive attempt to establish order or to assert his humanity in the face of overwhelming and terrifying chaos. Primeval man, he maintains, did not see himself as a creature apart, nor did he recognize space as a quantity which could be divided and controlled. As time was conceived as "the eternal present," space was conceived without distance and without direction. Art was, in short, pre-architectural: modern man's recognition of space relationships in the caves results largely from his experience of architecture. The subject of man's attempted dominion over space through architecture is promised for a second volume, "The Beginnings of Architecture."

Illustrations include 351 half tones and 20 color plates.

Churches

TOWARDS A CHURCH ARCHITECTURE. Edited by Peter Hammond. The Architectural Press. 9-13 Queen Anne's Gate, London S.W. 1. 362 pp., illus. 30s.

This is a collection of papers read over a period of years to Britain's...
Here's a door closer so compact you can put it in the door instead of on it! Doors look better . . . so do your interiors. Even where you must have surface-closer installations, you can get the Top-Railer® with attractive covers that conceal the closer mechanism. Either way, your clients get complete door control. Separate adjustments regulate closing speed, latching, and back-check. High-strength construction throughout. See your Russwin supplier. Or write for literature to Russell & Erwin Division, The American Hardware Corporation, New Britain, Conn.

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Three new diazo intermediates which fit their performance directly to your reproduction requirements are now available from Ozalid! They require no special equipment or processing and can be exposed on any Ozalid whiteprinter or similar machines.

**Unmatched pencil-line pick-up power**

The standard (402 ITX) and faster (404 ITX) intermediates reproduce faintest details faithfully. Their "pencil-line pick-up power"—the true measure of a good intermediate—is rated excellent by research and development technicians and by industry experts.

**Improved 402 ITX**—the standard intermediate in the new line, has greatest density and assures maximum readability in the final print.

**All-new 404 ITX** is a distinct improvement over other sepias and combines fast printing speed with high quality reprints. Its broad covering power results in sharpest images. The new 100% rag, transparentized and blue-tinted base gives faster printback speeds. 404 ITX narrows the gap between printing and reprint speeds; in many cases both speeds are identical.

**Fastest intermediate you can get!**

406 ITX—another new Ozalid intermediate, is twice as fast as 402 ITX. Density is a trifle less, but the remarkable increases in production, over 100%, offset its slight decrease in covering power.

**New, easy-on-the-eyes, readability**

The rich mahogany image color of the new ITX series contrasts sharply with the blue-tinted background, providing excellent visual acuity and exceptional readability.

Which to use? 402? 404? or 406?

402 ITX—because of its superior covering power—is of great value to architects, engineers and draftsmen who demand exceptional repro fidelity as well as good printback speed.

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**Corrections are simple**

Dye line eradications can be made quickly and easily with Ozalid Intermediate Corrector. Special base stock readily accepts pencil and ink additions.

**Repeated erasures don't ghost or lose "tooth"**

The ITX product line has a 100% rag-tracing vellum stock as a base with a new plastic transparentizer. Even repeated erasures made on the same spot do not destroy the "tooth" or ghost in printbacks.

**Get all the facts now!**

For complete information about this new family of intermediates, write OZALID, Dept. 142 Binghamton, New York.
Pave any project in color with new **Viadon®** and **Miradon®**

Now you can specify color wherever you specify paving—red, green, blue, yellow-gold and white. New Viadon and Miradon are unit-packed for economy on small jobs. They're heat- and fuel-resistant and provide superior strength for the heaviest loads. The color is part of the mix—*lasting* color with which you can create more attractive parking and recreation areas... safer floors, streets and highways... more elegant patios, pools and driveways. New Viadon and Miradon can be mixed in standard asphalt plants and laid with existing equipment. For a detailed brochure, write to our Asphalt Sales Department in Houston, Texas.

**IT PAYS TO DO BUSINESS WITH HUMBLE... AMERICA'S LEADING ENERGY COMPANY**
NEEDED FOR YEARS...to prevent perplexing predicaments in the bathroom...AND HERE IT IS

A NEW BATHROOM CONVENIENCE Just a cover-opening away is the spare...insurance against embarrassment. Closed it's one of the most attractive accessories a modern bathroom can have. Beautifully chromed and precisely made in every detail, it combines a new and original idea with Hall-Mack's fine styling.
The smoothly operating door which conceals the extra roll is a sparkling, chrome plated brass panel—compact and flush with the wall—that blends pleasingly with any decor.
For new homes or remodeling, you're sure to make friends and influence new customers when you specify, sell or install built-in features by Hall-Mack—especially Conceal-A-Roll with the "spare" compartment that solves a delicate problem.

Required Reading
continued from page 52

New Churches Research Group by architects and churchmen. The contributors are drawn from Roman Catholics, Anglicans and Protestant denominations.
Without exception, each urges liturgical reform and corresponding architectural reform. The argument—for greater community in worship, for an elimination of vestigial medievalism, and for architectural programs based on a reassessment of liturgical function—was described by Peter Hammond in “Liturgy and Architecture” (see Required Reading, April 1962).
Each of these writers also takes for granted the interlocking effects of liturgical and architectural reform. If a clearer idea of liturgical requirements is basic to a meaningful architectural expression of Christianity, so architecture, by providing churches which serve worshippers in communion rather than spectators in awe, may shape a more meaningful approach to liturgy. This interdependence is viewed from the vantages of theology, history, symbolism, sociology, even technology.
In light of liturgical changes which may quite possibly reemerge out of the current ecumenical council, and in light of growing Protestant interest in re-examining liturgy and church architecture, these papers are must reading for architects involved in church design, as well as for church building committees.

Monographs


One of the difficulties scholars face when writing popular studies of exotic architecture is that their readers may range from the totally ignorant to the barely familiar. In earlier volumes in this series, covering the great ages of Western architecture, au...
FOR BUILDINGS WORTHY OF INTERNATIONAL RECOGNITION

Ever increasing costs in school construction, and the nation's dire need for rapidly-constructed, durable and economical facilities that are still aesthetically beautiful, have caused architects and school boards across America to turn to Mo-Sai.

Schools, such as the Skyline High School in Salt Lake City, winner of an International Educational Buildings Conference award, are now quickly erected in time to meet new population explosions.

Skyline High is enclosed by 1,300 precast and preinsulated Mo-Sai panels of exposed aggregates in white or blue matrices. Panels, 5'x10' and larger, were easily bolted to the building's structural frame.

On the classroom block, these panels may be unbolted again to extend the building even further as the need arises and without undue additional cost.
A personal offer to principals of America's 6500 leading architectural firms

This week in your office mail, you'll be offered a new Imperial for private evaluation.

You'll find it a surprisingly different fine car. It's designed for unequalled spaciousness, even to the clearances behind and below the steering wheel. And you'll see unaccustomed luxuries as standard equipment: power windows, hidden storage compartments, an automatic parking brake release, an inside control for the outside mirror.

But Imperial's most startling difference is in the driving. One really must experience its road balance and maneuverability and response to appreciate its reputation as the supreme road car of its field.

It is precisely for such reasons that we challenge you to make your own judgment of the one luxury car warranted* for 5 years or 50,000 miles. Just call your Imperial dealer, and he'll reserve a car for you.

*Your authorized Imperial Dealer's Warranty against defects in material and workmanship on 1963 cars has been expanded to include parts replacement or repairs, without charge for required parts or labor, for 5 years or 50,000 miles, whichever comes first, on the engine block, head and internal parts; transmission case and internal parts; torque converter, drive shaft, universal joints (excluding dust covers), rear axle and differential, and rear wheel bearings, provided the vehicle has been serviced at reasonable intervals according to the Imperial Certified Car Care schedules.
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ARCH ITECTURAL RECORD

A p ril 1963

59


Beneath its glamorous exterior hums one of the most efficient energy systems in operation today... providing power for electricity, heating and cooling... entirely from economical natural gas.

Not a single utility line mars the Broadwater's scenic, 33-acre Gulf Coast tract.

All of the power for the 316-room hotel's facilities comes from three Caterpillar G398 Natural Gas Engines with 500 KW electric generators. They provide low-cost steam for heating—and for cooling with absorption refrigerating units.

Heat radiation from the engines is recovered by an efficient cooling system to warm the building in the winter, cool it in the summer. It also provides abundant hot water all year round. Thermal efficiency during the winter months exceeds 80%.

Natural gas costs 35 cents per 1000 cubic feet in the Biloxi, Miss., area—yet compared to commercial electrical power at 1.4 cents per KWH—total power savings average $4000 a month. The hotel's investment for power-generation and heat-recovery equipment will be fully amortized in five years. From that point on, the hotel's only energy expenses will be natural gas and the low operating costs of the Caterpillar-powered system.

Have you investigated the total energy concept with natural gas? Right now efficient systems are working in apartment buildings, hotels, motels, shopping centers, department stores, hospitals, office buildings, banks, and manufacturing plants.

The men to see for further information—including helpful design counsel—are the power-generation specialists at your Caterpillar Dealer.

This year the Broadwater Beach Hotel will save $48,000 in total energy costs


For more data, circle 31 on Inquiry Card
Now...you can design for light weight with high-strength 200-Series Stainless Steels!

200-Series stainless steels make your product light by providing great strength in thin gages. This is because their yield strength in the annealed condition is 40% higher than corresponding 300-Series (18-8) stainless steels—already known for high strength-to-weight ratios. Moreover, the 200's save on material costs since less metal does the same job.

Also, fabricability and corrosion resistance of the 200's are excellent...in general equal to the 300's. For full data on properties and uses, write for the new booklet, "200-Series Chromium-Nickel-Manganese Stainless Steels." Union Carbide Metals Company, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, New York.

"Union Carbide" is a registered trade mark of Union Carbide Corporation.
Tested by a nationally recognized laboratory under ASTM procedure — designation E-152-58 — STANDARD Fenestra steel doors and frames withstood the fire endurance test for 1\(\frac{1}{2}\) hours.

Fenestra's Full Flush CERTIFIED Doors are welded in more than 200 places to a rugged multi-ribbed inner frame. These new doors, with their built-in safety features, can be used throughout any building. More fire resistance can be provided for schools, apartments, nursing homes, homes for the elderly, public housing, without increasing the cost.

<table>
<thead>
<tr>
<th>Door Type</th>
<th>Fire Resistance</th>
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<tbody>
<tr>
<td>18-Gauge 1(\frac{3}{4})&quot; doors</td>
<td>resist fire up to 1(\frac{1}{2}) hours.</td>
</tr>
<tr>
<td>20-Gauge 1(\frac{1}{4})&quot; doors, in heights of 7' 0&quot; and 7' 2&quot;</td>
<td>will resist fire up to 1(\frac{1}{2}) hours.</td>
</tr>
<tr>
<td>20-Gauge 1(\frac{3}{4})&quot; doors, 6' 8&quot; high</td>
<td>will resist fire up to 45 minutes.</td>
</tr>
<tr>
<td>16-Gauge 1(\frac{3}{4})&quot; frames and 18-Gauge 1(\frac{1}{4})&quot; frames</td>
<td>will resist fire up to 1(\frac{1}{2}) hours.</td>
</tr>
</tbody>
</table>

Fenestra CERTIFIED doors and frames are standard and available from your Fenestra distributor — no premium price — no delays in delivery.

Look for your Fenestra distributor in the Yellow Pages. He will furnish complete information. Or write Fenestra Incorporated, Door Division, Erie, Pa.
Specially designed with close-clinching threads, special tapered point and standard ⅜" hex head, this new fastener is used for: 1. Fastening sheet side laps. 2. Attaching sheets to light gage structural framing. 3. Fastening flashing to sheets. 4. As plugs, where smaller diameter fasteners have failed.

Performance Features . . .

- Tighter Laps—Prevents Leakage
- Stronger—Less Stripping-Out
- Lowers Overall Erection Costs

Write for complete data, samples and prices.

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Townsend Company
ESTABLISHED 1816 • BEAVER FALLS, PA. • A TEKTRON COMPANY

Plants in West Newton, Pa., and Santa Ana, California

For more data, circle 34 on Inquiry Card

Required Reading
continued from page 56

thors could count on the reader's visual familiarity and cultural sympathy.

Mr. Alex, writing on Japanese architecture, had an advantage in being able to assume that his readers had some familiarity with this field. In a straightforward chronicle, he has shown sense and discrimination in citing comparatively few buildings for each period. This discrimination yields an added benefit: space enough for a number of illustrations of the more important buildings, e.g., the shrine at Ise, the Todaiji Daibutsuden, and Katsura Palace.

With the exception of tourists who have prepared themselves, most North Americans probably know less about Central and South American architecture of the Pre-Columbian period than about that of almost any other period or region. Mr. Robertson has not been too proud to adopt the journalist's axiom, "Never overestimate the reader's knowledge, never underestimate his intelligence." He has written an informative introduction to Pre-Columbian architecture both as architecture and as archaeology.

Chinese and Indian architecture is obviously an enormous subject. Attacking it with a sense of the limited space available to him, Mr. Wu has given a broad definition of resemblances between Chinese and Indian architecture in conjunction with their respective religions and cultures. His final chapter is an appreciation of the Chinese garden; unlike most Chinese architecture, which was socially oriented, the garden, as Mr. Wu sees it, is a free expression of the individual's relation to the universe.

Islamic architecture is a subject perhaps even more unknown and incomprehended by Westerners than Asian or Pre-Columbian architecture. Under this burden, Mr. Hoag's effort to produce a monograph consistent with serious scholarship is valiant; but the ordinary reader, struggling under his own burden of ignorance, might wish a more basic presentation.

The illustrations in all the volumes are numerous, well reproduced, and enlightening, alone or in company with the text. The volumes are designed to match earlier editions in the series.
NIAGARA POWER PROJECT
LOCKS and BUILDERS' HARDWARE
by
Lockwood

The nearly completed Niagara Power Project, one of the world's largest hydroelectric generating plants, is western New York State's most important source of electricity. Capable of generating enough current (1,950,000 kw) to supply the electrical needs of an entire city the size of Chicago, Niagara Power's continuous operating dependability was a paramount consideration.

Proposed equipment for the $177,170,000 plant was critically examined. Every phase of this project demanded the utmost in quality — when it came to locks and builders' hardware, Lockwood was used.

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Lockwood Hardware Manufacturing Company, Fitchburg, Mass.

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Glass relates indoors to outdoors...

Transition between modern building and rustic site (above) is softened by gentle curve of walls and subtle tint of the windows. Rib effect created by adjoining window frames gives vertical texture to walls, offsets emphatic horizontal spandrel lines.

Mass and substance (left above) are created by precast concave spandrel panels combined with windows of tinted transparent glass and panels of opaque colored glass. Window frames are extruded aluminum porcelainized off-white and articulated from each other and spandrel panels by bands of bronze-colored duranodic aluminum.

Sweeping vistas are made possible by narrow building plan, which places every office within view of the outdoors. Curved terrace is light-tan colored brick.
building to site...in an office in the country

A clean-lined, efficient office building to house 1400 employees of a major corporation. A rolling, wooded, 180-acre site. Wed the two. This was the problem faced by Architect Vincent G. Kling, FAIA, in designing new headquarters for American Cyanamid Company in Wayne, New Jersey.

An important part of Kling's solution was 23,000 square feet of ASG's smoked topaz plate glass, one of several building materials carefully chosen to soften the transition between modern building and rustic setting. From outside, the color of the plate glass blends with the surrounding woodland tones while its highly polished surface reflects the changing colors of the seasons and shifting patterns of cloud and sky. Inside, the glass transmits the true colors of the landscape and reduces solar heat and glare.

Architect Kling's dramatic and skillful use of plate glass is typical of the creative solutions available to architects in the broad range of glasses from ASG — the only U. S. producer of all major types of flat glass. Whatever your glass requirements, ASG's Starlux plate, Lustra-line sheet or Blue Ridge patterned glass will meet them. All the more reason for thinking ASG whenever you think glass.

For more information, see your local glass distributor or ASG representative, or write: Dept. D-4, American-Saint Gobain Corporation, Box 929, Kingsport, Tennessee.
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Standard Conveyor COMPANY
312-D Second St., North St. Paul 9, Minn., Telephone: SPring 7-1355
For more data, circle 37 on Inquiry Card

CHURCH INSTITUTE IS PLANNED FOR ARCHITECTS

The Carnegie Institute of Technology, Department of Architecture, and the Pittsburgh Theological Seminary are jointly sponsoring an Institute of Church Design, to be held in Pittsburgh, June 3-14. The venture was conceived in the belief “that the serious church architect should be thoroughly conversant with present-day developments in those theological disciplines which will have a formative influence on church design . . . in the years ahead. Thus his creative work can flow from his own understanding rather than being dependent solely upon the views of building committees or pastors.”

The Institute, which limits its enrollment to 25 architects interested in church design and who have demonstrated competence in the field, will offer lecture and seminar courses and workshops. Participating will be faculty members of Pittsburgh Theological Seminary; church architect Edward A. Sovik; Howard Saalman, architectural historian, and engineer James P. Romualdi, from Carnegie Tech.

Special feature will be informal group visits with architects Louis I. Kahn, Paul Schweikher and John Johansen.

The cost of the Institute, including registration, room, board and a weekend tour, is $200. For information, write Institute of Church Design, 616 North Highland Ave., Pittsburgh 6, Pa.
This is RUSCO's 20 year warranty! There's little chance of your ever needing it... because the windows it guarantees have proven so trouble and maintenance-free in over 20,000,000 installations. This performance record results from over 25 years of engineering know-how... RUSCO's triple protected steel... and 19 colors that won't chip, crack, peel, blister or fade. Challenge us to prove the superiority of RUSCO STEEL WINDOWS IN COLOR

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UNDERGRADUATES WIN ENGINEERING AWARDS

Fifty-five students in 22 universities and colleges throughout the United States participated in awards totalling $10,000 in the 14th annual Arc Welding Design Award Program for Undergraduate Engineers. Sponsored by the James F. Lincoln Arc Welding Foundation, Cleveland, the competition is held in the interests of advancing the design of arc welded structures and machines.

The jury consisted of Dr. E. E. Dreese, chairman, head, Department of Electrical Engineering, Ohio State University; Adrian R. Legault, head, Department of Civil Engineering, University of Nebraska; Edward Q. Moulton, assistant dean, Graduate School, Ohio State University; and Ralph M. Watson, associate dean, College of Engineering, Syracuse University.

First prize of $1,500 in the structures division was awarded Owen Francis Brown, Columbia University; $750 second award went to Bernard Jokiel, University of Alaska; $500 third award, to Paul D. Smith, University of Akron.

In the machinery division, $1,500 first award went to Richard B. Gwin and John W. Slemmons, Ohio State University; $950 second award, to Norman Abler, University of Wisconsin; $500 third award, to Harold L. Culp and James E. Necessary, Arkansas University.

Designs included bridges, roofs, steel cabins, shelters, cranes, sawmills—even an ocean floor corer.

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Next to school shoes, school steps and corridors take the hardest abuse.

That's why safety and budget-conscious officials insist on Melflex step treads and flooring products. For new construction or replacement, they're unbeaten underfoot for safety, quiet, easy cleaning and long wear. Let us send you a useful catalog.

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improve appearance—increase efficiency

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From a fountain of concrete shells...inspiring church design

From the lantern-like tower that floods the main altar with natural light, concrete parabolas spill out in widening rings. The second tier forms a clerestory. In the lower cluster, the arches shelter monastic side altars.

On the interior of this new chapel of the Benedictine Priory, near St. Louis, Missouri, twenty parabolas echo the architectural theme. They rise from the floor to converge at the base of the tower.

Only shell concrete, with its fluid look, could bring such ease grace and modern simplicity to this circular plan which is basically one of the most ancient used for churches.

The best ideas are more exciting in concrete


PORTLAND CEMENT ASSOCIATION
A national organization to improve and extend the uses of concrete
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For the first time, solid natural walnut trim brightens recessed installations. In one move, you can customize new and relighting projects with a modern decorator look.

For professional offices, restaurants, stores and residences, the hand-polished beauty of this natural walnut adds a luxury look far beyond its modest cost. Smart and stylish, it's as practical as it is handsome. Available in 100-, 150- and 300-watt squares.

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We have rounds, squares, rectangles—ellipsoidals, multipliers—parabolics, baffles and louvered. Not to mention directionals, high hats and an exciting new wall wash. To top the line, there's a complete new group of concrete pour boxes, plaster frames and night lights.

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Beverly Wilshire Hotel chooses rich red Bigelow Carpet for the charming La Bella Fontana Room

Thick, thick Bigelow Carpet in deep crimson adds elegance to a jewel-like dining room. This specially-woven all wool face Wilton is but one of the luxurious Bigelows selected by the Beverly Wilshire Hotel.

Bigelow Carpet is selected by leading designers for their most important hotel and motel installations. Reasonable price, long economical service, and top performance under traffic—as well as beauty—are prime considerations in every Bigelow Carpet designed for use in public areas. Special designs, colors and textures available. If you plan an installation, consult Bigelow’s carpet specialists about colors, patterns, weaves, at prices you can afford.

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For more data, circle 41 on Inquiry Card
You don't wait for the Mark IV.
It waits for you.
Mark IV Elevators don't nest at the top of the building and don't waste time going to the bottom, unless there's a call there. They wait in between to instantly answer calls directly as they come. That's why they give up to 30% faster service than the most efficient system before Selectomatic Mark IV. And that's why new and modernized buildings everywhere are installing Mark IV's. Ask your Westinghouse Elevator representative for more information. You can be sure... if it's Westinghouse.
ARCHITECTS AND ENGINEERS WIN AWARDS FOR DESIGN IN STEEL

The American Institute of Iron and Steel recently honored 48 of the nation's architects, engineers and designers in its first national Design in Steel Award program.

Some 500 designs of structures and products in eight categories of steel were submitted. From them, 10 award winning designs and 16 honorable mentions were selected, judgment being based on imaginative use of the different kinds of steel and other criteria which included esthetic appearance, durability, economy of production, efficient use of space.

Members of the jury were: Edmund Friedman, president, American Society of Civil Engineers; Ronald B. Smith, president, American Society of Mechanical Engineers; Dr. Robert Raubebaugh, president, American Society for Metals; Leon Gordon Miller, board chairman, Industrial Designers Institute; Jay Doblin, past president, American Society of Industrial Designers; Arthur Pulos, head of industrial design program, Syracuse University; Morris Ketchum Jr., director, American Institute of Architects; A. G. Odell Jr., second vice president, A.I.A.; and Robert Anshen, F.A.I.A.

Award winners in Category I, Galvanized Steel Sheet, were James J. Nargis and Edwin S. Darden, architects, for a design of a calibrating station tower for the Division of Weights and Measures, Department of Public Works, Fresno County, Calif.

Vacation Village Project, Mission Bay, San Diego, Calif. Architects, Spencer and Lee; structural design, Robert Fogg of Lawrence, Fogg, Flarer & Smith; ornamental iron work, Valentino Agnoli; contractor, M. H. Golden

continued on page 86
We could tell you how great this new drawing pencil is but you won’t believe us until you try it.

So try it.

VENUS Pen & Pencil Corp., 50 W. 44 St., N.Y. 36, N.Y.
Gentlemen: I’ll try it.
Send me the new Venus Drawing Pencil Sampler Kit so I can make my own drawing board test.

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EVERY ARCHITECT SHOULD READ THIS TRUE STORY... BY BRADLEY WASHFOUNTAIN

The new school exists only in your mind and, in fragments, on your design roughs. Hour after hour, you rack your brain for ideas; the lash of your own professional pride forcing you to make every room perfect — functional, practical, aesthetically pleasing. Then you come to the shower room, and you ask yourself, "How can I satisfy every requirement . . . keep installation costs to a minimum, use as little floor space as possible, yet handle heavy traffic . . . and still retain some creative flexibility?" The answer: specify Bradley Group Showers. They serve as many as
six people with only one set of plumbing connections, reducing installation costs as much as 80%! They require so little floor space that you can convert even the smallest area into a high-capacity shower room. They save water, maintenance time and expense. And they move traffic faster than any other showers. Creative latitude? There are five different types: Columns . . . Multi-Stalls . . . Wall-Savers . . . Panelons . . . and Modesty Modules. And each is available in stainless steel, or enameled mild steel in standard grey or special colors (except the stainless steel Panelons). Small wonder that Bradley Showers are now paying their way through schools across the country; and no wonder they're called . . .

THE SHOWERS THAT SOLVED EVERYTHING!

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Column Showers
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Wall-Mounted Showers
Wall-Savers and Panelons

Modesty Modules
Shower-Dressing Room
Awards for Design in Steel

continued from page 82

Architects Hellmuth, Obata & Kassabaum, Inc. received top award in Category III, Welded Wire Fabric Reinforcement, for the St. Louis Priory Church, Creve Coeur, Mo.

In Category IV, Steel Plate, two winners were selected: Harry R. Powell and Bjorn A. Stiansen, consulting engineers, for a bridge at Sultan, Wash.; and International Engineering Company, Inc. for spillway gates at Karnafuli River Hydroelectric Project, East Pakistan.

St. Louis Priory Church, Creve Coeur, Mo. Architects, Hellmuth, Obata and Kassabaum; structural engineer, John P. Nix; consulting engineer, Paul Wiedlinger; mechanical engineer, Harold P. Brehm; contractor, McCarthy Bros.

Award winners in Category V, Drawn Wire, were P. W. Freitag Jr., senior project engineer, and L. S. Kraft, staff development engineer, Goodyear Tire & Rubber Company, for design of a conveyor belt.

Hugh Acton, designer and manufacturer, won top award in Category VI, Steel Bars, for design of a folding pedestal table.

In Category VII, Steel Sheet or Strip, there were two winners. One was designer Henry Dreyfuss for design of the Pal Injector Razor for American Safety Razor Company. The other was Walter Furlani, J. W. Stringer and staffs of I.B.M. General Products Division for design of a Data Processing System.

Professional office building, Pasadena, Calif. Architects and engineers, Smith and Williams

Smith and Williams, architects, won top honors in Category VIII, Structural Steel, for use of this kind of steel in a professional office building in South Pasadena.

Honorable mentions are as follows:

Category I, Galvanized Steel Sheet—Harrell & Hamilton, architects, Republic National Bank, Dallas

Category II, Concrete Reinforcing Bars—Murray-Jones Murray, architects, roof of St. Patrick's Church, Oklahoma City

continued on page 99

proves practical and attractive for field house

“Prestressed concrete was a logical material to use with the precast concrete wall panels which form the major part of the enclosing walls of this building,” say the architects. And they add, “From an architectural point of view the prestressed members when exposed on the interior make a very handsome and interesting ceiling construction, particularly in areas where floating acoustical ceiling panels were used in conjunction with the prestressed members.”

Structurally speaking? The contractor states that the ease of handling the prestressed members saved a great amount of time and that the building was “closed in” sooner than would have been the case with more traditional materials. The same crew that erected the walls also erected the prestressed roof members, resulting in easy coordination of labor and reduced erection cost.

Write or wire us for information on prestressed concrete. We are the original producers of prestressing wire and strand in this country and can give you the basic design and technical data you need. Just tell us what type of structure you are considering. We can also put you in touch with experienced engineers and fabricators in your area. The Colorado Fuel and Iron Corporation, Denver 2, Colorado—Trenton 2, New Jersey.

Section drawing shows how the prestressed concrete Lin Tees were connected to the precast load bearing wall panels with dowels (not shown) to eliminate all columns.
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DEVELOPERS OF SPACE-RATED PAINTS
Nesbitt Architectural Sill-line

designed with you in mind

You are the man who must compose all the parts of a building—including the heating, ventilating and air-conditioning equipment—into an esthetic as well as utilitarian structure. You share the engineer’s concern for a product’s technical competence, quality construction, and proved performance, of course; but you value also the good elements of line, form, mass, space, and color—your tools of design.

In more than 45 years of product development, we believe we have proved our ability to meet the needs of mechanical engineers and contractors—nor have we failed with architects and owners! But of recent years especially, Nesbitt has become more mindful of your particular need (and your narrowing choice) of heating, ventilating and air-conditioning equipment that is styled to serve the contemporary mode. A special department of styling and the counsel of Designer Paul McCobb have given us products such as those pictured on this page, and on the next two pages in living color.

Beauty and performance are but two facets of Nesbitt Excellence.

For more data, circle 50 on Inquiry Card
The crisp, clean lines of Architectural Sill-line with its slab-type front, recessed sleeves, end-caps, corners, and the continuous bar-type grille have been created by Designer Paul McCobb. The linear flow of horizontal lines is accentuated by the folded bar-type grille when Architectural Sill-line is installed in continuous runs of standard length enclosures. Or, with the use of the telescoping sleeves for rhythmic accents, Architectural Sill-line is uniquely suited to panel wall structures and for mating with mullions, windows, or other optical segments. Two-tone colors provide interesting contrast for sleeves, end-caps, corners, and grille.

Architectural Sill-line has been added to the Nesbitt line for those many cases where the radiation must complement contemporary styling in today's finest interiors. Sill-line puts heat at the perimeter of a room or office, for space economy and for the well-being and productivity of the occupants. Its comfort comes by gentle, silent convection and radiation; it blankets cold surfaces, prevents "window shivers."

These are reasons enough for your choice of Nesbitt Sill-line; and now Architectural Sill-line adds rhythm to reason.

- Enclosures consist of a heavy, one-piece back panel and a three-sided front enclosure of 16-gauge furniture steel, with a rugged continuous folded grille. Front enclosure and back panel are interlocked by a flange at the top and tightened by wing fasteners at the bottom, for a rigid, durable assembly.

- The back panels, heating elements, enclosures, and accessories are all packaged separately. Back panels and elements may be installed during early stages of construction; enclosure lengths may be ordered and shipped after precise measurements have been verified—and installed when the painted surfaces will not be marred.

- Accessories consist of telescoping end-caps, sleeves and 90° inside and outside corners; column enclosures, valve compartment, and a screw-operated blade damper.

- Heating elements of seamless copper tubes and corrugated aluminum fins are available in ten types, each in six standard lengths (2', 3', 5', 7', 8', and 9'). A two-tube element is available for certain applications.

- Standard two-tone colors are light and dark beige; light and dark gray; the dark shade being used for discharge grilles and all accessories. Other Nesbitt colors are available on special request.

- Enclosures and accessories are finished in lustrous baked enamel, after a preparatory and rust-inhibiting process.

ENCLOSURE

STYLES, DIMENSIONS
AND CAPACITIES

Architectural Sill-line is available in five standard enclosure styles, sized to meet practically every need of capacity and appearance in perimeter heating.

<table>
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<td>Capacities, from 2230 to 2620 Btu/hr per linear foot of heating element.</td>
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Two levels opening on a central court are connected with a spiral steel stairway in this home designed by architects Nelsen & Sabin. Treads, hanging from steel bars, are set into triangular frameworks of light steel angles.

**Some architect-designed steel stairways**

On this and the following pages are a few examples of steel stairways designed by architects for steel-framed homes.

Some of the stairways are suspended. Some cantilevered. Some freestanding, supported by slender steel members. All are functional and handsome.

Often shop fabricated as a unit, steel stairways can be dropped in place with a crane and connected during erection of the framework.

In creating these designs, architects have used many types and sizes of Bethlehem structural steels—plates, tubing, channels, bars, flats, and angles.

Two levels opening on a central court are connected with a spiral steel stairway in this home designed by architects Nelsen & Sabin. Treads, hanging from steel bars, are set into triangular frameworks of light steel angles.

**BETHLEHEM STEEL**

Architect J. Herbert Brownell designed this attractive stairway. Treads, composed of 3-inch thick laminated wood, are suspended on one end from 3/4-inch diameter steel rods, and on the other end by 3-inch diameter pipe columns. The upper ends of the rods are welded to the bottom of one of a pair of 10 WF 15 beams which support the balcony.

Reflecting the nautical atmosphere of the San Francisco Bay Area, steel ship ladders are used in this house to connect the upper level to a sun-deck on the roof. The ladders are welded steel plates, with 1 1/2-inch square steel tubes used as railings. Architect was Rolf Eiselin.
Steel stairways like these add to the beauty of any home

This attractive floating stairway is made up of two 12-inch steel channels boxed in with 12-inch wide cover plates, ⅜-in. thick. Douglas Fir treads are supported by steel angles welded to the box core. Steel bars welded to the angles support handrails. The stairway spans 27 feet and is tied to a 14-inch wide-flange header beam across the upstairs opening. The structure was designed by architect Hewitt C. Wells.

Spiral steel stairway fabricated from steel plate connects parking and garden areas with the upper floor terrace in this Pennsylvania home. Architects: George Fred Keck—William Keck.

In this mountain retreat, a spiral steel staircase composed of plates and bars leads to a portion of the roof, which is used as a sun deck in the summer. The house was designed by Architect Thorne.

Small steel angles, channels, and tubing can be utilized in the construction of stairways as in this home designed by Richard Jay Smith. Welded rectangular steel tubing provides rigidity for open stair treads. Treads are composed of heavy-gage steel sheet, covered with wood and foam rubber pads. The stairway floats free of the wall and of a 6-inch steel column, part of the rigid frame of the house.
This spiral steel staircase connects three levels in a hillside home. It is composed of two strips of 3/8-inch plate, 8 inches wide. Steps are 11-gage plate with edges bent upward to form a low box to hold a layer of concrete. Each step is supported by lengths of No. 4 reinforcing bar and welded to the two 8-inch strips. Handrails are 1-inch steel pipe. Architect-builder, Allyn E. Morris.

Stair treads hanging from steel rods are covered with wear-resistant vinyl, making them easy to clean. Railings are made from steel channels. Each individual stairway tread is supported on 4 rods by flanged washers welded under the tread. Architects were Cooper and Sawers.

Carpeted stair treads float in space over a reflecting pool in this home designed by architect Bernard Zimmerman. A 6-in. diameter steel pipe anchored at top and bottom is the only support for the structure. The pipe is anchored to a concrete footing at the base of the stair, and welded to a steel beam at the second floor landing. Treads are 3/4-in. steel plates projecting from 2-in. diameter pipe supports. The plates are covered with wood, bolted in place, and carpeted. Walnut hand railings are supported by 1/2 x 1 1/2-in. steel bars.
IF THE NEW FLOOR DISCOLORS, 
WHOSE REPUTATION WILL SUFFER?

Stop floor problems before they begin by specifying a floor maintenance program!

The new floor is beautiful. Everybody's happy. Happy, that is, until the floor begins to change color. The culprit? Improper maintenance. But how hard it is to convince others of this! When a new floor begins to look old, poor maintenance habits are usually the last to be blamed. "Should this type of floor have been specified in the first place?" "Was the floor laid correctly?" ...and countless other thoughts may be running through their heads.

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For more data, circle 52 on Inquiry Card
Design in Steel Awards

continued from page 86


Category IV, Steel Plate—California Division of Highways, Bridge Department, Pecwan Creek Bridge and Whiskey Creek Bridge; Katsuyuki Matsushita, Hideki Shimizu and John O. Phillips, architects—Albert A. Kelly and Associates, structural engineers—Valentine, Fisher and Tomlinson, mechanical engineers, fountain dome, Seattle World’s Fair


Category VIII, Structural Steel—Byron Hackler, architect, school in Tazewell County, Ill.; David Thorne, architect, private residence, Marin, Calif.; Pierre Keenig, architect, private residence, Palos Verdes, Calif.; Robert Kitchen and John Funk, architects, dining commons of residence hall, University of California; Ferrier-Dorland & Associates, structural engineers, radar antenna support towers for U.S.A. Satellite Communications Agency

URBAN RENEWAL EXHIBIT FOR LOAN

Regional offices of the Housing and Home Finance Agency have now available for loan to interested urban renewal groups a new exhibit portraying the urban renewal story, its objectives and accomplishments.

Weighing less than eight pounds when packed in its special reusable container, the exhibit consists of four 18- by 27-inch folding panels of photographs and descriptive matter. Display requires only a table top or desk 5 to 7 feet across. Complete instructions for setting up the exhibit are included in the shipping container.

The exhibit is not available from the central Washington office. Interested local or regional groups or organizations can obtain the new table top exhibit from the HHFA regional office serving their area.

The design and construction of custom industrial and commercial doors to meet your esthetic and functional requirements is a specialty with Richards-Wilcox. From Ark Doors, Industrial and Fire Doors, Blast Doors, Radiation Doors, Straight Doors, Curved Doors, Large Doors, Small Doors, whatever type you want—R-W can supply them plus all of the necessary hardware and electric operators where required. When remodeling remember that the use of custom-fit doors can provide greater economy than rebuilding openings to accommodate standard doors.

Your local R-W Applications-Engineer is a specialist in this field—he would appreciate the opportunity of consulting with you in regard to your door problems.
Speakman has a beautiful one-handed way to control water in the kitchen.

NEW Solitaire faucet brings a new kind of pleasure and convenience to the kitchen. The user can pre-select the temperature before turning on the water... then adjust both water flow and temperature simultaneously. All with fingertip feather-touch control. Gleaming polished chrome plated brass for Beauty. All brass and stainless steel construction for Quality. Cartridge operating unit of long-wearing stainless steel for Economy. Designed, Styled and Engineered for you. For details, write for Brochure S-117.

*T.M. Property Speakman Company
one hand controls water flow and temperature

WHEN YOU SPECIFY SKEAMAN, YOU SPECIFY SKEAMANSHIP—THE MODERN APPROACH TO WATER MANAGEMENT IN THE HOME, THE PLANT AND THE INSTITUTION

For more data, circle 54 on Inquiry Card
FIVE HAUGHTON AUTOMATIC ELEVATORS HELP FULFILL A CREED... "Building as it Should Be"

"Building as it should be" is a way of life for the Kreedman organization. They've proven it again with the United California Bank Building... eleventh major office building they have developed since becoming investment-builders and general contractors in 1946. In this distinctive new building, largest in Beverly Hills, an environment of matchless beauty, comfort and convenience gives tangible meaning to the Kreedman creed. Take the elevators, for example. Five Haughton elevators under fully automated electronic control provide uncanny speed and smoothness. A new, advanced-design computer created by Haughton Eleveonic® maintains constant surveillance and controls car travel to match traffic needs exactly. Include Haughton elevators in your building or modernization plans. Contact your Haughton sales office (listed in the Yellow Pages) for full information, or write: Haughton Elevator Company, Division of Toledo Scale Corporation, Toledo 9, Ohio. Passenger and Freight Elevators, Escalators, Dumbwaiters, Complete Maintenance Service.

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. in U.S. Patent Office.

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STAINLESS STEEL

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For more data, circle 56 on Inquiry Card
the most exciting ideas take shape in plywood
This parasol-like plywood folded plate roof, suspended beneath slender reinforced concrete beams, is another prime example of how modern materials and engineering systems can be combined to create a new architecture, free of traditional restraints. The plywood canopy is so nearly self-sustaining that each folded plate needs only two beam connections. The result is a large clear-span structure of remarkable harmony and simplicity. Construction was efficient and economical. Components were site-fabricated with plywood and light lumber framing, and crane-lifted into place. As in so many of today's new architectural forms, only plywood had the requisite design flexibility coupled with adequate structural and appearance values. For more information, write (USA only) Douglas Fir Plywood Association, Tacoma 2, Wash.
Foldoor’s superior track, trolley and hinge system... backed by the strongest warranty in the folding partition industry... provides year after year of easy operation... dependable service.

In the normal operation of a folding partition, the track, trolley and hinge system absorbs the most strain and stress. The proof of Foldoor’s superior design is evidenced by its dealer warranty. Hinges, trolleys and trolley pins are warranted for nine years over and above the usual one year warranty on the entire door and all accessories. The track is warranted for the lifetime of its original installation.

For sound control and fabric information, see your Foldoor representative. Ask him about his “Warranty Plus” program. See the complete Foldoor line in Sweet’s Architectural File 16f/Ho.

PITTSBURGH HAS URBAN STUDIES: FELLOWSHIPS OPEN

Pittsburgh University’s comprehensive education programs for urban studies could easily place many times the number of available graduates, says Donald C. Stone, dean of the Graduate School of Public and International Affairs. The shortage of qualified personnel for leadership in administering and revitalizing American cities is acute.

Four fields of urban specialization are available at Pitt: Urban Management; Urban Renewal; Metropolitan Studies; and Urban and Regional Planning. Enrolled for 1962-63 in the school’s urban affairs programs are a total of 41 master’s candidates (full-time and part-time). Of these 28 are engaged in urban renewal studies.

Each student has a program tailored to his background, needs and career objectives, as well as to his field of specialization. He may enroll as a candidate for the Master’s, Ph.D. degree or as a special non-degree member.

Fellowship and loan funds are available for talented persons who require financial aid. For the second year, the Pittsburgh Plate Glass Foundation has granted the school’s urban renewal program four fellowships. Eligible are men and women who need financial aid and have not been full-time graduate students, and who are U.S. citizens or are acquiring citizenship. A maximum stipend of $1,500 per term is given each fellow, according to need, awarded for a three-term program of professional education.

Candidates for these fellowships are judged on the following qualifications: previous education, experience, demonstrated leadership and breadth of vision. Applications for Urban Renewal and Redevelopment Fellowships should be submitted to the University no later than April 30, 1963.

For information on the fellowships or on Pittsburgh University’s urban studies program, write: Dean Donald C. Stone, Graduate School of Public and International Affairs, University of Pittsburgh, Pittsburgh 13, Pa.
Huber, Hunt & Nichols, Inc. is pleased to announce the formal opening of its Western Division Offices in Sunnyvale, California.

Mr. William B. Huffman, vice president has been appointed Manager of Western Division Operations.

Huber, Hunt & Nichols, Inc.
1128 West Evelyn Avenue, P.O. Box 187
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Telephone: A/C 408...245-4230
Revere Sheet Copper enables Architect to combine beauty and long life in a striking, modern roof design ...

FOR SHRINE CHAPEL OF
OUR LADY OF ORCHARD LAKE,
DETROIT, MICHIGAN
In conceiving the design of this structure the architect, Walter J. Rozycki, visualized the bold, soaring sweep of the roof as the commanding element of the overall structure, both in size and contour. Said he, “Such a roof, without the use of copper and its characteristic design flexibility, would have been virtually impossible.”

Other contributing factors in the selection of copper were its permanence, handsome appearance, and ease of fabrication. And NOW—with the price of sheet copper the lowest in years, it pays to look first to copper.

Mr. Rozycki’s plans called for flat, stepped-down pans. While this is a novel method of sheet metal construction, Mr. Rozycki, in collaboration with the Revere Research and Development Department and Technical Advisory Service, worked out a technique which enabled the sheet metal contractor to install these pans using only standard tools.

Details of construction are shown in the accompanying illustrations. The 4” x 4” vertical battens are spaced 10’0” on centers; the 2” high steps running horizontally between the battens are spaced approximately 20” apart. Horizontal roof pans are of 24” wide sheets of 20 oz. cold rolled Revere Sheet Copper. A tapered layer of rigid roof insulation is laid between the horizontal steps.

All told, 35,000 lbs. of Revere Cold Rolled Copper were used in 24” x 120” sheets. The versatility and design flexibility of copper is abundantly evident in the unusual details and the final striking results.

For unusual and beautiful architectural effects, remember: “Design with Copper in Mind”. Revere’s Technical Advisory Service will be happy to work with you.

SEND TODAY for free copy of “Copper and Common Sense,” Revere’s 140-Page Brochure illustrating the design principals and techniques of sheet copper construction. Also free companion piece, “The Revere System of Copper Flashing,” for the complete weatherproofing of masonry buildings. Address Dept. “S-2” at address below.

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Sensitivity of Definition in the Forecast Series of Movable Walls by Mills creates rhythmic order in a variety of panel configurations of steel, glass, and wood. The emphatic, single-recess post above is one of twelve different ways Mills uses the third dimension to achieve fresh articulation in modern wall design. This flexibility in the Forecast Series gives designers complete freedom to create, with one Mills design group, unique interior wall systems for every client. Write us for details.
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Experience has proved the wisdom of their choice. The quality control exercised by Pratt & Lambert at every stage in the manufacture of P&L paints and varnishes assures products that architects trust. Throughout the United States and Canada, architects specify Pratt & Lambert products for their most particular jobs. Shown here are only a few of the fine buildings in Quebec and Ontario provinces in which P&L products have been used. Color styled with exclusive Pratt & Lambert Calibrated Colors®, these buildings reflect credit on their architects and owners.

Make full use of the knowledge and experience available from your P&L representative. He is equipped to offer helpful suggestions on finishing problems — surface preparation, color styling, specification writing, new products. Trust him to recommend the right materials for maximum protection and service. Phone him or write: Pratt & Lambert Architectural Service Department, 3301 38th Ave., Long Island City 1, N. Y.; 4900 S. Kilbourn Ave., Chicago 32, Ill.; 75 Tonawanda St., Buffalo 7, N. Y.; 254 Courtwright St., Fort Erie, Ontario.

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Make full use of the knowledge and experience available from your P&L representative. He is equipped to offer helpful suggestions on finishing problems — surface preparation, color styling, specification writing, new products. Trust him to recommend the right materials for maximum protection and service. Phone him or write: Pratt & Lambert Architectural Service Department, 3301 38th Ave., Long Island City 1, N. Y.; 4900 S. Kilbourn Ave., Chicago 32, Ill.; 75 Tonawanda St., Buffalo 7, N. Y.; 254 Courtwright St., Fort Erie, Ontario.

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We counted no fewer than 24 significant mechanical superiorities in LPI's new line of troffers. These features contribute unusual strength, rigidity, foolproof operation and light-tight construction. They mean fast installation, in any ceiling system, singly or in continuous rows. They assure an attractive, easy-to-maintain lighting job.

**Two dozen ways you can measure quality in LPI's new fluorescent troffers**

1. Integral, full-length side-trim flange is narrow and is formed back on itself for extra rigidity and clean, tight ceiling fit. 2. Functionally designed multiple bends in the 20 ga. steel troffer body provide exceptional rigidity and form a precision, light-tight door jamb. 3. Double-channel diffuser frame also features multiple bends with integral corner gussets for great rigidity and light-tight construction. Frame is full length of troffer for smart appearance in continuous rows or individually installed. 4. Diffuser frames hinge from either side. 5. Latch is simple, manual device providing positive closure. 6. Troffer housing is trimmed to receive wrap-around end cap insuring tight flange joints with absolutely no progressive lengthening in continuous rows. A stiffening flange on end caps locks housing to correct width and forms diffuser frame jamb at ends. There are no light leaks. 7. through 24. To see all 24 of these important superiorities, why not let your LPI representative personally show you one of our troffers. Or write for our brochure "Two Dozen Measures of Exceptional Quality" plus our new 32-page Troffer Lighting Catalog.
most **THOUGHTFUL** new window in a decade
New venetian blind

EXCLUSIVE FEATURES

**Vertical pivot action.** Awkward, risky methods used to operate horizontally pivoted windows are unnecessary. **Concealed pivot mechanism.** Window can be reversed without raising venetian blind. **Removable aluminum glazing beads.** Window may be reglazed without taking frame members apart.

**Square windows.** All four corners are squared to lend approved architectural appearance. Initial glazing is faster, easier. Reglazing, too, if required.

**Venetian blind controls.** Control knob sets angle of louvers (Inside glass). Side-hinged feature for easy cleaning. Gives access to inside surfaces of glass without awkward reaching or need for open holder arms.

*Vertical Pivot point is the important difference!*
Make all four corners square. Make the window pivot vertically. Conceal the mechanism. Then, make it next to impossible for anyone except the window washer to disturb the uniformity of the venetian blinds. This is how Adlake designed the most thoughtful window in a decade! Thoughtful of the architect, thoughtful of the owner, thoughtful of the tenant—and even thoughtful of old customers. It's basically the Series 1000 vertical pivot window, already proven in thousands of installations. How will it benefit you? Read on and see. Then contact your nearest Adlake representative.

**better looking... and stays that way**

... thoughtful of the tenant
This window was designed with people in mind. They choose the louver angle that is right for them. A twist of the wrist dial it. No exposed cords to tug. Blinds keep up to 68% of the sun's heat outside the building where it belongs. Less street noise, too.

**cuts costs before and after**

... and even thoughtful of old customers
The new Adlake Series 1400 vent fills the same size opening as a Series 1000. Owners who need the special features of the venetian blind window can substitute one vent for the other. Replacement is economical, easily arranged. Inconvenience is held to a minimum. Your Adlake representative will gladly supply details.

... really thoughtful of the owner
Adlake's Series 1400 vertical pivot window really cuts maintenance and utility costs. The window is faster, easier to clean. Can be reversed a full 360° with no time out to raise the blind. And even when reversed, there's the positive seal provided by the neoprene impregnated fabric weatherstrip. A 2/3 inch air space between the panes acts as insulation. Naturally, heating and air conditioning cost less.

See other side for further particulars and name of your nearest Adlake representative.
MORE FEATURES OF THE ADLAKE SERIES 1400 VP WINDOW


Finish. Adlake satin etched, Anodized, Anodclad greys, Kalcolog or Duranodic.

Minimum air infiltration. .070 cubic feet of air per minute per foot of vent perimeter at 50 m.p.h. wind velocity.

Key operated hardware for reversing vent. Permits only authorized persons to reverse windows. Locks are designed to prevent removal of keys except when window is in a locked position.

Cutaway reveals double weatherstrip, squared corners, double panes and venetian blind.

for full particulars see your nearest representative
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"Intensive-care" units and panel.
"Multi-care" unit for private room.

For more data, circle 62 on Inquiry Card

For more data, circle 63 on Inquiry Card
THE Stellar SERIES
by American Seating

A dramatic departure in theatre and auditorium chair design
The look is new
The idea is new
You select every element of the design

Colors, textures, shapes, sizes—you can work with them all. The Stellar Series by American Seating gives you free hand with fabrics, a wide choice of aisle standards. You can select from several widths and styles of seat and back, several types of mounting.

The idea? To make theatre seating an integral part of theatre design. The key to it is choice—and the Stellar Series is the first and only chair to offer you choice of every element of design.

Talk to American Seating about any problem involving seating. Technical advice on floor plans, vision, chair spacing economies, and other subjects is available at all times. Write Dept. AR-1 for brochure on new Stellar Series.

The Stellar chair has a very long back to protect the seat from feet. There are three variations of the Amerflex® plastic back (left), and two of the upholstered back (right).

Single or double armrests are available. You may choose either type.

Exclusive Soil-Guard (optional) protects the upholstery at the top of the chair back.

For more data, circle 64 on Inquiry Card
Architect Stanley Tigerman creates a motor hotel of concrete block: Zonolite Masonry Fill Insulation makes it practical (see table)

Zonolite commissioned architect Stanley Tigerman of Tigerman and Koglin, Chicago architectural firm, and engineer Norman Migdal of Chicago to do this motor hotel of insulated concrete block.

It brings some interesting ideas to light.

First, note that the interior walls are exposed block; the same block that is exposed on the exterior. Zonolite Masonry Fill Insulation in block cells cuts the heat transmission through walls from 35% to 50% or more, keeping interior surfaces comfortable. The water repellent nature of the material keeps moisture from collecting inside the wall, so that interior paint doesn't blister and peel.

The insulation-filled cores in the cored concrete floor and roof slabs keep floors comfortable and minimize heat loss through the roof.

A benefit unexpected by most is the sound dampening capability of Zonolite Masonry Fill...a 20% loudness reduction in this case.

You have probably noticed from the table that the size and cost of the necessary heating and air conditioning units are considerably reduced by using Zonolite Masonry Fill Insulation.

Contrast this (and the reduced operating costs) with the approximate installed costs of Zonolite Masonry Fill Insulation.
The installed costs are low for two reasons. First, the initial cost of Zonolite Masonry Fill Insulation is low. Second, to install it, you just pour it out of the bag into the block cells until the wall is full.

For more information about this remarkable insulation, write Department AR-43 for Bulletin MF-68.

ZONOLITE
Zonolite Company, 135 South LaSalle St. Chicago 3, Ill.
On the ground or in the air, depend on NEVAMAR® for durability

Years from now, the NEVAMAR surfaces at Washington’s new Dulles International Airport will still look like new—despite round-the-clock punishment from elbows, bumps and baggage.

Flying high above this hubbub will be the new jet-prop Gulfstream of J. P. Stevens & Co., Inc. Here, too, NEVAMAR is at work supplying beauty and durability to the executive plane’s interior.

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ALVAR AALTO TODAY

By Frederick Gutheim
So often has the American Institute of Architects given its Gold Medal at the end of an architect's career—if not posthumously—that the award to Alvar Aalto is an interesting departure. While the Finnish architect is only 65 years old, he is at the peak of his productivity, with unmatched international building activities, and the added responsibilities of a national cultural leader. He is far beyond the celebrated youthful designer of exhibition pavilions and furniture, or of such humanistic buildings as the Viipuri library or the Villa Mairea, which launched his reputation in the 1930's. Behind him, too, is the "red period" which commenced with the rugged brick Baker House dormitory at Massachusetts Institute of Technology and culminated with the Säynätsalo town hall. Today he is Finland's architect of great public buildings, corporation headquarters and city plans; and the world architect with the most widespread practice and active projects in Scandinavia, Germany, France and the United States.

Aalto belongs to the generation of revolutionaries and pioneers who laid the foundations of our modern architecture. The strength of this movement and the individuals who constituted it is well illustrated by the high proportion of survivors and the vigor of their practice today. This vitality has its roots planted deeply in the humanistic and international idealisms of youth, and the rigors of economic austerity. The survival of this earlier architecture into today's more self-centered, divided and affluent world has not been accomplished without change, and often in the work of Aalto, as with his contemporaries, we are interested in how the transition to advanced building technology, more abundant space, more luxurious materials has been accomplished. The question is relevant to the future of architecture, and specifically its future in the Europe of the Common Market. If the speculative energies and appetites of Milan, Paris, London and the West German cities are to produce anything more than a crude and unworthy materialism, there must be a further development of architectural and urbanistic thought.

As should become apparent with the publication this summer of "Alvar Aalto 1920-1960," a collection comparable to the Girsberger edition, "LeCorbusier 1919-60," with its accumulating volume and longer span, one is naturally more conscious of evolution from earlier work and the continuity of earlier design themes and styles. In this perspective the Viipuri Library is the most seminal work; its sunken reading room, fine undulating wood ceiling, overhead lighting and certain other features introduced here repeating themselves over the years and still today. From the Villa Mairea one sees the L-shaped living room with its careful transitions of light and atmosphere from one part to another, the stately dining room, the secluded library, the management of levels to add spatial variety and richness—all echoed...
and developed further in later buildings and buildings still to come. A continuity is evident also in the treatment of interior spaces. The entrance halls and public courts that mark the Artek Building in Helsinki or Aalto's own summer home appear again in his larger and more formal works. But a more profound continuity of personal style is evident in Aalto's absolute control of the building, his achievement of sympathetic interior spaces with perfect sound, light, air and atmosphere, the masterful line defining silhouette and volume, and the command of detail, whether in the selection of materials or the design of hardware, lighting fixtures, furniture and fabrics. It is against this rather autocratic personal style that the playful, whimsical, imaginative and even irrational touches with which Aalto endows his buildings acquires a special value, humanizing what in other architects often regrettably becomes a cold absolutism.

The origins of this style have been conventionally traced by European critics to the north, which they have endowed with a romantic and mystical quality we have reserved for the "Wild West" or the "great open spaces." Nonetheless, the regional character is profound as well as precise, and it extends beyond the specifics of climate, building materials and the habits of living; and unless you like these qualities in the civilization of the north you will not respond to them in Aalto's architecture. The woods and their solitudes, the shallow lakes with their splendid sky-reflecting colors and surrounding border of pines and birches, and perhaps most of all the wide horizons and mysteriously modulated light—these are the qualities to which we Americans particularly respond.

Although I had earlier visited Finland in the summer and fall, it was the present opportunity to go there in mid-winter that revealed the ultimate regional factor in architecture. When the snow covers the flat ground, as it does for half of the year, the dark woods are strongly silhouetted against the lighter snow-covered broad fields and lakes. In the neutralizing snowfall especially, a dark and light pattern forms in the atmosphere. Forms are flat and distinctly outlined although not sharply edged. The lines in this pattern separating dark and light, are of nature's making—and of man's. One sees the curving lines of the lake shore, the round masses of wooded areas, or even a reflection of the underlying geology in topography and vegetation. But one also sees the geometry of fences, roads, fields and other works of man, not least buildings. A blue tone floods the air, especially during the drawn-out hours of dawn and dusk, when nothing is black or white. The winter sun is intermittently seen, often brilliantly clear, its low angle casting long shadows which emphasize the patterns made by wind and shadow in the snow.

This is a world conducive to fantasy, in which the
imagination operates free from the restraints of reality, challenging the designer of buildings to suggest in his work something comparable as an esthetic experience, yet a work of man not of nature, able not only to survive the incessant competition of these natural conditions, but actually to employ them. One may question if the climate and atmosphere of Finland are so wholly decisive. The answer is best found not by a comparison with other countries and other architectures but with the arts of Finland, especially the folk art of weaving as expressed in that unique creation, the wall rug (ryijy rug).

Maison Carré

If one looks for masterpieces in Aalto's work today the most impressive single accomplishment is the Maison Carré, an elegant holiday house for the Paris art dealer and collector, Louis Carré. While smaller in scale than the Villa Mairea, it embraces the same qualities of that much admired earlier work, and further incorporates later design themes explored in Aalto's own summer house and other buildings. Overlooking the characteristically rural landscape of the Île de France, at the edge of the town of Bazoches, some 30 miles south of Paris, the Carré house makes the most of its high situation and magnificent views. From the large entrance hall, with its beautiful natural studio lighting, framed by an undulating ceiling of pine strips, one is carried down to the living room with its panoramic windows beneath the overhanging roof. This entire area of the house is carefully studied and lit to provide wall space for a handsome collection of modern paintings. It also contains a generous working area for the owner. To one side a small library exploits the house's change in level to secure a surprisingly rich development of a small space, and its completion with fine cabinet work.

The Carré house exhibits the elegance and refinement one associates with Aalto's infrequent houses brought into harmony with its expression in France. While the dramatic and useful handling of spatial volumes is certainly the outstanding feature of the house, its superb livability, shrewd management of contours, and absolute control of interior atmospheres are clearly established. To have achieved this combination of the formality demanded by an almost oppressive burden of exhibiting great paintings and a relaxed, informal domestic environment is the solution to quite a different problem than the "studio house" for Mairea Gullichson in 1938. And to have handled such opulence and unbounded resources with modesty, yet without shrinking from true luxury, is an equally important achievement.

Enzo-Gutzeit

A corporation headquarters for Finland's largest industry, the cellulose firm of Enzo-Gutzeit, challenged Aalto to meet a characteristic architectural

Above: Entrance hall and gallery with undulating ceiling of pine strips. Furniture and lighting fixtures shown in living room (top right) and study (bottom right) were designed by Aalto.
problem comparable to our similar buildings for aluminum, steel, soap, whiskey and finance. The impressive site adjoins and overlooks the residence of the president of Finland, it fronts Helsinki's busy market square and picturesque harbor, and it is surrounded by such monumental buildings as the Russian cathedral, the town hall, the university and departments of the national Government. Enzo-Gutzeit itself is "a mixed enterprise," half of its capital being supplied by the Government, and in addition to its operations in lumbering, it is the principal producer of timber, millwork, plywood, wallboard and paper products, an important manufacturer of sawmill machinery, and the operator of an extensive shipping fleet.

Aalto's design is a deliberate effort to conform to these surroundings, and to meet the expectations of his client and the public. The architect has subordinated his characteristic personality. The resulting building, while it does no violence to its setting, adds little to an historic and architectural complex that is Finland's pride. The regular classical form is quiet, its scale conforms to the surrounding public buildings, its facing of Carrara marble contributes to the water approach to traditional Helsinki as "the white city of the north." An exercise in cultural humility, the architect has further contented himself with a practical solution to the functional problems of the building as an accommodation for top executives.

The more characteristic expression of the architect is found in the interior spaces where the corporate personality of the firm is projected in reception halls, executive suites, a board room and executive dining rooms. Here Aalto's long-recognized abilities as an unsurpassed architect of interiors are given full play. Deeply recessed, triple-glazed and specially ventilated windows regulate the temperature, humidity and natural light appropriately to Finland's long, dark winters. Laminated wood doors of double thickness (hardly a millimeter apart) provide virtually soundproof seclusion. The company's best materials are exhibited in flooring and especially in the paneling of the principal offices. Here Aalto has relied again on the laminated red plywood strips he first used in the undulating ceiling of the lecture hall in the Viipuri library. These are cut from pines that have "died a natural death" in the midst of the forest and remained standing to season themselves perfectly dry. The search for such selected trees is long, costly and difficult, and the material is treated with an appropriate respect that could hardly be equaled by the traditional Japanese. The laminated strips are slightly more than a half an inch in width, carefully matched and contrasted, and deliberately butt-ed light against dark to emphasize the color range.

In the design of special lighting fixtures and hardware, and the specification of furniture, fabrics and decoration, Aalto has further defined spaces of pub-
lic purpose, great dignity and masculine character.

It is such a display of masterful interior design that will probably result from the invitation Aalto has received to design the offices of the Institute for International Education in the Harrison and Abramovitz building facing the United Nations Plaza, a most fitting opportunity for his first American project in 15 years, if something less than the full building opportunity one hopes he will still be offered in the United States.

Seinäjoki Civic Center

A church is a public building in Finland with its established religion, and church design is normally the result of an architectural competition. Aalto's important contemporary civic center for the central Finnish town of Seinäjoki commenced with his winning design for the city's church, a design closely resembling his concurrent Vuoksenniska church although more regular and conventional in plan. The church proved the start of a much larger complex, the second building in which is the town hall, completed last year. The master plan for the larger group further provided a buffer building between the church and the town hall, accommodating supplementary ecclesiastical activities, and two new buildings for a community theater and a library, work on the design of which is now proceeding. The complex as a whole is thus the result of evolution rather than master planning, but the reciprocal relations of individual building designs, and the development of the spatial pattern as a whole in the hands of a single designer illustrates an important borderland between architectural and planning design. The exterior of the Seinäjoki town hall, similar in structural outline to Aalto's town hall in Avesta, Sweden, is entirely faced in dark blue tiles manufactured by the Arabia potteries, a half-rounded design created and first used by Aalto in the interior public spaces of the Pension Bank and the Helsinki Hall of Culture. In another climate this glittering treatment would be less acceptable, and even here it is hard to divest the material itself of ignoble associations, yet in the total context an interesting and valid building has been created if not at the level of the earlier town hall at Säynätsalo.

The counterpoint between the white walls of the church and its dark copper roof with the blue tile town hall is less a matter of color than of silhouette.

A Plan for Central Helsinki

In the body of his work Aalto's contributions to city planning have been more significant than those of any other modern architect with the possible exception of LeCorbusier. One has but to recall his wartime reconstruction plans, the proposal for the delta city of Oulu, the regional city of Imatra to appreciate the power and originality of his creative abilities as a planner. Today these are being tested...
again in the solution of the problems of the center of Helsinki, the center of a rapidly expanding collection of suburbs and the capital of a rapidly developing nation. Without developing fully the institutional factors of politics, economics and social conditions which frame this plan, it is still possible to describe it sufficiently to reveal its distinctive character as a design, and to indicate its relevance to other cities of the Western world whose traditional urban fabric is torn by growth, change and most of all the automobile.

In the case of Helsinki its location on a peninsula has tended to preserve its rather ecological pattern, even as bridges have been built to the surrounding islands of the archipelago, yet the lack of a coherent metropolitan regional plan reflects an underlying inadequacy of municipal form, organization and planning technique. Successive plans for the rapidly developing central city have increasingly focused on the problem of circulation as the sprawling suburbs pour their busloads into the peak hour traffic. The congestion is especially acute in the sector around Siren's classical Parliament House, the elder Saarinen's railroad station, and the commercial retailing and white collar employment center.

Aalto's plan for this area, prepared for a select commission following half a dozen earlier proposals by city planning agencies and as elicited by competitions, now appears likely to resolve deep-seated difficulties. His plan proposes a new express highway on the line of the existing rail approach, carrying traffic into and through the city. Large new parking areas will cover the existing unsightly railroad yards, and they in turn will be covered with new shopping facilities. Bordering the Töölö inlet, separating it from the new expressway, sites are provided for a battery of cultural buildings, including a concert hall, theater and museum, terminating at its upper end in the area dominated by the Olympic Stadium and exhibition halls. At the opposite end, the retail center would be freed of through traffic which would be carried below grade, and a large part of it would become a raised pedestrian platform. Not the least value of the plan as contrasted with earlier proposals is the removal of traffic and its attendant difficulties and pressures from the market square in front of the President's house, and from the historic and monumental quarter of the city. While the plan as a whole still lacks full acceptance it has gained impressive endorsement and parts of it are now being carried out.

A powerful designer's imagination is seen at work in Aalto's plan for the center of Helsinki, a project in every sense as important as Stockholm Centrum, or the comprehensive redevelopment plans for major American cities. By contrast with the earlier plans for this area he has succeeded in freeing himself from the sticky mess of engineering particulars and apparently irrevocable detailed considerations, and
he has cut through to the essentials. As we have all seen, once the main outlines of a solution emerge, what had earlier been regarded as obstructive elements drop into their true perspective. This distinctively architectural ability, the lack of which condemns so many purely engineering and administrative solutions of the "practical" planner, involves the introduction of new factors not present in the problem itself—in the case of planning, a new system of circulation, a new arrangement of land use, a new pattern of open and developed areas.

Current Projects
A review of the work in Aalto's 30-man office today (excluding inactive projects, competition efforts, similar work) shows an impressive volume at an unflagging creative level, a body of work international in scope, and, as throughout the architect's career, varied as to cost and purpose from the most practical architecture of industrial structures and housing to the most exalted of civic and cultural buildings. His concert hall for Helsinki forms one of the battery of cultural buildings Aalto has proposed on the shores of the Töölö inlet. Design is well advanced for what promises to be one of Aalto's greatest churches in Detmerode, Germany. A new library in the Lapland city of Rovaniemi, where Aalto's housing project for the National Housing Foundation has recently been completed, and the Seinäjoki library, forming part of the civic center, are both in the stage of final drawings. A large opera house for Essen, Germany, is under way, as is the Akademie der Kunst in Berlin. At the new university at Jyväskylä, the architect is adding a swimming hall to earlier academic buildings. The university museum opened last summer with the first retrospective exhibition of Aalto's work in a decade. At Ottaniemi, in suburban Helsinki, Aalto's earlier master plan for the Finnish Institute of Technology is now being translated into a series of building designs as construction starts on this long-deferred and badly needed university. Residual work is still being done on buildings under construction like a bank and office building in Helsinki, and such recently "completed" jobs as the 22-story apartment building for East German refugees in Bremen still being faced with tiles, and the Wolfsburg, Germany cultural center opened last fall.

From such a summary review it should be clear that Alvar Aalto is standing well the historic changes that have swept the post-war world, not least his native Finland where hydrofoil ferries now ply Lake Päijänne and traffic jams the streets of her once quiet and dignified capital city. The industrialization of building, the mechanization of life, the brutalization of large scale organization and autocracy—these to him are old enemies. While employing new tactics, the architect's entire life has been a long strategic encounter with these forces. It is the continuity with this effort we see in his work today.
Plan for Center of Helsinki

A new express highway parallel to the shore of the inlet, has been proposed by Aalto. Following the line of the existing rail approach, the highway will connect with large new parking areas covering the existing unsightly railroad yards. These garages will be covered with new shopping facilities. The diagram (left) shows the location of the cultural buildings planned for the site.
Eastern exposure. Brises soleil shield vast work and exhibition spaces

LE CORBUSIER

DESIGNS FOR HARVARD

Carpenter Center for the Visual Arts, the great architect’s first U. S. building, is less bold than could be expected and the beton is not so brut
Men and ideas are more important to Harvard than mere brick and mortar, as Harvard spokesmen will frequently assert, and the school has fought hard and successfully throughout its history to attract the most eminent men as teachers. When Harvard does consider brick and mortar, however, the same competitive demand for the best has made the University consistently hire the leading architects of the day. Today, the buildings by such men as Bulfinch and Richardson which grace the Yard are now joined by a gentle alien placed there by a surprisingly unassertive Le Corbusier.

Is it possible that Corbu designed an accommodating and modest visual arts center out of regard for the scale of the place? Harvard gave him a constricted site adjacent to Harvard Yard, tucked between the Fogg Museum with which the center has a functional relationship, and the Faculty Club, while tightly defined by two streets. Some of his other clients have given him somewhat more scope.
For its new capital the government of the Punjab set aside a great park north of Chandigarh extending in an unbroken sweep to the foothills of the Himalayas. The monks at La Tourette invited him to build on sloping farmland overlooking a forest near Lyon, and Ronchamp, as everyone knows, is on the top of a hill. The buildings which Corbu called forth for these sites are unforgettable in the power and strength of their images. Even when offered no scope at all as on the narrow suburban lots at Neuilly, near Paris, where he erected the famous Jaoul Houses from which much that is new in contemporary design has grown, Corbu achieved a vigor and raw boldness which he doesn’t attempt at Harvard.

The new building is attracting notice and interest, however, and the Harvard community finds it diverting enough. The visual arts are practiced in the somber recesses of the Fogg Museum or in Robinson Hall which shelters the Graduate School of Design. Certain basic design courses in what Harvard calls the Architectural Sciences will now be conducted in Carpenter Center, along with programs in graphic arts, photography, film and television. In its strategic location Corbu’s building is expected to give visually creative experiences a new prominence on the campus. A freshman who might never have thought of it may, at the sight of the new center, be moved to sign up for a beginning course called “Visual Composition,” which could lead to his becoming an architect, a landscape architect or a city planner; or possibly an educated layman who has learned to see.

In plan the new center looks like a cubist guitar from one of the master’s own still lifes. The curving perimeter wall asserts the building’s independence from its neighbors while at the same time it defines the intervening spaces in a subtle and skillful manner. The wall planes are continuous, slatted or deeply angled in precise relationship to the movement...
Curved element in foreground overhangs terrace partially screened by wall. Vertical slats admit light on north face but wall becomes continuous as it curves to the west. The directors studio workshop overlooks a planted terrace at the penthouse level, roof of curved foreground element will also be a terrace. *Brises soleil* are set at a 30 degree angle to screen the studio workshop from the late afternoon sun.

of the sun, while the round columns are of varying circumference, each expressing by its size the load it carries. The underside of each poured concrete slab is revealed, in deference to the Corbu edict that the undersurface of the slab shall not be violated, and where the slabs overhang the floors are exposed to cold underneath. The building is heated by means of an air floor laid between the structural slab and the finished concrete floor. According to engineer William Le Messurier, Corbu’s “modulor” called for a thicker dimension than structurally necessary for the slab, and the air floor took up the difference quite nicely. The bulk of the space is not air-conditioned. Exposed pipes are painted bright green and the fan units, noisily visible, take up space as casually as furniture. In the Le Corbusier esthetic columns are articulated from walls and little can be hidden or tucked away.

The great curvilinear bisecting ramp connects the heart of the structure to both streets, and from its center the main stair and the great exhibition space are clearly accessible from any point within. There is an intriguing interplay between Corbu’s interior and Georgian Harvard as perceived through the great panes of glass. Broad roof terraces which have been designed to carry a foot of earth for grass will, when planted, carry out the Le Corbusier dictum that the space which a building takes from the ground plane must be returned to nature at the building’s roof plane.

The art center had to be constructed on a tight budget within a grant given by the Carpenter family. Its cost was kept as low as $23 per square foot unequipped, and its entire cost was approximately $1,200,000 not including a subterranean addition to the Fogg.

It was an expensive building to engineer and to detail, however, according to Le Messurier. All cantilevers along the curving perimeters, for example, had to be designed to deflect the same, and long thin
Le Corbusier Designs for Harvard

Studio workshop on second floor. During the day, lighting in all studios is excellent, but at night the work surfaces are lit solely by reflected ceiling light which will be augmented in the future by individual desk lamps. Ceilings are painted white; other concrete is left in its natural finish for the most part and brilliant colors, selected by Corbu, are used as occasional accents. Spaces are undifferentiated and nothing is built in

Above: Ledge bridging brises soleil makes a handy display for the work of the students of Mirko, well-known sculptor on the Harvard faculty. The building is not yet fully occupied and some of the arrangements are temporary which may account for the flimsiness of the work tables in the photograph at the right. From inside one sees Harvard's redbrick buildings framed in all kinds of ways by the great glass panes..
columns have their complications. The office of Sert, Jackson and Gourley, which made the working drawings from preliminaries mailed to Cambridge from the Rue de Sevres, devoted long hours to devising the complex details essential to the realization of a work of art a la Le Corbusier. Corbu kept a tight control of the job throughout and permitted no basic changes in his design. A proposal by the collaborating architects to shrink the dimensions of the building by 5 per cent to better accommodate the budget, received a sharp veto from Paris. The concrete of the new structure has a smooth finish and a precision which is the opposite of the raw look which is the Corbu trademark, and is the result of expert concrete formwork on the part of the subcontractor. Brilliant accents of color are used with restraint on the exterior, but inside certain entire walls are painted a single strong color, carefully matched to Corbu’s specifications, contrasting dramatically with white ceilings and unpainted concrete surfaces.
Le Corbusier Designs for Harvard

Skylight illuminates an enclosed area on the fourth floor

All columns are freestanding, a Corbu principle, and interior partitions are movable
A COMMUNITY LIBRARY CENTER
Community Library Center, San Leandro, California
ARCHITECT: Francis Joseph McCarthy
STRUCTURAL ENGINEER: A. V. Saph Jr.
MECHANICAL AND ELECTRICAL ENGINEER: G. M. Simonson
LANDSCAPE ARCHITECT: Douglas Baylis
LIBRARY CONSULTANT: Coit Coolidge
CONTRACTOR: F. P. Lathrop Construction Company

GARDEN COURT FOR OUTDOOR READING
City Library, Santa Fe Springs, California
ARCHITECTS: William L. Pereira & Associates
STRUCTURAL ENGINEERS: Woodward, Tom & Associates
ELECTRICAL ENGINEERS: C. E. Mauk, F. E. Van Sickle
MECHANICAL ENGINEERS: Ehrishman & Konuk
LANDSCAPE ARCHITECT: Carter Von Herrick
CONTRACTOR: C. T. Smith

BRANCH LIBRARY AMONG RESIDENCES
Putterham Branch Library, Brookline, Massachusetts
ARCHITECTS: The Architects Collaborative
Jean B. Fletcher, partner in charge
Robert T. Eskridge, job captain
MECHANICAL ENGINEERS: Reardon & Turner
ELECTRICAL ENGINEERS: Maguire Engineers
GENERAL CONTRACTOR: Cardarelli Construction Company

FOR EXPANSION IN TWO STAGES
Public Library, Salinas, California
ARCHITECTS: Welton Becket & Associates
STRUCTURAL ENGINEERS: Stary & Skinner
CONTRACTOR: Tombleson & Huck

DESIGNED FOR LOW MAINTENANCE
South Branch, Public Library, Berkeley, California
ARCHITECT: John Hans Ostwald
GENERAL CONTRACTOR: Vila and Sons

LIBRARY WITH TWO FUNCTIONS
Township Public Library, West Bloomfield, Michigan
ARCHITECTS: Frederick Stickel Associates
STRUCTURAL ENGINEER: Clifford W. Holforty
MECHANICAL AND ELECTRICAL ENGINEER: Robert G. Caughey
LIBRARY PLANNING CONSULTANT: Robert M. Orr
CONTRACTOR: G. C. Waggoner & Sons, Inc.
A COMMUNITY LIBRARY CENTER

San Leandro Community Library Center
San Leandro, California
ARCHITECT: Francis Joseph McCarthy

This main library building for San Leandro, a rapidly-growing city on the east side of San Francisco Bay, is more than a repository of books. Its formal name gives a clue to the library's many-sided program of activities: a "community library center." The building not only provides for an ultimate book capacity of 120,000 volumes but also for a full range of community activities—civic, educational and cultural. A lecture hall, meeting and conference rooms, and a painting, sculpture and crafts studio with its own court, are available for use by the public. All but two of these facilities (the two smallest) can be used independently of the library proper. The plan is organized around two garden courts—one for children, opening off the children's room and giving daylight to it and to the corridor along the wall of the lecture hall where exhibits are hung; and the other in the adult reading area. These sunny, protected outdoor areas bring daylight into the building interior and add color and informality to the reading areas without sacrificing the convenience of good relationship between various areas and services. On the second floor, in addition to the librarian's offices, staff offices and lounge, and a special collection on California history, there is space for expansion as the library grows.
GARDEN COURT FOR OUTDOOR READING

Santa Fe Springs City Library
Santa Fe Springs, California
ARCHITECTS: William L. Pereira & Associates

This inviting library is the first building to be completed in a group which will become the town center for Santa Fe Springs, a relatively new town in Southern California. Eventually the center will include civic, commercial, recreational and residential buildings in a park-like setting from which vehicular traffic will be excluded. The library plan is entirely open except for the music, work and staff rooms. An unusual and pleasant feature of the building is the garden court at the rear of the building, usable during most of the year as an outdoor reading room because of the area’s mild climate. The lounge with its large fireplace, opening off the general reading area and connecting directly with the garden court, is another unusual provision. Although the materials used for walls and column facings are simple—concrete block and precast concrete units—the overall effect is one of richness and texture. Entrance is by a bridge over a reflecting pool almost as long as the building front.
BRANCH LIBRARY
AMONG RESIDENCES

Putterham Branch Library
Brookline, Massachusetts
ARCHITECTS: The Architects Collaborative

Related visually in scale and material to the residential neighborhood in which it is located, this branch library nevertheless expresses its public function. Red brick is the predominant material used, with natural concrete for the canopy over the entrance and for the fascia. A special feature of the single, large, high-ceilinged space which encloses the reading rooms is the alcoves along two walls of the room. Low furniture groupings, oriented to these alcoves, differentiate between adult and children's reading rooms and periodicals area, giving an unusually open feeling to the room. On one side the wall is all glass, except where interrupted by the alcoves, providing daylight and an outlook on graveled terraces and low planting along the steep slopes at the rear of the site. The control desk is at one end of the room, near the entrance. A decorative wood screen separates the children's room from this entrance area. At either end of the reading room are low, brick-walled elements, one containing a music room and staff work room, the other containing a 100-seat meeting room which can be used independently for functions not related to the library. A stepped terrace is to be developed off this room.
FOR EXPANSION IN TWO STAGES

Salinas Public Library
Salinas, California
ARCHITECTS: Welton Becket & Associates

This library, the second building to be completed in the Salinas civic center, was designed not only to blend with the first building but to permit expansion in two stages to an ultimate doubling of capacity. The three wings of the present plan, controlled by the centrally located desk, would remain, the expansion taking place in the general reading area, enlarging the stack space and, in the last stage, the work room as well. A special feature is the browsing lounge which overlooks a paved and landscaped court with a reflecting pool and fountain. Beyond the court is a meeting room, available for community groups. The building cost $250,000, somewhat less than the city's budget for it.

DESIGNED FOR LOW MAINTENANCE

South Branch, Berkeley Public Library
South Berkeley, California
ARCHITECT: John Hans Ostwald

All materials used in this branch library were selected for their ease of maintenance as well as because they were appropriate to the building and its very tight budget ($60,000). Walls are of concrete block, integrally colored and exposed inside and out. The same block, turned on edge with the openings filled with amber glass, is used for trim. The roof of the adult reading room, which rises to a height of 16 feet, is crowned by a skylight which is a source for both daylighting and indirect artificial lighting. The ceiling of this room is surfaced with hemlock boards. Elsewhere ceilings are of acoustical plaster. The children's room opens directly into a small landscaped courtyard for outdoor reading or story hour programs in good weather.
LIBRARY WITH TWO FUNCTIONS

West Bloomfield Township Public Library
West Bloomfield, Michigan
ARCHITECTS: Frederick Stickel Associates

Located in a new and fast-growing suburb of Detroit, this building not only meets the normal requirements of a library but also provides a place for civic and social gatherings, a facility which the town has not yet built. Both functions are provided on the same level, with mechanical equipment on the lower level. Since the reading room relies on artificial lighting, its walls are solid for the most part; in contrast, the lounge-meeting room is more open, with one wall entirely of glass to take advantage of a fine view to the south. This room has an outside entrance for use independent of the library, but is accessible also through the library.
A LESSON IN UNITY

Rose Art Museum
Brandeis University
Waltham, Massachusetts

ARCHITECTS:
Harrison & Abramovitz

STRUCTURAL ENGINEERS:
Linenthal & Becker

MECHANICAL AND ELECTRICAL ENGINEERS:
Jaros, Baum & Bolles

INTERIORS:
Alice Tiebout Interiors

GENERAL CONTRACTOR:
George B. H. Macomber Company

Brandeis University's first building devoted solely to the housing and display of art offers visitors a stunning example of architectural unity; a compelling lesson in how a two-level building can be designed to give the effect of a single space containing an incidental floor. Visually, a strong vertical movement is set up by the successive effects of central skylight, open well, cantilevered stair and pool. But interior space moves laterally as well, since each level opens freely to the central verticality. The total effect is dramatic, and provides the further advantage that the visitor can—from any point—readily orient himself. Architect Max Abramovitz points out that the design seeks to avoid the feeling of being shut away in a series of separated exhibit spaces, in deference to the quality of openness and a sense of more to see. The museum is a gift of Mr. and Mrs. Edward Rose of Boston, and houses their valuable collection of rare china and small art objects, as well as the University's collection.
As the plans reveal, the upper level is set within a terrace for sculpture, while the lower level has a portion of its space devoted to wash rooms, office, storage and work areas. The entire building is air-conditioned, with specified humidity control to insure maximum protection for art treasures. The foot-deep pool of circulating water has a marble curb, a bottom of gray-black pebbles, and yields sufficient income from coin tossers to pay for its occasional cleaning!
The photo (top) shows how the Rose collection is displayed in six cases of natural walnut flanking the central open well. In addition to the flood of daylight from overhead, the cases are illuminated by built-in quartz lamps. Peripheral walls on this level are washed by diffuse light angled from concealed troffers (bottom). This basic lighting is supplemented by a pattern of downlights for maximum control. All woodwork is unfinished walnut; the floor is beige travertine; walls and ceilings are white plaster. The structural frame is concrete.
The Training and Education of Architects

By William Allen, A.R.I.B.A.*

Architectural education has found its way to much the same form all over the English-speaking world. There is generally a five-year curriculum which embodies a substantial amount of training in the studio. It is designed to produce general practitioners and it produces other types only seldom and largely by chance. There is little postgraduate study or research, but we lay down a requirement for postgraduate practical experience before qualification.

The unusual feature here is the training, the studio work. You may be surprised that I call it “unusual” because, of course, to us it is the most natural thing in the world—so natural that we hardly ever question it, at least in principle; sometimes we get worked up about detail. However, outside observers are sometimes puzzled by it, especially when they note that some of the professions apparently closely allied to our own do not incorporate much, if any, training with their education. I’ve no doubt they wonder whether we have ourselves looked sufficiently critically at this part of our system and quite frankly I do not think we have. Let me therefore take a glance at it now.

What do we use it for?

The short answer is, to acquire skill. A professional person, let me remind you, is a person who professes skill in the application of some body of knowledge. Skill is not the same thing as knowledge and we want to be quite clear what the difference is because our whole education system depends on it. We can get knowledge from books, from lectures, from experience and from all the sources you know as well as I; but skill implies an ability to do something with this knowledge which requires dexterity, balance and judgment, and a capacity to make decisions. One can be very knowledgeable, therefore, without being at all skillful. And I think the implication of this is quite clear, that a professional person must acquire both skill and knowledge; and increasingly today he is made responsible in law for possessing them before he offers his services. It is this which particularly distinguishes fully professional people from scientists, historians, men of letters and others of that ilk who seldom have statutory or implied responsibilities of this kind.

The question, then, is not whether an architect shall acquire skill, but how and when. We have fallen into the practice of cultivating it in parallel with our formal education. The medical profession meets the problem in much the same way except that it tends to concentrate its training in an end-to-end arrangement late in the curriculum, which, incidentally, takes the same total time as ours. I understand it is now moving towards the parallel arrangement. Most other professions except law, which is too confused to be easily summarized, and music, which has no statutory responsibilities, seem to have presumed that the prequalification period of practical experience is for this purpose.

A question that springs to mind at once is the relative merit of the parallel and end-to-end arrangements.

I think one answer to this arises from our particular needs. Most architectural students when they begin have had no previous sensitizing to visual matters and little, if any, art training, a weakness of our secondary education that has for us the sole advantage that few prejudices have been formed. We assume we start from zero, therefore, and our first problems are to teach the use of the hands to make meaningful marks on paper, and to cultivate an ability to envisage and express on paper related enclosures of space, knowing in particular how they will satisfy use by people. By the end of the first year at the A.A., as in most schools, the student is generally expected to have enough knowledge and skill to design a simple building, and it is generally possible to detect at this stage any people really without capacity to develop skill as an architect.

From this time forward studio work in most schools is chiefly characterized by design projects graduated roughly in complexity and different enough to give exercise in different kinds of problems. These are criticized by studio tutors and lecturing staffs as they develop, and then by major juries including outside practitioners and acting clients. The student accumulates a portfolio on which in this country external examiners pass judgment at the third and fifth years.

This is familiar to most of you, but it tells us little of the real nature of design as a process, and it is this which must be understood if one is to comprehend what training is really for. If you dissect the design process in the finest detail, as a scientist explores the smallest particles in order to understand nature as a whole, it will be found that what is being

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* Excerpts from a recent paper by the author, who is principal of the Architectural Association School of Architecture, London, England
cultivated is an intimately alternating process of imagination and analysis. To put it very briefly and crudely, you first get the problem in your mind and try to identify its critical aspects. The imagination—a remarkable bit of mental machinery that can integrate several variables at once into a single concept and thus make design possible—goes into action, lines go on paper to fix the concept, and then the imagination rests for a moment and analysis takes place. Faults and new possibilities are seen and the imagination takes over again, and so on, the process repeating continuously, to modify and extend the ideas. At first only simple concepts can be handled and only slowly, but with experience the process becomes mainly automatic and subconscious. Skill is developing.

The imagination acts intuitively, without reasoning but not without guidance. The kinds of things it formulates are the result of one's purpose and one's capacity to analyze and criticize constructively. This is the source of its guidance. The analytical faculty thus becomes, as I see it, the instrument of one's taste, one's judgment, one's set of values and ethics, and one's knowledge. We cannot create imaginative genius in schools, but we can cultivate imaginative skill by training, and we can develop analysis by education and observation. This is the microcosm of our method and intention.

Now why have I taken so much time to discuss and dissect something that is never seriously questioned in the profession anyway? To your born researcher that would itself be a good enough reason, of course, but it is not what I had in mind. The real and much more serious reason is that a long, hard look is being taken at higher education in Britain today—the Robbins Committee is its spearpoint—and an equally searching look will have to be taken at individual branches of learning by those responsible for them. If something has become a habit rather than a necessity, it should be questioned; if something is exceptionally good it perhaps ought to be recommended to others. Our studio curriculum occupies a lot of time and it is not something that is found similarly developed in any other profession; what view should we take of it?

I do not think there is any doubt that the great majority of architects would agree that what we have is a very good thing, at least in principle. If we were deprived of it by some imaginary but quite possible administrative stroke that produced, for example, one of the evident alternatives, a shorter formal education with the training left to offices, I think we would all expect a drop at once to much lower standards both of architecture and of professionalism. The links between education and design would be severed in time and space, and organized development of design skill under criticism would largely collapse. I do not think anyone would like the result, or find it to the national or personal advantage.

There is, then, the other side of the argument; if we think it sound for us, do we think it should be advocated to others? Most of us have not thought much about this, but it interests me a great deal and I would like to make one or two remarks about it.

First, as a matter of principle it seems to me that professional education generally should be viewed as a category in which the cultivation of skill is a part of the system, to be carried out in an integrated manner alongside the formal education.

I doubt if there is an equivalent need either in the sciences or the arts subjects, and therefore it follows for me that we should perhaps visualize that professional education ought to be longer than those others for the same intellectual levels. I think the incorporation of training could add very valuably to the level and power of professional skill.

My second remark is that so far as our leadership of the building industry is concerned, one of our major problems is that the professions most closely associated with us do not strongly cultivate either a design skill, in the sense in which I have used that phrase, nor a similar social ethos, nor similar working methods. All of these are or should be part and parcel of professional training, and if the country is to be given the service to which it is entitled from its largest spending group of professions, we will have to have a much more consistent educational technique amongst us. Let me in passing commend at least two of these professions which have achieved most heartening developments of outlook in the past five years: the quantity surveyors and the structural designers. The results are very evident and comforting to us.

And my final remark in support of training for professions is this. At the very least it develops organizational thinking, by which I mean the capacity to face a very complex set of factors and resolve them together into a system of some kind which is not merely a set of compromises, but one in which all parts work together in an optimum manner; and at its best it transcends this commonplace. Whatever we make or build that forms part of our visual environment affects people's feelings and spirits, quite regardless of whether we deliberately intend to affect them or not, and it is wasteful, as well as terribly wrong, to ignore the study of this in educational systems. By wrong I mean morally wrong; and here you see emerging an aspect of architectural outlook that is one of our least discussed but most deeply ingrained feelings, that professional life of almost any kind is a service to society and is to be inculcated throughout as such. Professions must be socially conscious; few are.

But I am straying now too far towards the edge of my subject and must return. I have said quite a lot in praise of our studio training in principle, and I wish I could extol the detail, but here I have some misgivings, not about the A.A., which in many ways
is exceptionally fortunate, but about our general practice in schools. I am, of course, too new to do more than cast a suspicious glance here or there. Could we look in particular for a moment at our studio program itself?

There was a time when the ideal of this was to cover all the main types of design and forms of construction. The objective was, on the face of it, commendable and it has left its mark upon us in the pricks from our conscience when we drop some time-hallowed item. But was it ever sensible or even possible? Was it, I wonder, the real origin of our five-year curriculum? Whatever the truth of this, I think today we may still have too large a variety of similar things, if you will forgive the Irishism. We seem to have quite a number of building types studied at much the same sort of depth, and the danger is that we end up knowing too little about too much, and perhaps never feeling the sense of perspective, security and authority you get from knowing how deep you have to go to obtain real understanding. It is the unknown that most of us fear.

I am not going to take you through a catalog of possible studio objectives, but I would like to identify one question that crosses my mind time and again; do we sufficiently experience thoroughness? You will note the distinction implied here between comprehensiveness, about which I have just expressed suspicion, and “thoroughness.” We cannot be thorough in the sense of being comprehensive, but I believe we can and ought to know thoroughness as an experience. Our chief educational problem is not to stuff people full of facts of immediate usefulness, but to reveal to them the depth of architecture in its modern context, to equip them to comprehend deeply what they look at, whether it is their own work or the work of others; and above all how to penetrate new problems and come to reliable conclusions. A set of values and a kit of tools, embodied in an outlook and a method of attack: this is another way to state our problem in training. We would all subscribe to this; my fear is that too few of us have the courage to face its implications in education.

One unexpected risk attends the development of thoroughness. Preparatory study for a design can become a fascination in itself to the point where one begins to believe there is always more to be known, and decisions become difficult to take. Sometimes, in fact, this can almost totally inhibit design. The danger is perhaps especially near the surface at present when life is full of experimental work, and it reveals a facet of the handling of science in architecture which relates the art-science tension intimately and in a surprising way to education.

The Development of Analysis

Now, I have said quite a lot about our methods of developing skill but nothing about the educational content of the curriculum where we acquire much of our basis of analysis. We depend upon our imagination to do design, but imagination itself depends upon the terms of reference we give to it, and these are largely developed in our formal education. If this is well-balanced and penetrating, well and good; if it is lopsided or has big gaps in it, our design will reflect this.

What about our formal education then? Is it of the right sort, and has it got in it what we need? Looking at the situation generally, I confess I am not very thrilled.

I could perhaps document this by pricking holes in what we do at present, but instead I am going to describe roughly the kind of pattern I think we ought to have, and see where that leads us.

The first element in my pattern would be the study of people, as individuals and as groups.

As individuals they chiefly are of concern to us as sensory systems, for in these lie not only the fundamental and constant determinants of human comfort and convenience, but also the whole of the emotional response characteristics to which the highest practice of our art is directed; it is not merely what kind of environment gives comfort, but what gives delight, or moves us deeply in some way.

As groups the collective behaviors of people and their needs are our constant concern as the basis of planning. Families, crowds, meetings and movement, pleasures and necessities in everything from one-room flats to whole cities, these are our responsibilities. At once for this purpose we reach towards such studies as psychology, philosophy, sociology, economics, and flow systems.

An entirely different part of the pattern concerns the technique of building. Structural design, construction, materials, equipment, the prediction and control of cost, the problems of building organization and craftsmanship—all these (and perhaps one or two I have forgotten) form the substance of our technology.

An important element in our scheme of things is communications, by which I mean the flow and movement of vehicles, of people, of power, of liquids, gases, of wastes and production. They have important similarities which are causing us to teach them in future as a group at the A.A., but regardless of how they are handled, they provide on the one hand part of the theory of planning and on the other an important element in technology.

History has always been dear to us, not so much because it is a generally civilized study as because it exemplifies the way in which our raw material has been processed together by the minds of earlier designers to make architecture. Then, too, it shows us totality, for which we are always striving, so that those qualities which we cannot yet formally explain and teach in a fully reasoned manner may yet become apparent: scale, for example, or rhythm and texture and character. In this sense it has been
perhaps a better insurance against our other educational deficiencies than we realized. Of course, above all else it documents for us the manner in which our art becomes the physical embodiment of society's outlook and character.

My list concludes with the professional material which is our introduction to law, management and the ethics of practice, a group which now will have a heightened importance as we enter a phase of history when our productivity will have to take a great leap forward and society has become claims-conscious, aware of its rights and our duties.

There are several studies, such as landscape and civic design, that perhaps do not seem to have a place in my pattern, but I am only concerned here with a rough outline and will not delay to fit them in. Others, such as lighting and acoustics, have not disappeared from my picture but are divided up among the groups I have mentioned.

Now, any architectural educationalist can look at my outline and, if it is as comprehensive as I hope, he could pick holes in existing curricula. This, however, is not the use which I want to make of it, for it reveals to me two problems of far deeper concern to which I want to draw attention.

The first is this, that the subjects themselves have to be formed in almost every case by combining borrowings from several other fields of learning and specially processing them for our use.

Take structures, for example. Structural design is a well-known branch of engineering, yet in its native form it is not very satisfactory for us, as any structural engineer who has taught architects will tell you. What we are chiefly concerned with are structural systems, understood as such, and not so much in a computational sense as in form. "Strength through shape" would be a way of summing up part of this concept; but in addition we have to see these systems in terms of economics and build-ability for the kind of design problem confronting us. We do, in fact, also require computational skill up to a point, but this is not our main problem.

Now, some may say that you cannot understand structure without considerable mathematics. If we admit this we admit something which goes against much evidence of recent years. What I would suggest is that if you have mathematical ability you may be able to understand structures in one way and to a relatively advanced level; but if you are not mathematical—and many good architects are not—I think we have to believe it can be taught successfully in another way less dependent upon numbers. The fact is that collaboration in recent years between architects and sympathetic, imaginative structural engineers is yielding real advance towards mastery of structural form on both sides, without any improvement in architects' mathematics at all. To a large extent we seem to act and learn by forming conceptual models.

I believe we have lacked the courage of our convictions as a profession in this matter. We have taken a really disproportionate part of our education time and effort to get as near to engineering computational standards as we can, and the going is so hard that many of us miss these by quite a long way—and also miss the opportunity to make a truly architectural study of structure. In some ways numbers can get in the way of ideas, which are the things we really want to produce. It may be interesting to report that we give here about 135 hours of tuition in structures, comparable with the lecture curriculum of good engineering schools, but we cannot pretend to produce structural engineers, even with students of comparable mathematical standing to begin with and excellent teachers. We must take a fresh look at this subject.

Another problem revealed in my rough outline of a curriculum is our long-established duet of construction and materials.

Both of these are combinations of crafts, sciences and technologies. They are vital to our education, but even so it has been a great struggle to get them geared up to anything like reasonable levels. Once again it is our predicament that neither subject is an academic discipline which we can lift straight from somewhere else, and only recently have we begun to feel less lonely about them, as advanced studies of building have begun to develop in colleges, and to experience similar needs. Even so there are differences between designers and constructors that make for big differences in the courses.

Take finally a third subject, this question of the individual as a sensory system. All sorts of people study him, neurologists, physiologists, psychologists, even physicists and chemists. Most of them, in true scientific fashion, study some special aspect only; few look at the whole of one sector, and even fewer are concerned with the whole man as a perception mechanism, which is our interest. Pity the poor teacher of architects! How is he to build up a course of relevance and quality in a subject like this?

I could add the remainder of the courses to the catalog, with perhaps the exception of history, but these will serve my purpose, which is simply this: to assert as clearly as I can that almost throughout the variety of subject matter which we properly should have in our curriculum, there is to be found no major subject which we can take directly from any other field of study at present; and that we therefore cannot expect to find either courses or ready-made teaching staffs in reasonable numbers and high quality. We have lived too long without facing up to the implications of this fact of life, and until we do so, we will not get down to lifting ourselves by our own boot straps, which is precisely what we have to do if we are to get our education geared up to the kind of level we know to be possible and necessary.
A LOT OF LIVING SPACE ON A PRECIPITOUS SITE

Rockrise and Watson fit a big house on an almost nonexistent building plot.
Residence for Mr. & Mrs. Merrill Matzinger
Belvedere, California

ARCHITECTS: Rockrise and Watson
ENGINEERS: Gilbert, Forsberg, Diekmann & Schmidt
CONTRACTOR: Charles J. Hendrickson
LANDSCAPE ARCHITECTS:
Lawrence Halprin & Associates
INTERIOR DESIGNERS: Dovee Kerr Associates
A remarkable amount of ingenuity was used to reconcile the program for this handsome spacious house with the tiny, steep building space available.

The site was chosen for its spectacular views of Golden Gate, Sausalito and Mt. Tamalpais—and for its location on Belvedere Island, a beautiful little neck of land, heavily wooded, which juts out from the Marin County side of San Francisco Bay. Little "buildable" flat land is left in this section. This plot had a 300-foot frontage on the bay, and a very small projecting knoll about 35 feet across, which drops 60 feet to the beach line. The balance of the site is simply a steep bank, an existing private road cut into the wooded cliff face, and a small cove with a little beach below a wooded grove.

The program, as can be noted from the plan, required very ample living spaces (indoors and out) plus a bedroom-study suite for the parents, separate childrens' bedrooms which could be closed off when they are away, and separate servants' quarters to be occupied by a caretaker if the family is away.

The final plan is a three-level scheme, which gains space by placing the living room and its surrounding deck on wood struts over the water—high to capture the entire view. Next to this, the crown of the knoll was lowered to provide a 600-square-foot patio on grade, which connects with all major rooms via balconies. Bedrooms for children and servants are on the middle level, and at the lowest level is a cabana for entertaining near the little beach. Parking is provided in a widened section of the private drive, and in a graveled section of the grove.
The surprising amount of outdoor living space in the Matzinger house, considering the sharp fall of the site, can be noted in these photos. _Top:_ A little terrace and garden give a pleasant entrance. _Center:_ The photo shows the variety of balconies and terraces on the three levels. _Bottom:_ The large patio opens off the major living rooms.

The house is wood frame on concrete foundations. The exterior is redwood and stucco, with a heavy aggregate roof over the flat portions, shingles over the peaked living room. Main rooms have walls of clear hemlock paneling, floors of quarry tile. The rest of the house is finished in gypsum board, with carpeted or vinyl tile floors. The heating system is a gas-fired, warm-air, perimeter one with three furnaces.
OFFICE BUILDINGS

Here and there in many outlying towns and villages, some seemingly new kinds of office buildings are appearing. The Michigan Bell Telephone complex (page 184) and McGraw-Hill's Hightstown buildings (page 189) represent one of these new types. Both were built to house extensive, relocated, clerical and other "paper work" operations which their owners found to be relatively independent of their former urban locations. Diversity in their design, of course, reflects architectural solutions to two different programs for two different sites. They are, nevertheless, one kind of relocation.

Another kind of ex-urban office structure is represented by American Airlines Data Processing Center (page 194). Here, all reservations and loadings for all scheduled flights of the line's entire network are handled by a battery of machines fed by wires and supervised by a relatively small staff. Similar centers handle such massive tabulating and sorting tasks as credit card billings or (see page 198) telegraphed florists' deliveries. This type is relatively independent of location. Many data centers are, of course, in cities. But they are finding increasing welcome as congenial taxpayers in outlying towns. A data processing center of very large capacity can be housed in compact quarters. The American Airlines center, one of the largest one-company computer centers in the country, has a machine room of only 7,000 square feet in a total building floor area of 20,000 square feet.

Still a third out-of-the-city office type is being located in industrial parks throughout the nation. Some of these, such as the Facit offices (page 196) are quite conventional in program and serve as national, division or distribution headquarters. Others, such as U. S. Steel's Engineering building in Monroeville, Pennsylvania (page 182), house a variety of special office functions which may or may not be limited to serving the operations of nearby manufacturing or research establishments.

All of these out-of-town types have one motivation in common: economics. As their parent companies grow into increasing space requirements while urban values spiral, certain changes in outlying conditions are making these new types feasible and logical. Business operations which do not require the physical convergence in cities of diverse specialized personnel are following an increasing supply of reliable clerical help well fortified by supervisory and other specialists who are willing, in fact eager, to forego the contact advantages of commutation to the city. To the obvious real estate and tax advantages of country location, three maturing technical developments add their weight to executive decisions to move at least some of their operations out of town: the automobile and its associated highways; the computer, with its labor-saving, wire-connected independence; and the telephone, offering new, wide-area, fixed-fee services and data-phone devices for transmission of "machine talk" from one computer to another. A telephone executive predicts that this data load will one day exceed the voice load.

This new freedom of location has, indeed, induced some spectacular relocations of corporate headquarters such as those of General Foods and I.B.M. (page 182). But these instances by no means establish any mass exodus of corporations from city office space. The Real Estate Board of New York, surveying "the largest commercial construction program in human history" in New York City, reports that 99 per cent of post-war completed office space is occupied. The giant Pan Am Building was 86 per cent rented three months before its completion date. The urban office building boom is nationwide and includes such first class rental space as the First Federal Building in Detroit (page 202) and corporate skyscrapers like New York's Union Carbide and Chase Manhattan buildings and Humble Oil's "tallest building west of Chicago" in Houston.

A survey of 74 office buildings constructed in the last five years by 22 of the nation's largest industrial corporations, reported on the following two pages, shows all of the diversity mentioned above—and two-thirds of those buildings are in cities.

The trend, then, if there is one, seems likely to be toward flexibility of urban office spaces for tenant and executive occupancy, but without the huge, uncuttable expanses for clerical occupancy.
A SAMPLING OF OFFICE BUILDINGS FOR INDUSTRY

Buildings shown above and opposite are a sampling of the kinds of separate office structures (not attached to manufacturing plants or warehouses) represented by current building activity of large industrial firms. New corporate headquarters, regional offices, data centers, and specialized office buildings are extremely diverse in site location and in financial arrangements for ownership or leasing.

To spot any evidence of trends toward new kinds of offices or new site criteria, a survey was made of the largest U. S. industrial firms (in terms of 1961 net sales). Elicited comments show that hard economics and inherent business differences determine the variety in office building programs and locations. While no statistical extrapolation is warranted from the sample taken, a tally of the 74 new occupancies reported by 22 firms show some interesting distributions: 34 were corporate or division headquarters, the other 40 were for special functions; 61 were occupant-owned; 49 were built in cities.
Rocketdyne Division of North American Aviation will occupy this 60,000 square foot headquarters by Kenneth Neptune, 1963, built next to R.D. plants in Canoga Park, California.

Bethlehem Steel's Seattle office building by Bindon & Wright, 1960, is one of four such regional city offices (another is at right, center) built since 1959 in urban business centers.

Continental Can is major tenant of this New York high-rise by Harrison & Abramovitz, 1961, owned by realtors.

Bethlehem Steel's own downtown San Francisco offices by Welton Becket, 1959, has 13 floors, no inside columns.

Western Electric's 31-story glazed brick home by Shreve, Lamb & Harmon is near parent AT&T in New York City.

R.C.A. will lease four floors (42,000 square feet) of this Hollywood building by Albert C. Martin & Associates, 1963, for new Victor Record Division studios, offices and data processing.
The building program of the Michigan Bell Telephone Company included centralization of four basic office functions on a 41-acre suburban site. The four operations to be relocated were: Detroit Disbursements Accounting, the Woodward Division office, Engineering, and Telephone Directory. The company had decided on the move to consolidate operations and to take advantage of lower land costs and lower taxes. The site was purchased in a developing residential area where high quality clerical personnel would be available.

The order of construction was not fixed at the beginning of the project except that the Detroit Disbursements Accounting Building was to be the first ready for occupancy. Space requirements for this building had already been determined including functional relationships between various areas and a 16- by 24-foot bay size which had proved suitable to similar functions in the client's Port Huron Accounting Building completed a year previously. The determination of these criteria, and the zoning restriction at the site stipulating the maximum height of 35 feet above grade, resulted in a three-level building, 480 by 96 feet in plan. Functional relationships established that the main building entrance would have to be more or less central in the long side. This seemingly small detail played a major
part in development of the various buildings on the site.

Although 41 acres seemed a generous allotment for the project, it was determined that state highway easements would require about five acres, township zoning setbacks would prohibit building on about 10 acres, and the client's reserve for future development or sale eliminated about seven acres at the east end of the site. All of these deductions reduced the area available for actual buildings to about 20 acres. Other site restrictions, in addition to a maximum height of 35 feet above grade, included a usable floor area not to exceed 40 per cent of the land occupied and a parking ordinance requiring \( \frac{1}{2} \) square feet of parking area to one square foot of usable floor space.

The site itself was practically level with a surface swamp in the middle, no storm or sanitary sewers, and a water table following from 1 to 6 feet below natural grade. A sanitary sewer was installed before the first building was occupied. Drainage ditches were put in along north and south property lines with head walls at the west end to allow slow run-off. The center of the site was filled to a depth of \( 3\frac{1}{2} \) feet. And, since windows would be needed in some basement areas, buildings were raised so that the maximum ordinance height above grade would be achieved.

Construction program and dissimilar occupancies more or less dictated three buildings similar in shape and one building considerably smaller to house certain common services such as cafeteria, medical department and employment office. Since the Disbursements Accounting Building was to be the first constructed, its basement was assigned to as many as possible of the project's central mechanical facilities including boiler room, primary switchgear, shipping and receiving, maintenance shops, etc.

The ultimate plan was developed as four large masses of office buildings (three are now in place with mall space for a future fourth) grouped around
Western facade of service center (right)

Engineering building
and connected by enclosed bridges to the smaller service center building. The large buildings were designed to be almost identical in appearance and to contrast sharply with the more freely designed service center. This was done to assure a pleasing composition regardless of the order of construction. Two large reflecting pools flanking the service center enhance the mall and serve as a storm water control element.

The office buildings are of window wall exterior set on recessed bases of colorful glazed brick. Framing is structural steel and reinforced concrete. Span-drels are porcelain enamel and glass. Interior walls are painted steel and block. Floors are concrete over cellular steel deck finished with asphalt or vinyl tile. Ceilings are lay-in grid system. Windows are \( \frac{3}{4} \)-inch gray plate glass.

Treatment of the service center was varied both visually and structurally. White fascia and mullions of the upper, cafeteria floor overhang a columned walkway around the recessed main floor which contains reception, employment and medical areas. A lower level houses kitchen and storage areas.

Pyramidal shapes of the three-dimensional ceiling of the upper level reflect actual roof construction of 24 inverted pyramids supported by single columns at each vertex. Top tension ribs form a system of air supply ducts as well as lateral bracings. Columns contain roof drain pipes with heating devices to prevent freezing.

Elevated, glass-enclosed bridges connecting all buildings to the upper level of the service center consist of paired parallel vierendeel trusses with metal roof deck resting on the top cords and a 4-inch concrete floor resting on the bottom cords. Bridges ride freely on \( Y \) columns set on 42-foot centers. The 500-foot bridges are anchored at the center \( Y \) columns to allow free movement on lubrite bronze shoes toward each end.

Landscaping was designed as a central mall with various centers of interest within the discipline of a concrete grid of walkways. These centers are in the form of terraces where small groups can sit and converse or eat luncheon in pleasant weather.
Office Buildings: Michigan Bell

Service center building at the Michigan Bell complex is a three-level structure, approximately square in plan. Main level is entered from the mall and contains visitors' lobby (below) with access to employment and medical offices to the north and various service and conference rooms to the east. Large open space at the northeast is now used as a drafting room. Lower level contains mechanical rooms and a kitchen which serves, via dumb waiters and elevators, a cafeteria on the glass-walled upper level. View (at bottom) shows pyramidal roof structure expressed in ceiling of the upper level. Enclosed bridges give access to this level from three office buildings.
When McGraw-Hill faced the need for a new office building several years ago, many firms with large offices were blithely announcing plans to move to the country, where the grass was obviously greener. Some of them did forsake the city, building great horizontal office buildings in parklike surroundings. Others studied the idea carefully, decided that the city had advantages not to be sacrificed, and built new buildings in downtown locations.

The new Hightstown office buildings of McGraw-Hill represent a studied answer to such a problem, one which realizes the advantages of both alternatives. The question of country vs. city was broken down into specifics—who and what should be in the city, who and what in the outlying community. The resolution suggests a concept of office arrangement which might have important effects on building design, either in or out of the city.

The Hightstown buildings are not in the suburban pattern. Hightstown is 49 miles from New York and 47 miles from Philadelphia. The area was first chosen as a distribution and warehouse center for McGraw-Hill's huge book operation. Employees were largely recruited locally; there was never any thought of extensive commuting by anybody.

Further analysis indicated that such a location was also good for many of the clerical and data
The extent and thoroughness of the use and space studies that preceded the design of the McGraw-Hill Hightstown buildings are indicated by the forms shown here. The average daily activity form (above) helped establish quantitative data on the volume and flow of departmental contacts, communications and materials. In this way, relative locations of departments and activities were established. From analysis of these forms and other data, functional diagrams, such as that on the left, were prepared.

The space allocation and layout form (below) was used for study of desk arrangements and the finer details of space planning. An important principle of the final space planning decisions was the establishment of a 5- by 6-foot, one-desk module. Expansion is built-in, as shown by the diagram. At first desks are spaced with one-module aisles between, as shown in the left portion of the diagram. As a department grows, desks are arranged in pairs, with one-module aisles between pairs. Such diagrams were extremely useful during study of the building planning and have continued to be useful as tools for rearrangement of spaces as needs occur.
processing operations of a large organization, especially since computers and modern communications systems pointed toward outlying centers. Indeed a real trend in this direction is noted elsewhere in this study.

The occupancy of the midtown building—the famous green one designed by Raymond Hood in the thirties—is shifting gradually, as the move is accomplished, to greater concentration on the activities and personnel which do need the bustle and contacts of the downtown city. Company executives, editors and salesmen cannot operate at full effectiveness in country isolation. Many of the companies which did move out in the earlier suburban exodus discovered, as Lewis Mumford reminds us, that the pace, stimulation and facilities of the city are necessary to most operations of modern business or science. So McGraw-Hill's midtown building is changing in use and concept.

Perhaps the McGraw-Hill experience suggests that the design of expensive downtown buildings will focus more on individual office spaces and less on large bull-pen or punch card areas. The design of the Hightstown offices is based on the opposite principle. Since the people who occupy the buildings are mostly involved in clerical work and machine operations, there are few private offices. Interior spaces are large and open, with only a minimum number of partitions.

In the late fifties, a company committee, with the aid of management consultants—and later the architects—began the studies that eventually led to relocation of some McGraw-Hill operations at Hightstown. The operating heads of all divisions of the company were also involved in the studies. Beryl Robichaud, a McGraw-Hill vice president, who is experienced in office space planning, took charge of relocation, and followed the project through from inception to completed buildings.
The major elements of the plan are the west building (left) housing operating departments, and the east building (right) containing data processing and service facilities. From parking lots near each major department, employees enter the building through side doors near their working positions. Departmental storage rooms and employee coat areas and toilets are conveniently located in service cores of each building. A partial basement and penthouses contain mechanical, electrical equipment.

The structure is steel frame, with precast, exposed quartz aggregate exterior walls and sun shields; these reduce air-conditioning loads considerably. Interior finishes, vinyl asbestos and terrazzo flooring, vinyl wall coverings and glazed brick, were chosen for appearance and low maintenance. Combination light fixture-diffusers were used. First stage expansion will be a building similar to the west building, constructed at the other end of the east building, changing the T-shaped plan to an H.
Studies were made of transportation, communications, land and construction costs, and sources of employees in various geographical areas. The Heights-town area qualified on all counts. Checks were made of relationships of each company department with other departments and outside the company. Records were kept of contacts made by telephone, teletype, mail, and other means including personal contacts. Such studies indicated the feasibility of decentralizing some of the company's operations. The studies also led to close analysis of space relationships within the projected buildings, and to preliminary decisions on space allocations to various departments.

As time went on, the analyses went into finer detail. For example, since almost all of the people to be housed in the new buildings would be desk workers, the studies led to a module based on one clerical unit—a person and his desk. The optimum size of the module turned out to be 5 by 6 feet, based on the use of 5-foot desks without aisle space. Aisles were eventually sized at 5 feet.

From such basic space decisions, the general scheme of the major office building was derived. Two stories in height, this building was planned with a central core, around which is wrapped a 60-foot-wide, 12-module, columnless office area. This area is, for the most part, free of partitions except where absolutely necessary for privacy.

Without the intense and thorough study given to the location and operations of this building, the results might have been much less satisfactory. As it is, the relocation and planning studies were effectively performed and have resulted in efficiency and comfort. This is not only true of the major work areas, but also of the well-equipped medical offices, the pleasant cafeteria, employees' lounge and second-level terrace complex, and the executive offices and conference areas.
As utilities and highways fling their networks over the countryside, commerce and industry find increasing advantages in ex-urban locations for many segments of their operations. An example of such cost-saving freedom of choice is this electronic data processing center for American Airlines. Large enough to keep instant tabs on all reservations, schedules, cargoes and other details of a nationwide flight pattern, it fits unobtrusively into the residential suburbs of New York's Westchester County. The 10-acre site was selected over an urban alternate in spite of the owner's stipulations of nearly-infallible electric service, and the land was rezoned on the basis of architects' demonstrations of the building's suitability.

Site for the building is steeply sloping down from the highway. The roof, visible from the highway, is framed in steel pyramids over each 24- by 32-foot bay to provide a textured appearance compatible with the residential area. Exterior columns and fieldstone motif contribute to this compatibility.

Data processing machinery occupies only 7,000 square feet of a total building floor area of about 20,000 square feet. This heavy concentration of electronic machines requires a raised floor that will take 120 pounds per square foot live load, permit unlimited accessibility to connecting cables at any point through
removable, 18-inch-square, cast-aluminum panels, and serve as a plenum to deliver over 100 tons of air conditioning with a full air change every minute. Air enters the room through peripheral grills and through cable holes under machines. Each machine has a circulating fan to draw room air through it. Air is returned through ceiling grills which enter an overhead plenum ducted to fans in mechanical space on the lower level. A separate cooling and heating system serves office and reception spaces in the building.

The stipulation of absolute continuity of operation of the Sabre room required duplication of all cooling and electrical supply equipment with automatic change-over from one system to another in case of any failure. Electricity is supplied from two utility substations, and two stand-by diesel generators are ready to come on the line in seconds should utility power fail.

Framing of the building is structural steel. Interiors are plaster or wood panel partitions with vinyl asbestos or asphalt floor tile and acoustical tile ceilings. A 50-car parking lot is nearby for visitors and a staff of 80. The building can be extended at one end for future expansion.
OFFICES AND WAREHOUSE FOR AN INDUSTRIAL PARK

Facit, Inc., Headquarters, Burlingame, California
OWNER: Haas and Haynie Corporation
ARCHITECTS: John Carl Warnecke and Associates
MECHANICAL AND ELECTRICAL ENGINEER: Alexander Broome
STRUCTURAL ENGINEERS: Chin and Hensolt
LANDSCAPE ARCHITECT: Michael Painter of John Carl Warnecke and Associates
GENERAL CONTRACTOR: Haas and Haynie Corporation

Many companies find it expedient to build headquarters offices adjacent to outlying manufacturing or distribution facilities. This dual-purpose arrangement for the U.S. subsidiary of a Swedish manufacturer of office machines and furniture houses the headquarters office of western U.S. operations and serves as a distribution and service center for equipment and parts. It represents a kind of lease-purchase office building for which a characteristically tight schedule of 11 months from start to occupancy, including site selection and financing, seems to have imposed no sacrifices to distinctive appearance and efficient flexibility.

Located on a level site in an industrial park just south of San Francisco Airport and off the Bayshore Freeway, the two elements—offices and warehouse—are physically separated from each other but are tied together visually by carefully detailed wood fencing and landscaped courtyard.

Simple yet rich, the office building has exposed light steel framing, painted white, on the ground floor. Mullions between the aluminum sash are black, contrasting with the white of the structure and fascia and the gray of natural cedar spandrel panels.
The treatment is continued around the office element, making it all of a piece and providing a 360-degree sweep of windows overlooking the surrounding area. The protective overhang, 7 feet deep, has a gray cedar soffit.

The basic structure of the office building is steel frame with wood frame floors and roof; that of the warehouse tilt-up concrete with four interior columns and wood frame roof.

A major design element of the office interior is a circular stair with 3-inch-thick oak treads mounted on a central tubular steel support. Interior partitions in this building are glass or are finished with cedar paneling except in the cafeteria where wallpaper is used. Ceilings are light color acoustical tile panels.

Both offices and warehouse were planned for expansion.
The nicely-proportioned, well-detailed precast concrete curtain wall wrapped around the second floor of this small office building is—at first glance—its most striking feature. Inside the building, which functions as the international headquarters of F.T.D.A. (Florists’ Telegraph Delivery Association), the proportions and detailing are equally well handled. Located adjacent to the John Lodge Expressway leading from northwest Detroit downtown, the building is the first completed in a new urban redevelopment area.

Constructed of poured-in-place reinforced concrete with precast double tee roof construction, the building is enclosed on the ground floor with blue glazed brick and a glass and aluminum store front, on the second with a precast concrete curtain wall finished with exposed quartz aggregate and white cement. Curtain wall panels are one module wide—5 feet 3 inches—and of story height. Windows are fixed aluminum with plate glass. Interior partitions are painted gypsum plaster on metal lath or movable aluminum with glass and mahogany or vinyl finishes. Flooring is vinyl tile; ceilings are mineral acoustical tile.
Functionally, the F.T.D.A. building divides in two; the data processing clearing house, printing and mailing areas are located on the ground floor. In this manner, not only were different functions separated completely from each other, but all of those requiring heavy equipment were placed on the ground floor. Since the organization had suffered—in its former headquarters—from the encumbrance of large columns in small bays, in this building the second floor was designed with a clear span creating columnless space on the interior. To accomplish this, precast concrete double tee joists spanning 42 feet were used.

Bays in the building are 21 feet; each is subdivided into four 5-foot 3-inch modules. On the module lines throughout the building, a 3-inch-wide strip is built into the ceiling to receive the heads of partitions. This also makes possible strict concurrence with a 1-foot even dimension ceiling tile pattern with no cutting of tile panels.
THREE DIVISIONS
BUILD AROUND
A GARDEN LOBBY

Dow Center, Houston, Texas

OWNER: Century Properties, Inc.

ARCHITECTS-ENGINEERS: Caudill, Rowlett and Scott
Charles Lawrence, project designer

LANDSCAPE ARCHITECT: James Dalrymple

CONTRACTOR: Farnsworth & Chambers Co., Inc.

When Dow Chemical Corporation's Brazos Oil and Gas Company Division grew out of its downtown Houston office base, a census of employes revealed that most of them lived in southwest Houston and were feeling the pinch of high parking costs downtown. At the same time, Caudill, Rowlett and Scott were also looking for new Houston offices. Investigating whether a joint office structure might develop something more attractive than either organization could achieve on its own, the architects approached Century Properties which had suitable land and finances to handle the project. Dow's other Houston divisions, the Engineering and Construction Services Division and the Regional Purchasing Office joined in a program of relocation and outlined their space needs. A total of 125,000 square feet was the ultimate assignment to be provided in several stages.

To maintain tenant identity while effecting economies in needed climate control, a complex of three rectangular structures tied together by a lobby was designed. The lobby is an open garden with translucent plastic roof. Walls facing the lobby are of glass, while all other building walls are dark brick with narrow slits of glare-reducing glass, providing protection against the sun, and accentuating a reinforced concrete structural grid set on a 24-foot module and painted off-white.

The canopied garden lobby provides a tempered transition between outside weather and air-conditioned space. It also houses connecting hallways and
stairs, removing these spaces from the air-conditioning load. All landscaping is concentrated in the lobby area, and the translucent roof shields glass walls of the court from the sun. The canopy roof consists of reinforced plastic structural beams, 3 feet wide, 38 feet long and \( \frac{1}{4} \) inch thick, built up of liquid polyester resin and glass-fiber cast in shallow elongated pyramids. These provide for 20 pounds per square foot live load while permitting 20 per cent light transmission to allow plant growth in the landscaped lobby.

Interior flexibility is practically unlimited, with only the mechanical facilities in fixed positions. Three-phase electrical distribution is through an under-floor duct system. An under-floor telephone raceway system also contributes to layout flexibility.

The Dow Center of Houston won the Texas Society of Architects' Award of Merit in 1961.
Financial buildings are a basic city element, and the site chosen for the First Federal Savings and Loan Building is at the center of the financial and commercial activity in downtown Detroit. One of the difficulties posed by the triangular site was in relating the new building to the existing buildings and to the old City Hall park. To establish a rectilinear and unified background for the park the First Federal Building was placed squarely at right angles to Woodward Avenue rather than following the line of Michigan Avenue as the old Majestic Building on this site had done. In the final triple-tower design, this orientation set off the east tower as a dominant element visible from many points in the city.

All vertical elements such as elevators and stairs are located in the north tower leaving the two rental towers completely free of interior columns or obstructions for maximum flexibility.

A dark, polished granite was chosen to give per-
manence to the facing material, and the cost of this selection was kept in line by taking advantage of precast panel technology. A dark shade was chosen for low maintenance in Detroit's atmosphere and for contrast with other buildings at the city's hub. Its polished surface will reflect light in an ever changing expression.

The building will be 23 stories high, plus a basement, for a gross area of 380,000 square feet. Framing will be welded steel. Main columns will be in caissons into bed rock. Secondary columns will be on concrete mat. Floors will be reinforced concrete. Floors in machine accounting space will be elevated with removable vinyl-surfaced panels in a metal framing system having adjustable steel posts bearing on the floor slab. Links between towers will be faced with aluminum and glass. Glass in all of the windows above the first story will be gold-solar plate glass. Exterior pavements will be provided with pipes for snow melting.
Support for Basic Engineering Research

Research in the broad range of engineering as well as in the engineering sciences at educational institutions is now being encouraged by the National Science Foundation. The areas eligible for financial support include: (1) development of principles and techniques in systems engineering; (2) development of principles and a philosophy for creative engineering; (3) interdisciplinary research related to biomedical engineering, transportation, fire prevention and urban planning; (4) development of principles of generation and control of energy systems and information systems; (5) analysis and synthesis of processes and systems which contribute to mastery of the physical environment.

New Method for Measuring Sound

A new "American Standard Method for the Physical Measurement of Sound" has just been issued by the American Standards Association for prescribing the way in which to measure sound, whether it comes from a jet aircraft or from the high school orchestra. ASA S1.2-1962 specifies the tools to be used and measurement procedures.

Conference on Electronic Computation

The Third Conference on Electronic Computation sponsored by the Structural Division of the American Society of Civil Engineers is now scheduled for June 19-21 at the University of Colorado in Boulder. The preliminary program calls for sessions on: (1) state of the art; (2) new developments in structural analysis; (3) research in automated structural design; (4) new computer applications to structural engineering. General inquiries regarding the conference may be addressed to Jackson L. Durkee, Secretary Committee on Electronic Computation, Bethlehem Steel Co., Fabricated Steel Construction, Bethlehem, Pennsylvania.

More on Condensation Within Walls

A knowledge of temperature gradients through building envelopes can help tell the architect such points of information as whether or not there may be a tendency for a solid wall to bow in and out due to a huge temperature difference between exterior and interior surfaces, and whether or not there may be condensation within a wall or roof structure which can result in deterioration of materials and negation of insulating value. A recent issue of the Canadian Building Digest, (CBD 36) a publication of the Division of Building Research, National Research Council, Ottawa, shows how these thermal gradients are determined.

In a research study on insulation of cavity walls for housing, sponsored by the Division of Housing and Community Renewal of the State of New York, as reported on this page in the January issue, it was found that condensation occurred within the inner wythe of a cavity wall because the temperature of the material was at the dew point of the air migrating through it. The wall cited consisted of brick, air space, polystyrene insulation on the cavity side of cement-wood fiber slabs. Subsequently, a new wall was tested comprised of brick outer wythe, air space, cinder block, polystyrene insulation and plaster. It was incorrectly stated in this item that the polystyrene insulation was moved to the room face of the inner wythe on the new construction because of the earlier findings. Joshua D. Lowenfish, chief, Architectural Research for the Division of Housing and Community Renewal points out that the polystyrene could be used either on the cavity or room side of the inner wythe of the new wall with equal effectiveness. Application on the room side was considered more easily controllable for construction.

This Month's AE Section

HOW STRUCTURAL MODELS ARE USED IN PRACTICE

Leading consultant describes a number of pioneering applications

By Jack R. Janney

Freedom and precision in the design of building structures, particularly indeterminate ones such as shells and space frames, have been handicapped in the past by the available analytical tools. First, it is difficult to visualize and predict the behavior of these structures, and to develop the mathematics that correspond to the presumed behavior. Even then, exact solutions are frequently tedious and time-consuming, so simplifying assumptions are incorporated to make analysis practical; and, naturally, these assumptions tend to be in a conservative direction for safety's sake.

The testing of structural models not only demonstrates structural behavior under load, but, more importantly, provides strain and stress data and deflections for structural design. The classical methods of analysis, adjusted by experience factors (i.e., engineers' intuition and codes) are, nonetheless, requisite so that there is a sound basis for design of the models themselves, and their shape will be headed in the right direction for efficient flow of forces. But because the mathematical analysis only approximates actual behavior, model data will frequently indicate desirable modifications to improve structural efficiency, in addition to providing structural design data that otherwise would be extremely difficult, if not impossible, to determine.

The basic function of structure is to oppose gravity forces. The final criterion which serves engineers in determining the structural adequacy of any configuration is the magnitude of stresses produced by gravity. (Of course wind forces must be considered for tall buildings and seismic forces in earthquake areas.) How does one establish the magnitude of these all-important stresses? The normal approach involves the use of a drawing which depicts the structure or, most commonly, a part of it. With the aid of mathematics this picture is used to evaluate stresses produced by gravity and in some cases wind or seismic forces.

The picture is usually restricted to a two-dimensional configuration for the sake of simplicity.

This method of solving structural problems is sometimes referred to as the "mathematical model." The mathematical model may range in complexity from the solution of stresses produced in a simple beam, to the solution of a highly indeterminate structure such as a complicated shell or space frame.

The Limits of Mathematics

Usefulness of the mathematical model is determined by the following:

1. The ability to express the problem in mathematical terms for which a solution exists or can be obtained.
2. Time, and consequently expense, required to solve the problem after it has been expressed mathematically.
3. The validity of boundary condition assumptions (i.e., where structure is restrained, as by edge beams) which must be made before a solution is feasible.
4. The extreme difficulty encountered in thinking of structural interaction in three dimensions.

In spite of these restrictions many notable structural advancements have been taken place in recent years. However, structural designers of buildings do not have to perform their function with the degree of exactitude demanded of aircraft designers.

Such inexactness would be very unsatisfactory in the efforts of space engineers to place a vehicle on the moon. It would also have retarded the development of aircraft technology. In the first place, aircraft engineers have not been constricted by small engineering budgets as have structural engineers. Also because of the limitations of the mathematics, aircraft designers have made extensive use of "physical" models. Use of physical models to assist in the design of structures is not a new concept in the building field. The idea of employing such a design tool has simply lay more or less dormant for many years in the United States. Structural models have been an important and well accepted part of the design process for complicated structures in Europe. This is especially true in the design of dams.

Some of the early work done by Beggs, Eney and others in the United States is well known to many engineers. Most of their effort as well as most of the work done in photoelastic studies of structures has been confined to investigations of two-dimensional models. The United States Bureau of Reclamation and the University of California have accomplished a great deal in the study of dam structures with small scale models. M.I.T. currently is studying models not only for elastic behavior, but for ultimate strength as well.

Interest has been revitalized in the past three years as a result of: (1) improved technological methods for performing structural model analysis, and (2) increased architectural interest in unconventional structures.

The writer has been involved in about 20 studies which have made use of small scale models during this period. These models have been made of acrylic plastic, and consequently the investigations have been limited to elastic behavior.

Data Provided by Models

Two basic types of measurements are taken on models made of plastic: strains and deflections.

Since models are exact scaled-down versions of actual structures, strain gages can be attached to opposite sides of any surface, and in this way not only can tensions and compressions on the surfaces be determined, but also moments, shears, torsions and reactions at supports.

The strain gages are attached to the models in a rosette pattern, in pairs, or singly depending on the type of structure and information wanted. When strains occur in several directions, as in thin shells, then
The complete experimental setup for measuring strains (and thus stresses) for a thin shell under uniform loading is shown in Figure 1 (left). Strains are measured by means of very small diameter wire gages fastened to the model. Each patch on the model has three gages in a rosette pattern, since the stresses are multi-directional. The model is loaded by evacuating the air from under it with a vacuum pump (note hose lower right). The amount of vacuum is registered on the manometer (upper right). Movement of the shell makes the wires lengthen (tension) or shorten (compression). Lengthening or shortening of the wires changes their resistance which is registered on the electronic meter in the foreground.

This model is of a shell for a physical education building containing field house and swimming pool for Munster, Indiana. The architect is Bachman & Bertram & Associates, and the structural engineer is Kolbjorn Saether & Associates. This "free-form" shaped shell is comprised of a circular dome connected to an elliptical conoid by means of hyperbolic paraboloids. The dome and conoid are prestressed across arcs of their perimeters; prestressing tendons also cross the h.p.'s

Display model of the Eastman Kodak pavilion for the 1964 New York World's Fair is shown in Figure 2 (above). It literally is a free-form shape, made up of many shell shapes, few of which could be expressed accurately by mathematics. The structural model in Figure 3 (left) was used to provide stress patterns and column reactions. Designers, Will Burtin, Inc.; architects, Kahn & Jacobs; structural engineers, Lev Zetlin & Associates.
three-gage rosettes are installed.

To convert stresses determined from models to stress values for actual structures, they are multiplied by similitude factors (i.e., relationships of moduli of elasticity, sizes and magnitudes of loads for model and actual structure).

A thin shell model is loaded by evacuating the air under it with a vacuum pump. Structures such as beams, frames and arches are loaded by positioning of weights.

Deflections are measured by using dial deflection gages, linear differential transformers or precision levels. A reference grid is used to determine differences between original elevations and elevations under load.

The structural models which we have tested and analyzed as design aids for specific projects have ranged in purpose from providing nearly the complete source of design information to performing simply a check on some structural feature open to question.

Examples of Models

Some example projects are discussed below with respect to purpose and accomplishment, from design as well as economic standpoints.

The model shown in Figure 1 is of a “free-form” thin shell for a high school. The model analysis is being conducted under conditions most effective with respect to the architect-engineer relationship: the two began collaboration at the outset of the preliminary architectural studies. Thus, the architect gained the greatest freedom from structural restriction, and this freedom was further expanded because the structural engineer was fully aware of the value of a structural model analysis. In this case the structural model and a mathematical model are being utilized simultaneously. This gives a check so that the deficiencies of each is being overcome.

The structural model of the complicated thin shell for the Eastman Kodak Pavilion at the New York World’s Fair, 1964, is shown in Figures 2 and 3. This model served as a primary source of design data in the structural design process. It also served to establish the space coordinates on which the construction drawings were based.

The interaction of the many shell shapes, few of which could be expressed mathematically, along with the compound system of supporting elements, made it very difficult to develop an accurate mathematical method. Therefore, the structural model was used to provide stress patterns and column reactions. This building is now under construction.

The structural model shown in Figure 4 is of a 29-story apartment using a reinforced concrete flat-plate construction.

A simultaneous study of a mathematical model was made. As a result of comparison between the two methods, the slab steel indicated from the mathematical model was reduced 15 per cent. The shear wall size and disposition was based on the findings of the structural model analysis. The cost of the model was about 15 per cent of the amount of the savings.

The structural model shown in Figure 5 was built and tested as part of a comprehensive development program which was undertaken by Material Service Corporation of Chicago before manufacturing and marketing a precast, prestressed hollow-core floor unit. In addition to tests on a model, a number of load tests were performed on prototype units built under pilot conditions to full scale. The purpose of the model was to learn something about the rather complicated secondary stresses which occur as a result of the Vierendeel-like action in the lateral direction at the end bearing. Also the buckling characteristics of the very thin elements of the concrete cross-section were evaluated.

Obviously, it was much less expensive to perform tests on the small scale model than on full-sized members. However, some testing was done especially to observe behavior throughout all ranges of loading to failure, and enough checking was done during these full scale tests to substantiate the model findings.

The purpose of the model of “wishbone” supports for an access roadway at O’Hare Airport shown in Figure 6 was one of redesign. The original design incorporated large hinges in the supports which were employed to assist in design by mathematics. The structural engineer, in his effort to conserve construction cost, decided to use a structural model analysis and thereby eliminate the costly hinges. Also, his decision was influenced by his knowledge of the probability of other savings through the design refinement resulting from a structural model analysis. The savings resulting from the redesign were about 200 times the cost of the model analysis.

The structure shown in Figure 7 is an open-spandrel arch bridge of five spans which was redesigned before construction in the interest of economy. The original design was based on a conventional mathematical model which presumes the arch to act alone in carrying the loads of the spandrel walls, bridge deck and live load. When bids were received for the structure based on the original design, engineers felt that the cost was too high. A redesign appeared to offer the best remedy for the situation, if advantage could be taken of the strengthening effect of permitting the arch rib, spandrel walls and bridge deck to act together to resist the loads. Such an assumption produces a highly indeterminate structure. Partially in the interest of time, but also in the interest of cost, a structural model was used for the redesign. The redesign was accomplished in a period of a few weeks and resulted in a considerable reduction in cost. It also produced a more graceful structure. The arch rib was reduced in thickness from 18 in. to 14 in. at the crown, and from 36 in. to 18 in. at the springline. The cost of the model analysis was less than 1 per cent of the savings.

Only those engineers who have firm confidence in their own ability will seriously consider the use of structural models. They are not afraid to ask the architect to approach the owner, who is certainly the principal beneficiary of design refinements, and request special appropriations for the model analysis. This is usually necessary because the fee structure of both architects and engineers seldom contains budget provisions for such effort.

Many engineers are reticent to pose the problem to the architect for fear that it will be construed as an admission of inability. The architect is often hesitant to approach the owner for the same reason. As a consequence, in those areas of doubt, very conservative assumptions are made with the result that the structure is built at greater costs than would otherwise be necessary. In the other extreme the assumptions may be incorrect, with resulting inadequate factors of safety or undesirable behavior.
Tests on the model of a 29-story flat plate structure for Carl Sandburg Housing in Chicago (Figure 4, left) indicated that 15 per cent less slab reinforcement was necessary than mathematical analysis showed. Also shear wall size and location was based on the structural model analysis. Cost of the model analysis was about 15 per cent of the savings it made possible.

Although the floor plan has an irregular column spacing, the structure itself contains nothing new. But taking into account the conservatism of conventional design procedures, the engineer turned to structural model analysis to determine slab moments caused by vertical loads and lateral wind forces. Architects, Solomon, Cordwell & Associates; structural engineer, Alfred Benesch.

Hollow-core prestressed floor units manufactured by Material Service Corp. of Chicago (Figure 5, below, left) were tested in model form to determine secondary stresses at the bearing point and also buckling characteristics of the thin units.

"Wishbone" supports for access roadway at O'Hare Airport were designed without hinges through model analysis (Figure 6, below). Architects, C. F. Murphy Associates; structural engineer, Alfred Benesch.

Structural model analysis of this open-spandrel arch bridge for the Illinois Tollway indicated that the arch rib could be reduced considerably in thickness from that indicated by mathematical analysis, cutting cost and producing a more graceful structure (Figure 7). The mathematical analysis presumed the arch to act alone in carrying loads of spandrel wall, bridge deck and live load. In actuality, the elements all work together, and this behavior could easily be determined by testing a model. Structural engineers, Vogt, Ivers & Associates; managing engineers, Knoerle, Bender, Stone Inc.
CUTTING IMPACT NOISE IN APARTMENT BUILDINGS

New FHA Guide developed by Bolt, Beranek and Newman shows how to limit impact noise through floors due to footfalls, dropped objects and vibrating appliances.

The first impact noise level criterion for multifamily dwellings to be presented in this country has just been issued by the Federal Housing Administration. Developed under the Technical Studies Program of FHA by consultants Bolt, Beranek and Newman, Inc., the criterion is given in “A Guide to Impact Noise Control in Multifamily Dwellings” which includes as well a compilation of noise isolation performance data on 47 different apartment house floor-ceiling constructions (12 shown in this article) and information on proper architectural detailing.

Impact Noise Defined
The FHA publication is a concise and readily usable guide to the control of impact noise. It does not either amend or supplant the Minimum Property Standards, and thus constitutes an FHA recommendation to designers and owners, not a requirement.

Impact noise is caused by an object striking or sliding on a wall or floor structure, such as footsteps, dropped objects, movement of furniture or door-slamming. Also it may be caused by a vibrating appliance such as a dishwasher, toilet or food-disposal apparatus. The floor (or wall) is set into vibration by direct impact or mechanical contact, and sound is radiated from both sides of the floor. For this type of noise, the surface of the floor is very critical as regards the amount of noise generated.

The more familiar airborne noise is produced by a sound source such as a human voice, a musical instrument, a TV or radio set. Airborne sound waves radiate outward from the source through the air until they strike a wall, floor or ceiling which is set into vibration. Because the room structure vibrates, it radiates sound to the other side. Airborne transmission is usually minimized by making the party wall massive or of a complicated structure.

Impact noise is minimized by two principal techniques: (1) resiliently connecting the component parts of the floor-ceiling construction, and (2) “floating” the upper part of the floor on a relatively soft material or carpeting the floor.

While control of airborne sound is very important, techniques for its control are much better known in this country than for impact noise. Some of the measures recommended to reduce impact noise, however, will also help to control the transmission of airborne noise through the floor-ceiling construction.

The United States is one of the few highly developed countries which does not have some kind of requirement for control of noise in its building codes. In contrast since 1938 many foreign countries have instituted control measures, based on the results of careful and extensive programs of study. Measurements of the existing impact noise isolation in actual dwellings have been compared with the results of detailed interviews with the tenants in literally thousands of cases—in England, Sweden and the Netherlands in particular.

Lacking data on impact noise in the United States, the FHA sponsored a careful examination of foreign codes (especially the German, British and Swedish codes) and studies, and has adapted the results to the needs of the American people,
considering the significant differences in population density, living habits, noise environment, tolerance for noise, construction costs, etc.

It is important to note that a neutral background noise from flowing traffic or air-conditioning equipment is exceedingly important in all noise control situations because it helps to mask the sporadic intruding sounds. An intruding noise which would be intolerable in a quiet town might go completely unnoticed in an apartment on a busy street where the continuous hum of traffic masks noises from next door without itself seeming unpleasant. It is a major failure of all existing codes that this fact is not considered. The recommendations given by FHA apply to dwellings in which the ambient noise is typical of apartments in moderately quiet neighborhoods. For quieter areas, floor construction should be better than what the FHA data indicates as just acceptable constructions. In noisy urban areas poorer construction may be tolerated.

As a result of years of building construction without requirements for noise control, it is not surprising that many “typical” floor-ceiling constructions are inadequate as regards impact noise. Improvements will entail some increase in cost, but this increase will be small if noise control is considered early in the planning of buildings; in fact, it can be surprisingly inexpensive, and can be designed to yield ancillary benefits such as thermal insulation.

FHA Design Tools
In the FHA Guide, three practical and essential tools are presented for use in the control of impact noise:

1. A curve of recommended sound pressure levels in decibels that should exist in a room below a particular floor-ceiling construction. This curve is shown in Figure 1; see also discussion below.

2. A collection of impact performance curves characteristic of typical U.S. floor-ceiling constructions. Some of these are more common in Europe, but yet resemble fairly closely U.S. constructions. Each curve is presented so that it can be compared directly with the maximum curve mentioned above. These constructions are all classified as to whether or not they provide the recommended isolation. (See Figures 2 and 3.)

3. A check list of precautions and suggestions, supplemented by rough sketches of architectural details (see Time-Saver Standards following this.
Architectural Engineering: Impact Noise

1. Wood joist—thin ceiling, walls

2. Wood joist with floated wood raft

IMPACT NOISE RATINGS (INR) FOR

1. Wood Joist; “Thin” Ceiling and “Thin” Walls: INR = –18
   Total Thickness: 8½ in.
   Total Weight: 7 lb/sq ft
   Basic Construction: 2- by 8-in. wood joists with ¾-in. T & G floor boards nailed to joists.
   Ceiling: ¼-in. plasterboard nailed to joists, joints sealed.
   Remarks: Two of the supporting walls were 4½ in. thick, the other two were 9 in. thick or less.

2. Wood Joist; Floated Wood Raft: INR = –4
   Total Thickness: 9 in.
   Total Weight: 8 lb/sq ft
   Basic Construction: 2- by 7-in. wood joists, 16 in. o.c.
   Floor Finish: None.
   Ceiling: ¼-in. gypsum board, finished with plaster skim coat.
   Remarks: The INR could be improved to –4 if a heavy plaster ceiling were used. The performance of this structure tends to deteriorate with time.

3. Wood Joist; Resilient Flooring, nailed.
   Ceiling: INR = +5
   Total Thickness: 9 in.
   Total Weight: 10 lb/sq ft
   Basic Construction: 2- by 8-in. wood joists, 16 in. o.c. with ¾-in. T & G fir flooring, nailed.
   Floor Finish: None
   Ceiling: ¾-in. gypsum board screwed to resilient metal runners, nailed to and bridged across joists, 12 in. o.c. Joints taped and finished.

4. Wood Joist; Carpet on Foam Pad
   Ceiling: INR = +5
   Total Thickness: 9 in.
   Total Weight: Unknown.
   Basic Construction: 2- by 10-in. wood joists, 16 in. o.c.; ½-in. fir plywood subfloor nailed 8 in. o.c. to joists; ¾-in. fir plywood covering subfloor (joists staggered) and nailed through to joists.
   Floor Finish: INR = +5
   Ceiling: ¼-in. nylon carpet (¾-in. pile) on ¼-in. foam rubber pad.
   Ceiling: ¼-in. gypsum board nailed 12 in. o.c. to joists; joints taped and sealed.

5. Wood Joist; Resilient Hung Ceiling

1. Concrete slab—suspended ceiling

IMPACT NOISE RATINGS (INR) FOR

1. Concrete Slab on Steel Bar Joists; Vinyl Tile: Sus. Ceiling: INR = –10
   Total Thickness: 11 in.
   Total Weight: 30 lb/sq ft
   Basic Construction: 7-in. steel bar joists, 27 in. o.c.; on top of bar joists: 2-in. concrete floor slab on ¾-in. rib lath.
   Floor Finish: ¾-in. vinyl asbestos tile cemented to concrete.
   Ceiling: ½-in. furring channels, 16-in. o.c. wire tied to bottom of joists; ½-in. gypsum lath attached to furring channels by clips; ½-in. sanded plaster and ½-in. coat of lime putty finish.

2. Concrete slab—carpet; sus. ceiling

SLABS OVER STEEL JOISTS

1. Concrete Slab on Steel Bar Joists; Carpet on Foam Pad; Suspended Ceiling: INR = –28
   Total Thickness: 11½ in.
   Total Weight: 39 lb/sq ft
   Basic Construction: 7-in. steel bar joists, 27 in. o.c.; on top of bar joists: 2-in. floor slab on ¾-in. rib lath.
   Floor Finish: ¾-in. nylon carpet (¾-in. pile) on ¼-in. foam rubber pad.
   Ceiling: ½-in. furring channels, 16-in. o.c. wire tied to bottom of joists; ½-in. gypsum lath attached to furring channels by clips; ½-in. sanded plaster and ½-in. coat of lime putty finish.

4. Wood joist—carpet on foam pad

WOOD JOIST FLOORS

Typical floor constructions illustrated in the Guide have thus been assigned an Impact Noise Rating (INR). What this value essentially indicates is how many decibels a curve needs to be shifted down or up to meet the FHA curve. If the floor curve has to be moved down the Impact Noise Rating will be negative; if it can be moved up, the INR will be positive. The INR thus provides a means of rank-ordering a large number of different constructions: the higher the INR, the better the impact isolation provided. Negative INR values fail to meet the FHA recommendation; positive values exceed it.

Impact noise transmission through a typical wood joist floor covered by tile is shown in Figure 2. The Impact Noise Rating (INR) for this construction is –17; this is indicated by the small black rectangle along the right margin of the graph. The INR value for the FHA recommended curve is zero. When carpet and a foam pad are substituted for the floor tile the INR is raised to a value of +5.

article) which show how a basically good floor construction often is spoiled by oversight in matters of detail.

Figure 1 is FHA’s recommended curve which shows for each frequency the maximum acceptable Impact Sound Pressure Level (ISPL) due to thumping a floor overhead with a standard tapping machine. The measurements are to be made in the field and adjusted to a receiving room assumed to have a reverberation time ($T_v$) of 0.5 seconds. The shaded area represents the range covered by various European codes. A floor-ceiling construction which provides enough isolation to fall on or under the FHA curve meets the FHA recommendation absolutely. To take into account the possibility of slight errors in field measurements, a floor construction can exceed the FHA curve a mean amount of not over 2 decibels (averaged between 100 and 2,300 cps). At no point, however, may a floor construction exceed the FHA curve by 8 decibels.

Frequently it is useful to know more than whether a construction meets the FHA recommendations or not. Therefore, a single number rating scheme was devised to show whether a floor barely achieves the requisite isolation, or by how much it is over or under the recommendation. Typical floor constructions illustrated in the Guide have thus been assigned an Impact Noise Rating (INR). What this value essentially indicates is how many decibels a curve needs to be shifted down or up to meet the FHA curve. If the floor curve has to be moved down the Impact Noise Rating will be negative; if it can be moved up, the INR will be positive. The INR thus provides a means of rank-ordering a large number of different constructions: the higher the INR, the better the impact isolation provided. Negative INR values fail to meet the FHA recommendation; positive values exceed it.
Plaster must be airtight to get most loss of energy through the structure and to prevent transmission of airborne noise.

All penetrations must be caulked to prevent transmission of impact sound through piping, ductwork; also to stop airborne sound (above). Conduit and duct connections must be flexible to maintain impact noise reduction of floor (below).

Pipe penetrations are sleeved and packed to prevent the impact noise from being carried through the pipe.
IMPACT NOISE CONTROL DETAILS FOR DWELLINGS: 2
Prepared for FHA by Bolt, Beranek and Newman, Inc.

**SHORT-CIRCUITING OF FLOATING RAFT FLOORS**

Top two sketches show proper location of services under a floating floor. In bottom sketch, service "shorts out" resilient layer, since it is directly under floor.

**DETAILS OF WOOD FLOATING RAFT FLOOR**

**CONSTRUCTION OF A TYPICAL FLOATING RAFT FLOOR**

Piping through floors should be sleeved and caulked so that floating floor will not be short-circuited. Electrical boxes should be isolated from the finish floor by a gasket.
IMPACT NOISE CONTROL DETAILS FOR DWELLINGS: 3

Prepared for FHA by Bolt, Beranek and Newman, Inc.

**PLASTER CEILING ON RESILIENT CLIPS ATTACHED TO WOOD JOISTS**

- Glue on glass fiber
- Install ceiling
- Cut off & caulk

Packing partition penetration

**Typical resilient clip**

**"MIXED" CONSTRUCTIONS**

If different construction types are flanked, impact noise from the "poorer" construction will travel through structural slab on the floating floor side

**IMPROPER PARTITION SUPPORT**

If partitions are set atop floating floor, either the topping will shear, or compressed topping and pad will offer direct sound path

**CONNECTION DETAILS FOR W.C.**

- Neoprene washer
- Washer
- Bolt with neoprene sleeve
- Clearance (1/2"

Support valve from fixture

Caution: Neoprene or "caulk" must not short out floating floor

- Neoprene pad
- Mounting bolt
- Wax ring
- Ring
- Soil pipe
A DUAL-DUCT APPROACH FOR OFFICE BUILDINGS

The heating, ventilating and air-conditioning systems of many new urban, multi-tenanted office buildings are laid out to accommodate the "average" tenant. Unfortunately, in many instances, there is no "average," and much of the ductwork and associated equipment must be relocated or replaced, at an additional cost to owner, tenant or both.

The consulting engineering firm of Sidney W. Barbanel made a thorough study of such tenant changes in dozens of buildings designed by their firm and others, to find a method of eliminating such extras. They developed a design approach which combines a "new look" at over-all design and distribution to avoid the re-location problem coupled with an unusual but dependable and economical bidding system for the mechanical contractor.

The heart of their approach involves the use of a dual-duct system for both interior and exterior locations plus an under-window perimeter radiation system.

For design of the air supply system, the building is divided into conveniently sized and located zones for shortest possible horizontal runs and minimum offsets of vertical runs. Very often the floors are divided into quadrant zones rather than an interior and an exterior zone.

Then a dual-duct distribution system is laid out for the horizontal runs of a typical floor, providing a large number of individually controlled zones in the interior as well as exterior. The dual-duct system permits maximum control flexibility for either interior or exterior areas.

Instead of asking the mechanical contractor for a lump sum for the entire building, with individual tenant changes to be negotiated later, the engineers ask for a price per pound of net installed weight of sheet metal, with a given factor for different gages, this to be multiplied by the "net surface" of metal installed.

Similarly, unit prices are obtained for typical air mixing boxes of various sizes, complete and connected; net price for diffusers and return registers; price per lineal foot of finned-tube radiation, etc.

With the manner of take-off thus specified, it is easier for the mechanical contractor to estimate the job. Not only is less estimating time required for contractors, but also there are no unforeseen items to crop up later, and the result is that bids have come in 40 per cent less than might be expected under normal bidding practice.

If a tenant wants more flexibility than provided in the original design, then the owner must pay for the extras incurred by the contractor and charge this against the tenant. If the contractor installs less than indicated originally for the typical floors, then he must pay the owner a rebate.
New Corbin SLIM-MASTER UNIT* saves letter box space ... gives you slim, modern design

Where your letter box space is limited ... or where you want compact, modern design ... the new Corbin Slim-Master Letter Box Unit is your answer!

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the new Mahonaire concept*

thin-line package incorporates air distribution, structural deck, lighting, utility raceways, and acoustical finished ceiling in as little as 6" in depth!
Heating and cooling have always before been handled as accessories which must be added to the fundamental building at the cost of extra space. The MAHONAIRE air ceiling concept now incorporates this into the basic structure itself in little or no additional space and at substantial savings over conventional ductwork systems. Costing little more than the basic structural elements themselves, MAHONAIRE can be installed for heating when the building is erected and can then be utilized at any later time for air-conditioning.

In addition to the cost savings in air distribution system materials, the savings resulting from building height reduction are substantial.

**AIR DISTRIBUTION** Mahonaire ceilings eliminate conventional ceiling diffusers and costly distribution ductwork. High aspiration of diffused air avoids cascading of delivered cold air or stratification of delivered hot air. Downward air directional control reduces dust or smudge streaking of the ceiling.

**STRUCTURAL SUPPORT** High strength-weight ratio of Mahonaire deck allows economical design. Long spanability eliminates intermediate supports and provides excellent surface for either support and bond of insulation and roofing or as a concrete form for roof construction.

**RECESSED LIGHTING** Standard lighting fixtures can be installed continuously or intermittently between the beam webs. Versatility of the Mahonaire concept provides a ready solution of specific lighting and modular layout requirements.

**UTILITY RACEWAYS** Cells can be used to carry signal lines, sprinkler systems and similar utilities.

**SOUND CONTROL** Economical sound absorption is achieved by inserting sound-absorbing material in the cells of the perforated Cel-Beam members.

**FINISHED CEILING** Flush surfaces or exposed beam effect can be used. The metal surfaces are virtually indestructible and require no maintenance other than normal periodic painting.

For more information write for new catalog AC-63.

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DESIGN OF VENTILATING CEILINGS

Correct engineering assures even flow of air through perforated ceilings regardless of obstructions in the plenum.

A ventilating ceiling is a type of air-inlet system. It is a system with an extensive array of numerous small openings through which air is pushed at low pressure from an overhead plenum. The plenum is usually served by a single, elementary supply duct opening or duct stub. Whereas a conventional system has a few diffusers, each carrying a large volume flow of air, a ventilating ceiling has many small openings, each carrying a very small volume flow. There may be several hundred small openings per sq ft.

The ventilating ceiling and its associated plenum serve the same purpose in the complete air distribution system as do the diffusers and the associated local ductwork in the conventional system.

The return air systems and the main supply ducts are essentially the same for the conventional system and the ventilating ceiling, although there is some difference in local supply detail.

To help insure proper engineering design of ventilating ceilings employing perforated acoustical tiles or panels, the Armstrong Cork Company recently developed a complete design procedure. The salient factors involved are discussed here.

Advantages of a Ventilating Ceiling

1. Since the whole ceiling is used to deliver air, adequate air may be supplied directly to all parts of a room without drafts or stagnant spots.
2. Freedom from drafts is maintained even with very low ceilings and high air flow rates.

This article is drawn from technical information developed by engineers and physicists of the Armstrong Cork Company for use by architects and consulting mechanical engineers.

3. When the ventilating openings are close together, the flow of air repels dust-laden room air and virtually eliminates soiling by impingement and breathing.
4. A single duct stub can supply air for a very large area. This reduces the cost of supply ducts and eliminates diffusers.
5. The ventilating openings may be provided in a finish which absorbs sound.
6. A ventilating ceiling often permits use of a shallower floor-ceiling structure than does a conventional system.

Requirements for Proper Air Flow

In the case of a conventional system the diffusers and the local ductwork have to satisfy a number of requirements in order to deliver the proposed amount of air and distribute it according to a particular plan. Naturally, a ventilating ceiling and its associated plenum must also satisfy a number of basic requirements. The five basic requirements of a ventilating ceiling, so far as air distribution is concerned, are:

1. The ventilating ceiling must deliver to the space below it an actual total flow of air equal to the design total flow—the amount planned for that space by the mechanical engineer.
2. The ventilating ceiling must deliver the design total flow at a plenum pressure which does not exceed the safe load limit of the ceiling material.
3. The plenum pressure must be generally uniform throughout the plenum serving a zone.* This is necessary in order to produce a uniform air supply for the whole floor area of the zone when a uniform ceiling is used. It is also necessary so that intentional nonuniformity of air supply from place to place may be preplanned through intentional variations in the arrangement of ventilating and nonventilating tiles.
4. Although local pressure variations of limited extent and magnitude may occur in the vicinity of the inlet duct opening and in the vicinity of large obstructions in the air flow path (such as I-beams), these pressure variations must be kept under control by proper engineering. Negative plenum pressures must not occur—that is, pressure differences through the ceiling which will cause air to flow from the room, up through the ceiling, and into the plenum. Otherwise, local soiling of the ceiling...

* A zone is an area of a building for which the plenum above does not connect with any other space except through the ventilating ceiling and the supply ducts.
Fissured acoustical tiles for the ceiling in the Endicott Trust Building have a series of tiny holes for air supply.

Random perforated acoustical lay-in board serves for distribution of air in the lobby of Allied Research Building.

will occur due to the reverse air flow.

5. The ventilating ceiling must not introduce any new air flow noise.

Technical Factors

Effect of Plenum Pressure. With rare exceptions, the ventilating ceiling will deliver an actual total flow equal to the design total flow so long as the supply ductwork has been designed and adjusted to bring up to the plenum an air supply equal to the design total flow. In effect, the ventilating ceiling is a low-resistance element in series with the rest of the air supply system leading up to the zone served by the ceiling. In rare cases it may be necessary to consider the small pressure drop through the ceiling, that is the plenum pressure, in designing the supply ductwork and in balancing the system.

The value of the plenum pressure must be known, not only to establish the fact that it is small enough to ignore in this regard, but also because it has an important bearing on other technical factors. Recommended load limits for acoustical ventilating tiles are based either on tolerable noise due to flow of air through the ventilating holes, or on tolerable bending of tiles from the point of view of appearance. They do not represent rupture loads.

Design for Even Plenum Pressure

There are three things which may cause general changes of plenum pressure within a zone unless they are kept under control by proper engineering.

First, there are simple frictional losses due to the presence of the upper and lower boundaries of the plenum. These losses are similar to the well-known frictional losses in ducts, and they cause a progressive decrease of plenum pressure as the air moves across the plenum from the inlet duct opening.

Second, there are pressure losses due to turbulence around obstructions which impede the flow of air across the plenum (I-beams, recessed light housings, suspension channels, etc.). These losses are similar to the turbulent losses around dampers in ducts. Successive losses of this type cause a stepwise decrease of plenum pressure as the air moves across the plenum from the inlet end.

Third, there is a phenomenon, known as static pressure regain, which causes a progressive increase of plenum pressure as the air moves across the plenum. In general, this phenomenon is more important than the frictional losses due to the upper and lower boundaries of the plenum, but not necessarily more important than the turbulent losses.

In practice, all three requirements are considered for a preliminary arrangement of inlet duct openings (that is for a definite air projection distance); and each of the requirements then defines a tentative value of minimum plenum height. An actual plenum height must be chosen at least as large as the largest of the three tentative values. If this final plenum height is architecturally too large, either the ducts must be relocated to give smaller air projection distances, or another ceiling layout must be used to give higher plenum pressure. Either type of change will permit the use of a shallower plenum.

Turbulent Loss

There are always suspension channels or tops of T's, H's or Z's protruding into the plenum of a suspended ceiling. Usually there are other obstructions such as I-beams, concrete beams, recessed light housings, or other objects which impede the flow of air across the plenum. These obstructions lead to a progressive decrease of plenum pressure as the air flows across the plenum, because energy is lost in turbulence.

The largest pressure loss due to turbulence around an obstruction of...
STEEL DECKING DOUBLES AS TROFFER AND AIR SYSTEMS

Mahonaire ceiling system uses structural steel cellular deck cells as combined air runs and ceiling diffusers for conditioned air. Since the cells are an integral part of the floor-ceiling structure, space is saved as well as some of the cost of auxiliary ductwork and diffusers.

As shown in cross section, alternating cells are used for air diffusion, acoustical control and recessed lighting. Inside the air diffusion cells are metering plates which control amount and velocity of air admitted to the perforated diffuser plates at the bottom. These plates serve as the finished ceiling and are identical in appearance to the acoustically-perforated plates. Noise generated by the system is said to be low because of the many low-velocity air distribution outlets. The R. C. Mahon Co., 6565 E. Eight Mile Rd., Detroit 31, Mich.

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CIRCLE 301 ON INQUIRY CARD

more products on page 228
SENSIBLE HEAT CONTROL
To aid architects in making certain basic design decisions which influence the performance and cost of air conditioning, Owens-Corning Fiberglas has prepared a series of 60 color slides and commentary including the following topics: (1) fundamentals of heat flow relating to design of building shells, (2) analysis of heat gain and heat loss problems, and (3) systematic evaluation of these factors as they apply to initial and operating costs of air-conditioning systems. The slide illustrations and commentaries have been printed in a 65-page booklet, "Economies of Sensible Heat Control," which is available to architects and engineers writing on their letterhead. Owens-Corning Fiberglas Corp., Industrial and Commercial Div., Dept. MC, 717 5th Ave., New York 22, N.Y.

AIR CONDITIONING CONTROLS
Solid state controls, actuators and auxiliary devices form the Cybertronic system of air-conditioning controls described in a six-page folder. Fischbach and Moore, Inc., 9005 Sovereign Row, Dallas 7, Tex.

CIRCLE 400 ON INQUIRY CARD

PREFAB STEEL STAIRS
(A.I.A. 14-D) Folder gives details on Pico Pre-Erected Safe Stairs which are hoisted into position before stairwells are built. The steel staircases are built to meet specifications of floor levels and walls. Potomac Iron Works, Inc., 4711 Rhode Island Ave., Hyattsville, Md.

CIRCLE 401 ON INQUIRY CARD

FLOODLIGHTING BUILDINGS
"Building Floodlighting" gives details on the best ways to accent the architectural features of buildings at night. The 20-page booklet (TP-115) lists characteristics of incandescent, fluorescent and mercury lamps. Inquiry Bureau, General Electric Co., Nela Park, Cleveland 12, Ohio

CIRCLE 402 ON INQUIRY CARD

CHURCH FURNISHINGS
Church furnishings and accessories are illustrated and described in two catalogs, "Pews and Accessories" and "Educational and Church Furnishings." L. L. Sams and Sons, River at LaSalle, Waco, Tex.

CIRCLE 403 ON INQUIRY CARD

SUN CONTROLS
Vertical and horizontal sun controls, fixed horizontal fins, canopies and solar grill screens are described in a 16-page color booklet. Specifications and operating details are included. Brown Mfg. Co., P. O. Box 8488, Oklahoma City, Okla.*

CIRCLE 404 ON INQUIRY CARD

MOVABLE PARTITIONS
(A.I.A. 35-H-6) A 16-page booklet describes Hauserman Operable Wall, a sliding wall for adapting space in commercial and institutional buildings. A 36-page catalog gives details on Signature movable wall system for office and factory buildings. The E. F. Hauserman Co., 5711 Grant Ave., Cleveland 5, Ohio

CIRCLE 405 ON INQUIRY CARD

CERAMIC TILE
Full-color photographs of installations illustrate a 36-page catalog on ceramic tile with descriptive and technical information for each kind of tile. A section on color harmony suggests color combinations using different types of tile. American Olean Tile Co., 1000 Cannon Ave., Lansdale, Pa.*

CIRCLE 406 ON INQUIRY CARD

STAINLESS STEEL
The stainless steel, truss-wall sheathing of the I.B.M. Building in Pittsburgh and the custom windows of the Michigan Consolidated Gas Company Building in Detroit are described in detail in an eight-page booklet. Committee of Stainless Steel Producers, American Iron and Steel Institute, 633 Third Ave., New York 17, N.Y.

CIRCLE 407 ON INQUIRY CARD

LAB SPEC GUIDE
(A.I.A. 35-E) A laboratory fixtures specification guide has detailed reference data on how to select the best fixtures for particular functions. T & S Brass and Bronze Works, Inc., 128 Magnolia Ave., Westbury, L.I., N.Y.

CIRCLE 408 ON INQUIRY CARD

UNIT VENTILATORS
Unit ventilators designed for horizontal mounting at ceiling levels are described in Catalog 1085. All models have a Roll-a-Change filter which holds a three-year supply of filter media. Schenemaner Mfg. Co., Holland, Ohio

CIRCLE 409 ON INQUIRY CARD

CURTAIN WALLS, WINDOWS
(A.I.A. 16-E) Alwintite aluminum windows, curtain walls, slide doors and terrace doors for high-rise apartments, commercial buildings, schools and hospitals are illustrated in catalog. Alwintite Div., General Bronze Corp., 711 Stewart Ave., Garden City, L.I., N.Y.*

CIRCLE 410 ON INQUIRY CARD

RECESSED LIGHTING
Recessed and surface incandescent lighting are illustrated in 40-page Catalog 2000. Footcandle tables, coefficient tables, candle power distribution charts, dimension drawings and product specifications are included. Moe Light Div., Thomas Industries, Inc., 207 E. Broadway, Louisville 2, Ky.*

CIRCLE 411 ON INQUIRY CARD

PEDESTAL FURNITURE
Pedestal tables and upholstered and fiber-glass chairs for various residential and commercial uses are illustrated in full-color catalog. Burke, Inc., 510 N. Westmoreland Rd., Dallas 7, Tex.

CIRCLE 412 ON INQUIRY CARD

*Additional product information in Sweet's Architectural File

more literature on page 272
For significant new homes . . .
remarkable new
Armstrong Siding

Here's a siding that stands up better, needs less care, yet retains the beauty of conventional wood siding. It's made from tough wood fibers heat-bonded with resin. It's knot-free and grain-free, so it won't split or crack. It comes in standard straight lengths that saw and nail easily, so it's fast to put up. And it arrives from the factory with two applications of primer; an excellent base for receiving and holding finish paint.

The three types—horizontal lap, vertical grooved, and vertical plain panels—will blend with any style architecture. For further information on new Armstrong Siding, write Armstrong Cork Company, 4104 Rock Street, Lancaster, Pennsylvania.

Armstrong SIDING

For more data, circle 77 on Inquiry Card
Light Your Corridors And Classrooms With Matching

**PHOTOMETRIC PRISM CONTROLLED LUMINAIRES**

Meet the newest member of the Wakefield family of Photometric prism controlled luminaires—the Photocor one lamp unit for corridors. This, together with the two and four lamp Photometrics, gives you a complete series of matching luminaires for classrooms and corridors. Available in 4 ft. and 8 ft. lengths, Photometrics when mounted in rows provide a continuous shaft of light since they have no metal end plates to create distracting shadows. Write for literature describing these efficient prism controlled luminaires.

One lamp PHOTO-COR is an ideal prism controlled luminaire for corridors.

Two lamp PHOTO-METRIC is recommended for classrooms and offices.

Four lamp width equipped with two lamps provides optimum seeing quality with low brightness.

Four lamp PHOTOMETRIC is recommended for office and school areas requiring high intensity.

Matching refractors of acrylic or styrene, removable from either side.

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**WAKEFIELD CORPORATION**

Vermilion, Ohio

In Canada, Wakefield Lighting Limited, London, Ontario

For more data, circle 78 on Inquiry Card

For more data, circle 79 on Inquiry Card
just what the doctor ordered
FOR CUSTOM DESIGNS

The freedom of choice in Miseramic's colors, sizes, patterns and custom designs in genuine ceramic tile provides an inspiration for nearly any wall, floor or building surface. Check the Yellow Pages or write Miseramic for the name of your distributor today.

Miseramic Tile
Cleveland, Mississippi
INSTITUTIONAL KITCHEN VENTILATION
Institutional kitchen ventilating system fights grease fires with AIRSAN AG grease filter that arrests flames, absorbs heat and reduces exposed flames to temperatures below the fire point. A thermal-link that melts in case of fire releases a weighted damper to prevent fire from spreading into plenum area. Manual or automatic carbon dioxide control is available. Air Filter Corp., 4540 W. Woolworth Ave., Milwaukee 18, Wis.

CIRCLE 302 ON INQUIRY CARD

VINYL COATING FOR METALS
Colovin vinyl film for outdoor use can be bonded to almost any substrate. It is said to be colorfast and abrasion and impact resistant. Clad-Rex, Delta-Chicago, Inc., 11500 W. King St., Franklin Park, Ill.

CIRCLE 303 ON INQUIRY CARD

BACTERIA-CONTROLLING AIR DISTRIBUTION PANELS
A combination air-diffuser and germicidal-lamp panel assembly makes possible distribution of air that is relatively bacteria-free. Air entering panel chamber is completely exposed to high-intensity rays emitted from the germicidal lamp and then evenly distributed into the room through perforated metal panels. The Pyle-National Co., 1334 N. Kostner Ave., Chicago 51, Ill.

CIRCLE 304 ON INQUIRY CARD

Application Details
for No. 4003 SMOOTHIE® door closer shown on opposite page
(See diagrams above)
1 In corners a “Smoothie” takes less space than most doorknobs between door and wall
2 Degree of door opening possible depends mostly on mounting, type of trim and size of butt used
3 Arm of “Smoothie” is formed to avoid conflict with almost any trim
4 Joints in arm and shoe make it easy to vary height of shoe as needed for beveled trim
5 Power of closer at latch may be increased or decreased by simply reversing position of shoe

Complete catalog on request—no obligation or see Sweet’s 1963, Section 19e/Lc

LCN
LCN CLOSERS, PRINCETON, ILLINOIS
A Division of Schlage Lock Company
Canada: LCN Closers of Canada, Ltd., P. O. Box 100, Port Credit, Ontario
Modern Door Control by

**LCN**

SMOOTHIE® Door Closers

Immaculate Conception Convent, Peoria, Illinois

Brooks-Miller/Rubinelli, Architects

**LCN CLOSERS, PRINCETON, ILLINOIS**

Application Details on Opposite Page
SISALKRAFT® PAPERS PROTECT CONCRETE FLOORS BETTER THAN ANY OTHER CURING METHOD!

Permits fast, minimum-cost clean-up, too.

☐ Durable, reinforced, waterproof Sisalkraft papers can take abuse... and then some! ☐ Keeps slabs protected during the curing period. ☐ Helps deliver dense, dust-free, clean concrete floors. ☐ Provides frost protection during cold weather pouring. Available in widths up to 8' and special "blankets" up to 26½' wide.

☐ You can do your clients a service by specifying Sisalkraft. ☐ We have a booklet titled: "Curing and Protection for Better Concrete." Write for your copy, today.

Thin-Line Seasonmakers
for saving space
for every application
for McQuay quality

The familiar Thin-Line Seasonmaker family consists of floor, basic, ceiling, and hideaway types, which permits you to select the particular unit to fit your requirements. And because they are only 8½ inches thin, they save space. Seasonmakers are whisper quiet, too, with three-speed fan control for air volume flexibility. Your McQuay representative can help you select the Seasonmaker to exactly meet your needs, or write McQuay, Inc., 1605 Broadway N.E., Minneapolis 13, Minnesota.

McQuay Thin-Line individual room

McQuay Thin-Line SEASONMAKERS

For more data, circle 81 on Inquiry Card

For more data, circle 82 on Inquiry Card

ARCHITECTURAL RECORD April 1963 231
NEW ANEMOSTAT®
AIRPANEL
is an air diffuser

Product Reports
continued from page 228

CERAMIC WALL TILES
Sculptured ceramic wall tiles, 18 by
18 in. and 9 by 18 in., are available in
a variety of patterns with a choice
of colors and finishes. Custom de-
signs can be made from the standard
tiles. Design-Technics, 7 E. 53d St.,
New York 22, N.Y.
CIRCLE 305 ON INQUIRY CARD

FLOOR FOR COMPUTERS
Elevated Free-Access floor for elec-
tronic data processing rooms allows
space underneath for machine cables
and air-conditioning plenum, if de-
sired. The 2-ft-square steel-clad pan-
els lock into a structural aluminum
grid supported by adjustable steel
pedestals. The strong, fire-resistant
panels are finished with vinyl tile.
White Partitions Co., 56 Glenwood
Ave., Hyde Park, Boston 36, Mass.
CIRCLE 306 ON INQUIRY CARD

REINFORCED VINYL SHEET
Kayrex steel reinforced rigid vinyl
sheet, made in a continuous lamina-
tion process, is lightweight with a
high, load-bearing strength. Corru-
gated rolls and flat sheets are avail-
able in white and green transparent
colors. Kaykor Products Corp., Yard-
ville, N.J.
CIRCLE 307 ON INQUIRY CARD

ELEVATOR CAR LIGHTING
Side panels of fiber-glass reinforced
polyester are lighted from behind by
fluorescent tubes to provide illumi-
nation in elevator cars. Back wall,
doors and ceiling are laminated plastic.
Otis Elevator Co., 260 11th Ave.,
New York 1, N.Y.
CIRCLE 308 ON INQUIRY CARD

more products on page 223

is a ceiling panel
to fit a wide
variety of ceiling mountings

△ Adjusting device easily accessible. Unique air-flow control. Capacities: 80 to 260
CFM! △ Attenuator section eliminates excessive system noise. Design assures
minimum maintenance.
**ANEMOSTAT AIRPANEL™** (MODEL AP) IS MANUFACTURED SPECIFICALLY FOR SINGLE DUCT HIGH VELOCITY SYSTEMS. THE COMBINATION OF EFFICIENT AIR DIFFUSION, CEILING MODULARITY, ADJUSTABLE VOLUME CONTROL AND EFFECTIVE SOUND ATTENUATION PROVIDES UNUSUAL VERSATILITY FOR MANY APPLICATIONS. ASK YOUR ANEMOSTAT REPRESENTATIVE FOR THE FULL STORY.

**Product Reports**

*continued from page 232*

**GYPSUM PARTITIONS**

Two cost-saving lath and plaster steel stud systems for nonbearing partitions (one for screw and one for nail or staple application) use one-third fewer studs than other systems, with studs spaced 24 in. on center. Sound transmission loss rating is given as 45 decibels. National Gypsum Co., Buffalo 2, N.Y.

CIRCLE 309 ON INQUIRY CARD

**SOUND-ISOLATING GLASS**

Acousto-Pane sound-isolating glass is made with 2, 3 or 4 plies laminated together with viscoelastic adhesive layers. The construction gives the glass extra strength, rigidity and shatter-resistance as well as sound-isolating properties. It is available also with a gray tint. Amerada Glass Corp., 3301 S. Prairie Ave., Chicago, Ill.

CIRCLE 310 ON INQUIRY CARD

**OFFICE PRINTER**

Varigraph Headwriter, a non-photographic model for setting reproduction-quality headlines can be used on any stock, including paper offset plates. It uses India ink. Varigraph Inc., Madison 1, Wis.

CIRCLE 311 ON INQUIRY CARD

For more data, circle 83 on Inquiry Card

ARCHITECTURAL RECORD April 1963 233
HANDSOME APPROACH TO A MODERN HOME is this distinctive concrete driveway. Concrete offers custom-designed smartness, opportunity for imaginative color and design treatments. Concrete is durable; the beauty lasts.

NEW PATTERNS IN OUTDOOR LIVING — casual or formal — are easily achieved with concrete. The pool serves as the focal point of activity, complementing a warm spectrum of colors and textures in the patio and garden.

Out of the Horizon Homes Program...*distinctive* design ideas with *modern concrete*

Outstanding home design from 1962 Horizon Homes Program features concrete slump block for beauty and textural interest.
Beautiful things are being done, today, with concrete. Typical are the outstanding home designs created by leading architects for the annual Horizon Homes Program, sponsored by the nation’s concrete industries.

Modern concrete opens the way to fresh ideas. Architects are turning to concrete more and more for vital structural elements, as well as for intriguing decorative effects. No other basic material is so versatile or offers the home designer such freedom for innovation. Concrete offers a virtually unlimited range of colors, textures, patterns and shapes.

Architects are finding that concrete readily accommodates the newest concepts in modern living and provides opportunity for distinctive home design. Major design awards are offered in the 1963 Horizon Homes Program. Plan to enter.

**Portland Cement Association**

*A national organization to improve and extend the uses of Portland cement and concrete*

Better living begins when you own a new home

---

For more data, circle 84 on Inquiry Card
Creative use of Andersen Windows accents entry design of 126-unit apartment complex

Stock window units, proportioned in a two-story panel, combine beauty, comfort and dependability

In the new Trenridge Apartments, Lincoln, Nebraska, combination Andersen casement and picture windows are used to complement distinctive styling while adding extra value for owner and occupants.

For the owner, these extra-weather-tight windows (more than 3 times industry standards) will mean significant savings in heating and cooling costs... and lasting tenant satisfaction. And occupants will like the way Andersen wood windows provide weather-tight comfort the year around. (The entire project is equipped with Welded Insulating Glass.)

Andersen's complete line of windows offers maximum design flexibility for your next light construction project. There are 7 kinds of windows, 30 different types, and more than 600 cataloged sizes.

Check Sweet's File or write for Detail catalog and Tracing detail files. Andersen Windows are available from lumber and millwork dealers throughout the United States and Canada.

Andersen Windowwalls
ANDERSEN CORPORATION
BAYPORT, MINNESOTA

For more data, circle 85 on Inquiry Card
PROFESSIONALS IN SOUND
(WESTERN ELECTRIC FOR ONE)

PREFER SOUND SYSTEMS BY ALTEC

Three independently functioning sound systems were required to serve Western's public areas, meeting rooms, and music room. The systems selected had to meet the high standards offered and demanded by Western Electric Company.

In every respect—from reliability to sound quality, from sophistication of design to ease of operation—Altec met Western's standards. Altec sound systems were selected to provide paging, public address, and background music. And, in Western's music room, famous Altec studio playback components provide superb stereo reproduction.

Investigate the solutions Altec offers your sound problems. For the endless variety of services a modern sound system can contribute to most projects, call the nearest Altec Sound Contractor (listed in your Yellow Pages) or write Dept. AR 4.

Altec Sound Contractor to Western: Sound Systems, Inc., New York, N.Y.

The Western Electric Building at 222 Broadway is one of New York City's newest skyscrapers. Housed here are Western Electric Company's general offices.

MOVABLE PARTITIONS

The Kent line of movable partitions has steel sections at floor and ceiling which hold two sheets of gypsum board. These are separated to give an air space which reduces sound and heat transmission and allows room for wiring. Steel hardware connects partitions and is used for doorways and corners. Since no taping or filling of joints is involved, partitions are easy to relocate. Architectural Systems, Inc., 4300-36th St., S.E., Grand Rapids 7, Mich.

ABRASIVE TREAD PLATE

A fine-grained aluminum abrasive tread plate is suited for patio decks, where people walk in bare feet, and for applications where ease of cleaning is important. Aluminum Co. of America, 768 Alcoa Bldg., Pittsburgh 19, Pa.

TEXTURED STAINLESS STEEL

Texture-Stainless is a specially finished stainless steel with a slightly depressed pattern dispersed over the entire surface. It is available stain-rolled, stain-highlighted or colored and highlighted. The steel is recommended for interior use only and is available in Types 304 and 430. Republic Steel Corp., 1441 Republic Bldg., Cleveland 1, Ohio

For more data, circle 86 on Inquiry Card

For more data, circle 87 on Inquiry Card
When you specify flush doors with factory-primed MASONITE DORLUX...
When properly constructed...fewer callbacks for warpage, checking or swelling. Glass-smooth, cockle-free Dorlux will not split, splinter, or check...and with Masonite's factory-applied Primecote, Dorlux may be finished with less paint. Unlike foreign hardboards (and many domestic panels), Dorlux skins meet Commercial Standards (a major point with your builder friend when he goes to arrange financing!).

DORLUX
by MASONITE
BOOM IN STEEL FRAMING FOR MEDIUM- AND HIGH-RISE BUILDINGS ... It began with the introduction of ASTM A36, which slashed the cost of steel construction. Other new, money-saving steel products, plus the revised AISC design specifications, plastic design, and composite design ... all these things have convinced architects to take a second look at the economy of steel construction.

THE DESIGNERS OF BRICKELL TOWN HOUSE, 21-story Miami apartment, report they chose steel framing for economy. Its all-welded A36 frame, designed to withstand hurricane-force winds, is 50 percent lighter than concrete ... saved an estimated 600 foundation piles.

ARCHITECTS FOR THE CRYSTAL HOUSE, Arlington, Va., report "substantial" savings with steel. They used Bethlehem's V50 (50,000 psi-yield) steel for columns through the sixth floor of the 12-story buildings, to keep column dimensions uniform. Balance is A36 steel.

SAVE TIME BY LETTING THE STEEL FABRICATION CONTRACT FIRST. Then the shopwork can speed ahead while foundation work proceeds. Learn the money-saving opportunities in the new AISC "specs", composite design, and plastic design—all approved by building codes of most cities.

NEW STEELS, NEW DESIGN CRITERIA ... make steel framing more economical than ever before. Call in a Bethlehem Sales Engineer when you're in the early design stages. He's a competent professional. He can point the way to savings of time and money. Interested? Get in touch with the Bethlehem Office nearest you.

(Bethlehem Steel Company, Bethlehem, PA. Export Sales: Bethlehem Steel Export Corporation)

For more data, circle 88 on Inquiry Card
Ceramic Mosaics
THE EASIEST TO APPLY, FASTEST FROM CARTON TO

"DOT"© TILE* BY MOSAIC© is possibly the most meaningful development in the history of modern ceramics. The tile is the same but the precision-applied permanent "DOT"© edge-mounting gives both architect and tilesetter new command of the material and new installation time savings. The "beam-like" effect of "DOT"© interlaced edge-mounting preserves strength and uniformity in all three dimensions. Yet, the "DOT'S"© are so flexible that sheets can be rolled up without loosening the tiles. Sheets will not stretch, shrink or sag. (Rolls of ceramic mosaics up to 2'-0" x 6'-0" and longer available on special order in some areas.) "DOT"© Tile can be applied with adhesives or thin-set or conventional mortar bed. "DOT"© ceramic mosaics give a truer level surface on adhesives or thin-set mortar bed because the sheets are made flush on the surface. The all-resin "DOT"© is impervious to moisture (unaffected by soaking, even in boiling water) and remains flexible down to -10°F with no loss of strength. Yet, sheets are easily cut and they shear clean and straight. We share enthusiasm for our "DOT"© Tile product with the
4¼” x 4¼” Wall Tile

(3-tile by 4-tile sheets)

WALL OR FLOOR, OF ANY CERAMIC TILE MADE

many tile contractors who have had good experience with it. When you specify Mosaic “DOT” Tile, you are calling for the most satisfactory tiled walls and floors you have ever known . . . on the best cost basis available today. Call your Mosaic Representative for “DOT” mounted ceramic mosaic patterns and sheet sizes available in your area.

THE MOSAIC TILE COMPANY General Office: Cleveland, Ohio

Member: Tile Council of America, Inc. and The Producers’ Council Inc.

Tuf-flex doors in Bullock's, Santa Ana, Calif., feature specially designed push-pull bars.

Beautiful ways to handle the Open World of L·O·F Glass

L·O·F gives you Tuf-flex® doors to "open" buildings. And new "Custom 300" hardware to open the doors. It's a combination that makes any entrance more tempting to customers. The distinctive new "Custom 300" line harmonizes with modern building decor. Four of the many attractive styles are shown below. Available now in aluminum, bronze or stainless steel. You save time when you choose from this line, but if you wish you may design your own special hardware.

That applies to doors, too. L·O·F makes frame-free Tuf-flex tempered plate glass doors in two thicknesses (1\(\frac{1}{2}\)" and 3\(\frac{3}{4}\)"") and in representative standard sizes and styles. In clear, in 1\(\frac{1}{2}\)" rough plate, and now in 1\(\frac{1}{2}\" Parallel-O-Grey® plate glass.

To get your copy of our booklet, "Custom 300 Push-Pull Bars", call your Libbey-Owens-Ford Glass Distributor (listed under "Glass" in the Yellow Pages of your phone book). Or write L·O·F, 243 Libbey-Owens-Ford Building, Toledo 2, Ohio.
Stays flexible, bonds better!

Dow Corning 780® Building Sealant seals for sure. You can see why.

No other building sealant approaches silicone rubber for retention of flexibility and adhesion. That's the basic reason 780 Building Sealant permanently seals any combination of structural materials under temperature conditions ranging from —30 to 350 F. Note glass to aluminum bond above.

This one-part, premium performance silicone rubber sealant cures rapidly, stays permanently flexible. It can be applied, without pre-heating or refrigerating, from 0 to 120 F. There is no need for job-site mixing, with attendant labor costs and risk of error; 780 Sealant is supplied in ready-to-use polyethylene cartridges to fit standard air or hand operated guns.

Need more convincing? Send for our special prove-it-yourself kit offered in coupon at right.

780 Building Sealant is manufactured and packaged only by Dow Corning Corporation.
MODERN DESIGN Uses WEST COAST LUMBER

WEST COAST DOUGLAS FIR
WEST COAST HEMLOCK • WESTERN RED CEDAR
SITKA SPRUCE • WHITE FIR
This suburban, two-story 9528 sq. ft. building is located a few minutes from the heart of Portland, Oregon. Only standard sizes and grades of West Coast Lumber were used in its construction.

Meeting zoning and building code requirements, the design eliminates interior bearing partitions for flexibility in office space organization. The four walls carry the entire second floor and roof load.

The hillside location resulted in an unusual engineering design feature that places the basement and its foundations as an anchor for the structure. Because wind loads are transmitted through the floors to the central core, exterior columns are load bearing only. Vertical laminated beams extend from the footings to the eaves and are joined at the first and second floor levels by heavier glued laminated beams that span 32 feet.

The framework of the building is composed of 12 frames capped with trusses. The frames are joined at the first floor with 3" x 6" decking; the second floor and roof deck are 2" x 6" heavy flooring.

Rising from below the sunshade at the first floor level to the eaves are support columns of 2" x 6" spaced with a 4" x 4" block. The sunshade built of 2 x 3s provides a walkway for window maintenance in addition to its primary purpose.

Available from local retail lumber dealers are the standard sizes and grades of coast region West Coast Lumber ... an economical first step in creating modern buildings for business.

New! “The Bright New World of West Coast Hemlock,” eight full color pages of application ideas. FREE ... for your personal copy, write:

WEST COAST LUMBERMEN'S ASSOCIATION
1410 S.W. MORRISON STREET
PORTLAND 5, OREGON
What's behind today's new “instant” multiple-ply drywall?

Instantaneous strength, easy application!

Apply this adhesive, let it dry, press the finish ply into place. That's just how easy 3M Brand Drywall Contact Adhesive makes laminating drywall. That's how it helps you achieve the improved strength and acoustics of multiple-ply drywall construction at a 25% saving in installation time!

3M Drywall Contact Adhesive grabs instantly, attains strength “right now.” No shoring needed, even on ceilings. No nails in the finish ply, so there's no chance of popping, no nail heads to spackle. Adhesive affords excellent water resistance, thin glue line — won't creep or flow under load. You can tape and fill seams as soon as panels are in place!

New 3M Drywall Contact Adhesive!

Applies as easy as wall paint—with brush, roller, spray gun or notched scraper. After application, adhesive changes color to indicate when it is ready to bond—and that takes only 5 minutes, although you can wait as long as an hour to complete bond if you wish. Adhesive is water-based, non-flammable. Gallon covers up to 400 square feet of multiple-ply laminate.

For single-ply drywall, 3M Brand Joist/Stud Adhesive reduces nailing by 50% or more, eliminates “drumming” sound when customers knock on the wall. For details about 3M adhesives for drywall (and other 3M construction adhesives), see Sweet's Catalog, your 3M Distributor, or write AC&S Division, Dept. SBHM-43, 3M Company, St. Paul 19, Minn.
Exterior design:  
Welton Becket & Associates, Los Angeles. Architects

Interior design:  
Welton Becket and Associates; Rodgers Associates, New York  
A. Pomerantz & Company, Philadelphia

Radiant-acoustic ceiling installation:  

___

THIS ACOUSTICAL CEILING HEATS AND COOLS

Burgess-Manning/Inland radiant-acoustic ceilings help to control comfort three ways in Scott Paper Company's new Executive Offices and Research and Engineering Center, a multi-million dollar complex located adjacent to Philadelphia International Airport. Ceiling panels provide trouble-free radiant heating, radiant cooling and sound control. The architects specified radiant panel heating and cooling for offices and laboratories because of: (1) its high level of year 'round comfort, (2) its room-wide uniformity of temperature and freedom from drafts, and (3) its flexibility in layout and adaptation to lighting. For a description of radiant heating and cooling principles, along with performance curves, design procedure and other data, see Sweet's, Architectural File, section 11a/In, or write for Catalog 250.

Inland Steel Products Company  
Engineered Products Division

4111 W. BURNHAM STREET, MILWAUKEE 1, WISCONSIN
A wise investment, Terrazzo is inexpensive to install. Modern equipment and newer work methods have greatly reduced the costs of Terrazzo installations. For example, check the versatility of Terrazzo (brochure and specifications upon request)—methods of installation range from sand cushion Terrazzo and bonded to concrete Terrazzo to the more economical type monolithic Terrazzo. An ageless flooring that provides durability and minimum maintenance at a low initial cost, Terrazzo is known for the superb quality and beauty that have made it a luxury flooring throughout history.

Other floors are “softer” to the foot than Terrazzo. False. Resilience with respect to walking on a floor is a measure of the instantaneous yielding of the surface to the impact of the heel and the return to the original surface. The fact that composition tile (usually installed over a concrete slab) will indent under heavy pressure is no measure of its resilience. “Easy on the feet” is only a myth and it is misrepresentation to call these materials ‘resilient’. The American Podiatry Assn. states that even carpet is not good for the feet, as “it is not a natural footing.”

Terrazzo is competitive with vinyl and asphalt. True. Studies prove that initial costs amount to only 1% to 4% of total cost of floor finishes. Maintenance costs are the major factor in the actual expense of a floor. Over a period of ten years, for example, Terrazzo cuts the average costs for office building maintenance from $2.64 a square foot of rentable space to $2.04 a square foot. And in school buildings, over a period of 50 years, Terrazzo cuts the 56.5c cost of maintaining asphalt tile to 35.3c. Documented studies (available upon request*) prove Terrazzo maintenance economies actually save enough to pay the entire construction costs of the floor in 10 years—sometimes in as little as 5 years.

Terrazzo increases noise in heavily trafficked interiors. False. Naturally, good, basic acoustical practices should always be followed. With proper ceiling construction, not only the Terrazzo floors, but the total volume of clatter, voices, and office equipment will be cut to a restful level of sound. Right now, classrooms, airport ticketing buildings, lobbies, offices, even banks and libraries are floored with quiet Terrazzo. Ask to see our “Blue-chip List” of diversified fine quality installations.

Terrazzo patterns fade out over long periods of time. False. Neither sun nor long use can fade Terrazzo patterns. Composed of marble chips and white or gray Portland Cement with color pigment added in some cases, Terrazzo will hold its color and pattern. So permanent are the Terrazzo patterns, that they can be seen on floors that are centuries old throughout Italy where Terrazzo floors originated. To create effective vistas and exciting new effects and permanence of color, marble chips are available in several small, medium and large sizes.

Terrazzo is designed for luxury buildings only. False. Terrazzo is beautiful. And luxurious. But the various types of Terrazzo are adaptable to any building regardless of budget. One of its primary appeals to architects is Terrazzo’s extreme durability under the toughest usage. In fact, Terrazzo floors last the life of a building! This durability, coupled with Terrazzo’s remarkably low maintenance cost (a neutral cleaner and water is all it needs—no waxing or buffing necessary) makes Terrazzo an extremely efficient, economical, and practical floor.

NOTHING LASTS LIKE, LOOKS LIKE TERRAZZO.

*For free copies of the "Ultimate Costs" study and the "Terrazzo Specifications and Technical Data" booklet, write:
NATIONAL TERRAZZO & MOSAIC ASSOCIATION
Suite 503-D, 2000 K Street, N.W. Washington 6, D.C.
"Use Members of NTMA for Quality Terrazzo"
CONTEMPORARY
ROOF DESIGN...

Mississippi Wire Glass Combines Beauty and Utility
Outstanding construction feature of this newly built church results from the perfect wedding of metal and glass. Contributing to its modern appearance, translucent Hammered Misco blends harmoniously with the peaked aluminum roof . . . offers maximum beauty and the proven protection of wire glass while it contributes light, drama, distinction. Achieve the safety and unparalleled beauty of modern design with Misco*. Available in types for clear vision or diffusion wherever quality glass is sold.

* Mississippi's designation for its diamond-shaped welded wire netting.

MISSISSIPPI GLASS COMPANY
88 Angelica Street, St. Louis 7, Missouri
NEW YORK • CHICAGO • FULLERTON, CALIFORNIA
WORLD'S LARGEST MANUFACTURER OF ROLLED, FIGURED AND WIRED GLASS

MISSISSIPPI GLASS...New Look for a New Era

Typifying clean, functional, modern design, distinctive Mississippi figured patterns blend subtly with any interior or exterior. The versatility of Mississippi glass provides architects, engineers and contractors with a practical and economical solution to virtually every daylighting problem including diffusion, decoration, protection and heat absorption. And remember...

New horizons for glass...promise of the future...will come from the facilities of Mississippi Glass Company.

MISSISSIPPI GLASS COMPANY
88 Angelica Street • St. Louis 7, Missouri
Distributors in Principal Cities of the United States and Canada

NEW CATALOG Contains pattern descriptions, light distribution charts and transmission data. Send for your free copy today.

See our catalog in Sweet's.

Coolite, heat absorbing glass controls light and temperatures in Parkway Consolidated School, St. Louis, Missouri. Architect: Schwarz & Van Hoeven, St. Louis. General Contractor: Swan Construction Company.
What can sort the cards if power fails?

**A KOhLER STAND-BY ELECTRIC PLANT!**

Power failure can be costly. It can handcuff the business that depends on automated card punchers, tabulators, sorters, computers. It can be ruinous...reasons enough to include Kohler stand-by electric plants in your power planning.

Kohler plants are equipped with electric cranking through exciter. Roughly translated, this means the fastest possible restoration of power in emergencies. The Kohler claim of exceptional durability and dependability is not a hollow one and it is backed up by an extensive network of factory trained service specialists.

Kohler plants are available from 500 to 170,000 watts, with equipment for completely automatic, unattended takeover in case of power failure. See a Kohler dealer, or write to Dept. EP3-504 Kohler Co., Kohler, Wisconsin.
The Distinguishing Difference
In Beautiful Floors
The World Over
Around the World With

HILLYARD

"MAINTAINERERS"

A silver jet swoops down into the humid tropic atmosphere of a Guam air strip. Among the passengers is a Hillyard "Maintaineer," an expert on the curing and treating of concrete, arriving to confer with officials on moisture problems affecting floor and surface treatments.

In Marseilles, France, a young "Maintaineer" explains carefully to custodians how best to preserve their parquet floor three hundred years old, and enhance the beauty of its superb craftsmanship. It is a work of art, entrusted to a Hillyard "Maintaineer" an expert on floor care.

In a West German factory, maintenance engineers, an architect, and a plant manager show scientific interest as a Hillyard "Maintaineer" explains the treatment needed to keep a research laboratory static free and sterile to meet exacting standards.

And half a world away, a group of serious men in Japan listen intently as a Hillyard "Maintaineer" demonstrates approved techniques for avoiding static build-up in a modern Japanese operating room.

Overseas, Hillyard "Maintaineers" like 181 others throughout the United States are schooled in the scientific techniques of floor treatments each has been certified as a Hillyard floor "maintenance engineer" after receiving formal instruction in Hillyard's St. Joseph, Missouri "Maintaineer" Training School.

These are the men who can be invaluable to you in planning labor saving, economical floor treatment and maintenance programs. They will help you put them into action, too, by training custodial personnel or by on-the-job supervision during construction.

You can put a Hillyard "Maintaineer" on your staff without added expense. You'll find his knowledge and advice a sure way to savings. Call the "Maintaineer" near you soon.

Hillyard Maintaineers and Products Perform in World Markets!

Quality speaks for itself in any language

From Germany to Japan, Guam to Switzerland, wherever you go, the Hillyard "Maintaineers" are on the wing and Hillyard products are on the floors. Fact: quality and performance speak a world language — and most persuasively.

Another fact: Hillyard treated floors know no barriers when it comes to climate — temperature, humidity, or unusual traffic conditions. Hillyard products, backed by Hillyard "Maintaineers," can solve any floor care problem in the world. Let us prove it!

Why not put this world-wide experience to work for you? A letter puts a Hillyard Maintaineer on your staff — without obligation. He saves you money and the service is free!

PROPRIETARY CHEMISTS SINCE 1907

For more data, circle 99 on Inquiry Card
History-making advance! New Gas unit is designed to outlast the building it cools and heats.
IT'S ARKLA'S NEW 15-TON GAS UNIT

Reasons for its phenomenal promise of performance. No moving parts to wear out or break down! The DF-1800—Arkla's new 15-ton Gas absorption unit cools and heats automatically—without a boiler or compressor. It never needs lubrication or refrigerant added. Operates at peak capacity throughout its long life. What's more, it is exclusively powered by Gas—the most efficient, dependable source of energy for air conditioning. For all the facts about this supreme achievement in year-round gas comfort cooling and heating, contact your local Gas Company. Or write Arkla Air Conditioning Co., 812 Main Street, Little Rock, Arkansas. □ FOR COOLING & HEATING... GAS IS GOOD BUSINESS.

AMERICAN GAS ASSOCIATION, INC.
For better looking, longer lasting

**SCHOOL FLOORS**

For Hydroment*, 1671 sq. ft. hydroment

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**Specify and install**

**Hydroment®**

...HARDENS, DENSIFIES and COLORS CONCRETE

IN 9 POPULAR COLORS:

- TILE RED
- TAN
- TERRA COTTA
- FRENCH GRAY
- GREEN
- BROWN
- GRASS GREEN
- BLACK
- WHITE and NATURAL

Hydroment is a specially formulated cementitious material which imparts hardness, density and corrosion resistance to concrete floors. Applied by the dust coat method when concrete slabs are poured, Hydroment requires no additives or mixing; it is odorless, waterproof and non-toxic. It has been effectively used in hundreds of indoor and outdoor installations, including schools, hospitals, churches, motels, shopping centers and recreation areas. Write for brochure and color card.

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**Product Reports**

*continued from page 238*

**ACOUSTICAL COVERINGS**

**OF URETHANE FOAM**

Acous-Decor acoustical wall and ceiling covering, made of Reeves Brothers’ Curon urethane foam, is available in two sculptured patterns as well as a plain surface. The foam is available in both tiles and rolls. Non-static surface does not attract dust.

*Hicks and Otis Prints, Inc., 49 W. 33d St., New York 1, N.Y.*

CIRCLE 315 ON INQUIRY CARD

**WALL SYSTEM**

Wall system uses ¼-in.-thick panels with melamine laminated Parkwood finish on both sides. Exposed decorative moldings are anodized aluminum, either black or natural finish.

Laminates are available in a variety of veneer reproductions, printed patterns and solid colors. *Parkwood Laminates, Inc., 134 Water St., Wakefield, Mass.*

CIRCLE 316 ON INQUIRY CARD

**COLORED PLASTIC IMITATES STAINED GLASS**

Plexiglas® is used for making stained “glass” windows, with the leading effect placed so it will not interrupt the design. Individual sections can be as large as 10 by 12 ft without need for steel reinforcing or supporting bars.

*Grant Smith & Assoc., 147 E. 50th St., New York 22, N.Y.*

CIRCLE 317 ON INQUIRY CARD

**TILE-LIKE COATING**

Tile/Gard, an epoxy-based coating for use on all interior building surfaces, has a high-glaze, ceramic-like finish with a high resistance to impact damage, cracking and chipping.

*Detroit Graphite Co., Valspar Corp., 7701 W. 47th St., Lyons, Ill.*

CIRCLE 318 ON INQUIRY CARD

more products on page 264
THE ULTIMATE IN floor type closers

FOR ENTRANCE • VESTIBULE • INTERIOR DOORS

Adjustable BACK-CHECK • CLOSING and LATCH SPEEDS
SPRING TENSION • HOLD OPEN

Test-proven to keep doors in constant check under extremes of wind and draft.

No. 28
CENTER HUNG

For more data, circle 102 on Inquiry Card
New Day-Brite MARKSMAN®
...superb choice for schools and offices

On target for low-brightness comfort, sleek appearance, easy servicing

A direct-indirect unit with approximately 50% uplighting, the Marksman incorporates semi-encased lamp design for cooler operation, greater efficiency and low brightness.

In keeping with its modern lines (less than 3 inches thin overall), the Marksman is suspended with new slimmer design adjustable hangers that go up incredibly fast.

To speed maintenance the enclosure opens easily with a trigger latch and service chain at each end.

Available now in 2- or 4-lamp units, 4 or 8 feet long (8 feet in 2-lamp only). For information, call your Day-Brite representative or distributor, or write Day-Brite.

DAY-BRITE
A DIVISION OF EMERSON ELECTRIC
DAY-BRITE LIGHTING, ST. LOUIS, MO., TUPELO, MISS., SUNNYVALE, CALIF.
NATION'S LARGEST MANUFACTURER OF COMMERCIAL AND INDUSTRIAL LIGHTING EQUIPMENT

Wm. B. Ittner, Inc.
Architects and Engineers
PRICED FOR EVERY HOME AND APARTMENT!

Slim, satin finished, forever beautiful windows of stainless steel—the material that behaves most like glass! Timeless resistance to dirt, acids, alkali. FREEDOM from pitting, corrosion, discoloration, cracking, chipping, flaking—for life. FREEDOM from painting, peeling, ever, and cleanable by washing. FREEDOM from warping, swelling, shrinking, sticking; with rugged reinforcement, machine mitered corners, built-in permanent waterproofing. FREEDOM from heat loss, cold transmission—trapped-air framing plus double glazing eliminates need for storm windows. FREEDOM to blend with colonial, contemporary, or modern architecture—any material or color. Double-hung, single-hung, horizontal slider types. Unique, integral folding fins snap in place for nailing—removable for anchored or mullion type installation.

For freedom from window worries like you've never known before—for freedom from window care for your clients—make yours FREEDOM WINDOW, all the way! Write for literature, or ask your Republic representative, today!

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MANUFACTURING DIVISION
Dept. AR-6238 • YOUNGSTOWN 5, OHIO

For more data, circle 103 on Inquiry card
New booklet tells how you can save on industrial and commercial construction

Here's must reading for every owner and architect faced with a choice between "fire-resistant" and "non-combustible" construction.

This authoritative study examines all cost factors: (1) Capital outlay for the structure, (2) Interest savings, (3) Tax benefits, (4) Insurance savings... tells how to achieve better fire and business protection with a lower capital investment.

Charts and tables show typical costs and savings which can be realized in an "average" factory, warehouse, shopping center and school with sprinklered, noncombustible steel deck construction.

Get your free copy, now, from:

Metal Roof Deck Technical Institute, 53 W. Jackson Blvd., Chicago 4, Illinois.
Presenting...
ASTRO-AIR®
diffusers

★distinctive  ★decorative  ★practical

ASTRO-AIR diffusers present a distinctively different concept in air diffuser design created for the discriminating architect and interior designer. The aesthetic starlike design with etched aluminum finish (or any color desired) will enhance the most attractive interior without calling attention to the mechanical installation. Built-in anti-smudge mounting pan minimizes any possible ceiling dirt streaking. The unusual pattern of ASTRO-AIR Diffusers provides high induction air streams and distributes blended air without drafts in the area served.

Ask for catalog.  AIR DEVICES INC. 185 MADISON AVENUE, NEW YORK 16, N.Y.
BETTER PRODUCTS FOR...AIR DISTRIBUTION • AIR CLEANING • AIR EXHAUST

For more data, circle 106 on Inquiry Card

ARCHITECTURAL RECORD  April 1963  265
ONE RESPONSIBILITY
from manufacture through erection

Frame type wall panels for the Leader Federal Savings and Loan were manufactured, delivered, and erected by Martin Marietta. One source — one responsibility.

MARZAIC®
CURTAIN WALL PANELS
today it's unlimited elevator automation

—and almost instant elevator service. Still further advances in AUTOTRONIC® elevating. A constantly alert supervisory system keeps elevator service matched to traffic demands—continuously! Thru unlimited elevator automation based upon never-ending 'service sensing'. This 'service sensing' detects all demands for elevator service and transmits them continuously to the computer—the 'brain' of the installation in the elevator machine room. This data is projected against current elevator performance to reach immediate command decisions. Then, these decisions are converted into signals that direct the elevators to provide the world's most advanced elevator service. Once again, it's leadership by OTIS. Otis Elevator Company, 260 Eleventh Avenue, New York 1, N. Y.
Whether your needs call for doors high or wide, big or small, standard or special, Kinnear Rolling Doors offer more advantages than any other type of closure. They save time, cut costs, increase protection and add a neat clean-cut appearance to any structure.

Kinnear Doors open straight upward, clearing the entire doorway—floor, wall and overhead space, inside and outside the building is always fully usable. When closed, their interlocking all-metal slat curtain gives extra protection against intruders, vandals, wind, weather and fire. And, with Kinnear’s power operator you can have efficient push-button control from any number of convenient locations!

Extra heavy galvanizing and Kinnear’s Paint Bond insures many extra years of carefree service life. More important, your Kinnear Doors will never be obsolete—every door is REGISTERED—full details and drawings are kept in Kinnear’s fireproof vaults. This makes replacement parts readily available for even those doors with a half century or more of service. Write today and get all these benefits with Kinnear Rolling Doors to fit your needs!

For more data, circle 108 on Inquiry Card

Office Literature continued from page 224

DECORATIVE LUMINAIRES
Decorative aluminum fixtures for use in high ceiling applications, such as lobbies, schools, churches and auditoriums, are described in folder. The unit can be used with incandescent and mercury lighting. The Jones Metal Products Co., Abolite Lighting Div., West Lafayette, Ohio
CIRCLE 413 ON INQUIRY CARD

SOLID VINYL TILE
(A.I.A. 23-G) Eight page booklet illustrates and describes 89 color combinations available in solid vinyl tile. Reference chart shows suggested uses for each pattern. Vinyl Plastics, Inc., 1825 Erie Ave., Sheboygan, Wis.
CIRCLE 414 ON INQUIRY CARD

MOTEL DESIGN
How six architects designed six different Holiday Inn motels using precast concrete Flexicore floor and roof slabs is described in 16-page booklet, with illustrations and detailed drawings. The Flexicore Co., Inc., 1932 E. Monument Ave., Dayton 2, Ohio
CIRCLE 415 ON INQUIRY CARD

MAKE-UP AIR HEATERS
A new line of direct-fired make-up air heaters in capacities from 6,000 to 300,000 cfm is described in Bulletin MU. Campbell Heating Co., 3142 Dean Ave., Des Moines, Iowa
CIRCLE 416 ON INQUIRY CARD

DIMMER CONTROLS
Brochure gives details on electronic dimming controls available for incandescent and fluorescent lights. Hunt Electronics Co., 2617 Andjoh Drive, Dallas 20, Tex.
CIRCLE 417 ON INQUIRY CARD

PREFAB BUILDINGS
Uniframe prefabricated buildings are illustrated in 12-page booklet. Steel framework components are welded together. Varco Steel, Inc., P.O. Box 781, Pine Bluff, Ark.
CIRCLE 418 ON INQUIRY CARD

*Additional product information in Sweet’s Architectural File

For more literature on page 272

268 ARCHITECTURAL RECORD April 1963
new **Homeshield** PRE-HUNG FOLDING DOORS

eliminate costly installation labor of on site assembly and painting

Yes, these new folding doors can be installed in less than 10 minutes. They are pre-hung in a pre-finished aluminum frame. All hardware is installed. Door panels are finished in Oyster white, no need to paint. Doors are packaged as one integral unit ready for immediate installation! Even trim is included!

The beauty of the doors speaks for itself. Now you can select from 4 decorative patterns, any of which will add a new, distinct and decorative focal point to any room, whether modern, contemporary or traditional. Ideal for homes, offices, motels, apartments.

Operative features include new patented spring hardware that permits full access to closet opening. This feature also assures quiet operation, prevents sagging and holds doors positively in open or closed position. Doors have been fully tested and proved to withstand abuse, humidity and temperature extremes.

The cost? **COMPETITIVELY PRICED!** The installation savings and customer satisfaction? **PRICELESS!**

For more information and full specifications write today.

**AMERICAN SCREEN PRODUCTS COMPANY**
Chatsworth, Illinois • Dept. AR-4
HOSTESS "CONTRACT" TABLET ARM (Model HC-304) ••. cushioned seat and backrest, 6 colors in silk-textured vinyl. Also available without tablet arm

Contemporary classic... with a world of seating comfort

KRUEGER/Hostess

oval tubular steel folding chairs

With "Decorator" and "Contract" Chairs, Krueger offers both quality and economy models to fit your clients' needs — distinctive designs which meet today's demands for comfort, durability, and functional flexibility. Krueger "Hostess" Chairs feature the sound engineering of X-frame construction, fold-away convenience for easy handling, and generous upholstered comfort in backrest and seat. Select from a wide range of mix-or-match colors that blend so well with the five frame colors — truly a decorator's delight.

HOSTESS "DECORATOR" (Model HD-404) •• foam-cushioned comfort ... smart texture-woven fabric in eight colors.

Picking the right fixture for the right spot in an industrial or institutional building plan makes the plumbing installation operate the way you designed it. T&S offers the widest range of quality plumbing specialties to choose from for every job in the building... and all the working tools architects and specifiers need to make plans easy, foolproof, quality controlled.

Complete Line Of Fixtures. The T&S complete line of “streamlined” plumbing specialties simplifies the planner's task of unit integration and quality controlled performance throughout his specifications. A full complement of quality-built T&S fixtures and service outlets for every purpose helps him to select the most suitable units for each location... Food Service, Drinking and Filling, Sanitation and Maintenance, Laboratories, and other specialized areas. When you specify T&S, you have positive insurance of reliability and service harmony “all-through-the-house”.

Complete Set Of Planning Guides. T&S offers a two-volume library of specification manuals to the planner. They are fully detailed with exact specs and dimensional drawings of all stock fixtures and service outlets with variations to custom design every layout. Personalized, registered manuals of “Plumbing Specialties” and “Lab-flo Laboratory Service Fixtures” are available on request.

Quality Plumbing Specialties Exclusively Since 1947

Refer to 1963 Sweet's Catalog, Code: 35b Ta

T&S BRASS AND BRONZE WORKS, INC.
128 Magnolia Avenue • Westbury, L. I., N. Y.
Area Code: 516 / Edgewood 4-5104

For more data, circle 110 on Inquiry Card

PRE-RINSE • GLASS FILLERS • WATER STATIONS • FAUCETS • PEDAL VALVE & SERVICE FITTINGS • POT FILLERS • KETTLE RACKS • SPRAY HOSES • ACCESSORIES • LAB-FLO LAB. SERVICE FIXTURES

For more data, circle 111 on Inquiry Card
The Gold Bond difference: Low-cost Asbestone panels decorate both exteriors and interiors...and never need paint

Just the thing for commercial or factory buildings. New Gold Bond 1½" Asbestone exterior panels have prefinished, Ripple-Tone textured, asbestos-cement facings on both sides, laminated to a wood fiber insulating core. The Plasti-Clad surface is an oven-baked, polyvinyl chloride coating, guaranteed for ten years against peeling, blistering or crazing. New Gold Bond 1½" Asbestone interior panels come with your choice of three cores: Spiral-Core, made with rigid, light, precision-cut hardwood spirals; a noncombustible core; a standard wood fibre core. The handsome, pebble-textured Plasticrylic® finish is practically maintenance-free. Six beautiful colors for exteriors. Six more for interior panels, or uncoated for on-the-job painting. Samples are yours for the asking. Call your Gold Bond® Representative, or write to Dept. AR-43, National Gypsum Company, Buffalo 25, N. Y.

Gold Bond materials and methods make the difference in modern building.

For more data, circle 112 on Inquiry Card
DIEBOLD VUE-MATIC PROVIDES NEW DRIVE-IN BANKING DESIGN FLEXIBILITY

Diebold Vue-Matic banking brings you a versatile new tool to use in planning drive-in banking service. Vue-Matic banking combines closed circuit television with pneumatic conveyors... is the most advanced television banking system available today. The story of Diebold Vue-Matic banking's many advantages is a big, significant one. Use coupon for details.

Office Literature
continued from page 268

FOLDING DOORS

(A.I.A. 16-M) Sound control ratings in various settings and installation examples of folding doors and room dividers are given in 12-page catalog. Clopay Corp., 1400 Academy, Detroit 20, Mich.*

CIRCLE 419 ON INQUIRY CARD

GAS-Fired HEATERS

Gas-fired unit heaters and duct furnaces are described in eight-page catalog. Westinghouse Sturtevant Div., Hyde Park, Boston, Mass.

CIRCLE 420 ON INQUIRY CARD

CONCRETE CONSTRUCTION

Articles on new concrete buildings, cold and hot weather concreting on dam construction and the importance of aggregates in floor construction are in a 32-page outsize booklet, C-62-2. The Master Builders Co., Martin-Marietta Corp., Cleveland 18, Ohio*

CIRCLE 421 ON INQUIRY CARD

DESIGNING WITH GLASS

"Creative Ideas in Glass" illustrates recent buildings using glass to achieve a sense of spaciousness. American-Saint Gobain Corp., Box 929, Kingsport, Tenn.*

CIRCLE 422 ON INQUIRY CARD

SUN SCREENS

Octalinear grills for solar screens, decorative grills and building refacings are illustrated in six-page booklet. A wide assortment of grill components can be used to make a unique design. Construction Specialties, Inc., 55 Winans Ave., Cranford, N.J.*

CIRCLE 423 ON INQUIRY CARD

FREE FORM ROOFING

Data file gives information on Ply-O-Glass glass fiber coatings and roofing systems which use chopped glass fiber sprayed on substrates in combination with synthetic rubbers or a solvent asphalt mastic. Ply-O-Glas Co. of America, 50 Cutter Mill Rd., Great Neck, N.Y.

CIRCLE 424 ON INQUIRY CARD

*Additional product information in Sweet's Architectural File

more literature on page 284
NEWS FOR ARCHITECTS!

BARRETT OFFERS YOU VINYL BUILDING PANELS FOR NEW SHAPES, NEW COLORS, NEW DESIGNS

This all-weather pool enclosure in New Jersey can be quickly disassembled for summer.
Arched bus stop shelter demonstrates panel flexibility.

Long Island shopping center canopy provides all-weather protection.

Achieve unique designs like this unusual tennis court.

Decorative vinyl panels also resist weather, salt air, moisture.

PUT MORE LIGHT IN YOUR DESIGNS WITH

What you see above are a number of unique structures, incorporating the first plastic structural building material ever to achieve an Underwriters’ Laboratories flame-spread rating of 25! The material... Barrett vinyl building panels. These panels have virtually unlimited uses in commercial and industrial applications. Look again! See how natural light, combined with eye-catching color, has been integrated as a functional part of each design. The new, longer lengths and
Panels resist fumes in Baton Rouge chemical plant.

Longer length panels can be arched for unusual shapes.

Vinyl panels provide free light in plant storage areas.

Arched panels are easily secured by cable tie-down method.

BARRETT NON-COMBUSTIBLE VINYL BUILDING PANELS

Increased flexibility of colorful Barrett vinyl building panels provided these results. These panels are currently available from building products and plastics distributors in 22 states, including the Pacific coast for the first time. They have been approved by approximately 130 key cities in 38 states. The cities include many operating under major regional building codes such as BOCA, Uniform Code, National Building Code and Southern Building Code.
FREE FOR ARCHITECTS...AN EXCITING NEW BOOK
ON STRUCTURAL DESIGN WITH COLOR AND LIGHT

New Barrett vinyl building panels now make practical highly imaginative concepts which would have seemed fantastic only a few years ago. What direction some of these applications may take is indicated in a new design-idea book for architects created for Barrett by architect William B. Gleckman.

This new design-idea book will show you imaginative and advanced structures...complete detailed information and performance data that take full advantage of Barrett vinyl building panels. And now with the Underwriters' Laboratories flame-spread rating of 25, these buildings can meet code specifications.

Combine your creative talents with Barrett vinyl building panels and discover the profitable advances in design and construction you can achieve. To get an idea of the almost limitless architectural possibilities Barrett vinyl panels offer, send today for your copy of this valuable design-idea book..."Design with Light and Color."

The book is designed specifically for architects; please write on your firm's letterhead. Write to Allied Chemical Corporation, Barrett Division, Dept. AR5, 40 Rector Street, New York 6, N. Y.

Get the news from your man from Barrett! He has been especially selected and trained to help you. He is qualified to discuss technical problems and application procedures, and will keep you ahead on the latest chemical and plastic building materials.

See our catalog on vinyl products in Sweet's.

Barrett is a registered trade mark of Allied Chemical Corporation.
Now a **1½-hour-rated** fire barrier can be beautiful, too

You can now use decorative doors throughout an office building, hospital, school, hotel, or any structure requiring special provisions to meet fire hazards. Weldwood® Fire Doors are available for Class "B" openings requiring a fire barrier rated for 1½ hours. As with other Weldwood Fire Doors, you can specify the face and finish you want, to integrate all doors with your over-all design.

These new 1½-hour-rated Fire Doors retain the incombustible Weldrok® core used in other Weldwood Doors. The cross banding under the face is an inorganic material instead of hardwood. And the rating on the label is different. Otherwise, they offer the same appearance and dependable performance you expect from Weldwood Doors. And, of course, they have an extremely low rate of heat transmission. This provides a substantial margin of safety in the reduction of fire spread.

Furthermore, the new 1½-hour-rated Fire Doors may be included in a complete schedule of Weldwood Doors, supplied machined and finished to your specifications.

For technical data on the new fire doors and complete information on all Weldwood doors, send in coupon on the opposite side of this page.

**NEW WELDWOOD® FIRE DOORS**

*Products of United States Plywood*
Let your imagination go—to one of our more unusual woods
(For example: our pecan architectural paneling)

It doesn’t come from the small orchard tree. The veneers on the paneling above are cut from the pecan which is a big forest tree, related to the hickory. This golden brown wood has a variety of interesting figures to make a distinctive paneling.

Then, there’s pale brown butternut—a satiny wood with a figure that resembles the grain of American walnut. And English brown oak, ranging from nut brown to deep brown. Or Paldao with its variable light brown background and black to brown streaks.

The more familiar native woods also yield outstanding architectural-grade veneers in lighter colors—white birch, some American cherry, curly maple, white maple, white oak, and rift white oak.

It’s easy to get what you are looking for in Weldwood Architectural Paneling. All you have to do is decide the color and the general character of the wood you want. A United States Plywood Architects’ Service Representative will assemble samples of veneer flitches having the length and quantity required. Just call your United States Plywood office.

For complete information about Weldwood Architectural Grade Paneling send in the coupon at the left.
Put construction costs in other parts of your building—not in cost of concrete column forming.

Construction time for columns is cut to a minimum by Sleek/forms. They can be cut to size quickly, set up and secured easily, will not bulge or buckle, strip fast. The special plastic coating inside leaves a smooth, clean column requiring little clean-up. Fibre-constructed Sleek/forms are available in a range of standard square and rectangular sizes. Special shapes and sizes on request. For free information, write:

ALTON BOX BOARD COMPANY. • Building Products Division. • Alton, Illinois

For more data, circle 115 on Inquiry Card

For more data, circle 116 on Inquiry Card
National Gypsum Company is pleased to announce that TECTUM now carries the Gold Bond Label

(more than 100 research scientists voted their approval)

Tectum has enjoyed phenomenal acceptance. More than 500 million board feet have been used to date. It was Tectum that pioneered the principle of open roof deck construction. In the past decade, Tectum has provided appreciable economies in the construction of sorely needed educational, commercial, industrial and religious buildings.

Recently, over one hundred Gold Bond research scientists had a part in thoroughly testing Tectum . . . in evaluating its past performance, in projecting its future. When their work was complete they voted unanimously for its inclusion in the Gold Bond family of building products.

We at National Gypsum Company are immensely proud of this latest addition to our growing family of building materials. Tectum wood fiber products add depth to the Gold Bond line, broaden our representation in the market, and amplify our services to you as an architect.

The thousands of architects, engineers and designers who already know Tectum first-hand can now specify it with even greater confidence. This is because today's Tectum wears the Gold Bond label. And it's backed by Gold Bond research. National Gypsum Company, Buffalo 25, New York.

Gold Bond®
BUILDING PRODUCTS

The lights burn late at the Gold Bond Research Center, Tonawanda, N.Y.

GOLD BOND MATERIALS AND METHODS MAKE THE DIFFERENCE IN MODERN BUILDING

For more data, circle 117 on Inquiry Card
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Nothing lasts like glass. That's why the lighting panels in this new corporate headquarters office won't crack, warp, sag, buckle, or dis-color—ever. This is the permanence of glass that holds maintenance to a minimum—forever.

The glass is our Pattern #70 because it provides high lighting efficiency and brightness control. Its prismatic design gives both—ample worksurface illumination without the glare that tires eyes.

Specify permanent good light and permanent good looks in your next building with Pattern #70. Be sure to ask your fixture manufacturer about the significant new economy of Pattern #70. Building Products Dept., Corning Glass Works, Corning, N. Y.
CLOPAY'S newly published sound brochure answers dozens of questions about proper application of sound to folding partitions

Free to architects and those responsible for the specification of folding partitions, "Some Thoughts About Sound" covers both technical and practical aspects of sound control.

Subjects include Testing Procedures, What Types of Folding Doors Can Provide Sound Control, Practical Facts About Sound, Construction Shortcomings and Pre-Planning for Sound Control. The brochure is liberally illustrated with charts and drawings.

Send today for your free copy. Use the convenient coupon below.

Office Literature
continued from page 272

FLOODLIGHT
(A.I.A. 31-F-22) A floodlight with rectangular beam, with sharp cut-off at all edges, is described in bulletin. Location of the center of intensity is adjustable. Infranor of North America, Inc., 742 Worthington Ridge, Berlin, Conn. 
CIRCLE 425 ON INQUIRY CARD

METAL LETTERS, FIGURES
Eight type faces for letters and nine for figures are illustrated in eight-page booklet. Five finishes in bronze and aluminum are available. H. W. Knight & Son, Inc., 8 Lane St., Seneca Falls, N.Y. 
CIRCLE 426 ON INQUIRY CARD

DESIGNING WITH FOAM
Six structures using rigid urethane foam as a structural material are shown in 18-page booklet. Mobay Chemical Co., Penn Lincoln Parkway West, Pittsburgh 3, Pa. 
CIRCLE 427 ON INQUIRY CARD

AIR CONDITIONERS
Mechanical and engineering specifications and capacity and system data for self-contained, factory-wired packaged air conditioners of 20- to 60-ton capacity are given in 28-page manual, No. 96-570C. Acme Industries, Inc., 600 N. Mechanic St., Jackson, Mich. 
CIRCLE 428 ON INQUIRY CARD

CERAMIC TILE APPLICATION
Specifications for the application of ceramic tile to metal lath and plaster surfaces are given in folder. Metal Lath Association, Engineers Bldg., Cleveland 14, Ohio 
CIRCLE 429 ON INQUIRY CARD

VERMICULITE PLASTER
(A.I.A. 21-A-5, 39-B-C) Four vermiculite plaster systems are discussed in eight-page booklet PA-60, Zonolite Co., 135 S. LaSalle St., Chicago 3, Ill. 
CIRCLE 430 ON INQUIRY CARD

*Additional product information in Sweet's Architectural File
more literature on page 288
steel is good...but Micarta's better

To simulate the digs and scrapes, partitions get in use, make the coin test. On almost any painted partition surface, the edge of the coin will cut through the finish. Try it on MICARTA plastic laminate and bear down hard. You'll find it difficult to leave any mark at all.

A good baked enamel finish on steel will take its share of hard use before repainting is necessary. But MICARTA takes years of scratches, scuffs and mars and stays looking new without major maintenance...of any kind.

Partition systems offer you significant advantages, among them complete visual design freedom and a wide range of core and facing materials...including Westinghouse MICARTA. By comparing MICARTA with steel, longtime standard among partition materials, Architectural Systems, Inc., points up these immediate and long-range benefits:

Vastly superior resistance to scratches, scuffs, and stains. Not only does MICARTA withstand digs, scrapes and mars, it laughs at detergents and alkalis...at greases and stains of almost any kind. Partition surfaces stay looking fresh and new, year after year, with an absolute minimum of maintenance.

Greater flexibility for fresh new effects in interior design. In addition to a galaxy of modern, decorator colors, MICARTA gives you a wide range of authentic wood grains and textures. Best of all, you can have bright or pastel colors on one side of an ASI partition, a distinctive wood grain on the other. Colors, wood grains and glass can be mixed with a creative freedom no steel partition (and few other kinds) can provide.

Installed costs no more, and often less, than steel...the happiest circumstance of all. We'd welcome an opportunity to relate specific figures to your current project.

All but one of ASI's several basic partition systems are a slim 1 3/4" thick. Fire resistance and sound attenuation can be tailored to meet your most demanding requirements. For details, write or call us at 4300 36th Street, S.E., Grand Rapids 8, Michigan, phone 949-1050, area code 616.

ASI Product Selection Work Sheets, new and important tools for comparing competitive partition systems, are now available. Just mention them when you call or write.

ARCHITECTURAL SYSTEMS, INC.
a division of Westinghouse Electric Corporation

We never forget how much you rely on Westinghouse

For more data, circle 120 on Inquiry Card
ARE STRINGS ATTACHED TO YOUR DESIGNS?

Look closely. There just might be.
This string might well be the laundry facilities that you've included in your plans. And a mighty expensive piece of string it is... one that will keep your client snarled with needless overhead costs.

Why get him all entangled with personnel problems and costs? with expensive-to-buy, expensive-to-main-tain equipment? with costs of electricity, water, supplies and linens?

Unravel the muddle before it starts. Call the linen supply man* nearest you. He'll show you how your client can save money, time and space by arranging for all his linens on a money-saving, pay-as-you-use basis.

He's the greatest little knot-unraveller you'll ever meet!

*See the Yellow Pages under "Linens Supply" or "Towel Supply".

FREE DESIGN GUIDES!
They give case histories and suggestions for providing more efficient linen supply service in motels, hotels, schools, restaurants and hospitals, as well as for commercial firms, professional offices and various institutions. Write today.

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Simplicity. Elegance. Flowing Line. Three good reasons why leading architects for over fifty years endorse Soss Invisible Hinges. When Soss hinged doors or cabinet lids are closed, all hardware is hidden. Unsightly gaps between door and frame disappear. The hinge that hides itself is available in a range of sizes and finishes to add unity to beauty in your next design.

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Office Literature
continued from page 284

COLD-APPLIED ROOFING
(A.I.A. 12-A) Folders describe Kol-orprene liquid synthetic rubber roofing. No perimeter flashing is needed for the lightweight, flexible material. MIRACLE ADHESIVES CORP., 250 PETIT AVE., BELLMORE, L.I., N.Y.
CIRCLE 431 ON INQUIRY CARD

OFFICE LIGHTING
The relationship of lighting to the total office environment, how to assure good lighting, and lighting cost perspectives are given in 24-page technical booklet, TF-114. INQUIRY BUREAU, GENERAL ELECTRIC CO., NELA PARK, CLEVELAND 12, OHIO
CIRCLE 432 ON INQUIRY CARD

PLYWOOD PROPERTIES
A college-level textbook, "Plywood: Properties, Design and Construction," is intended to serve as a basic reference for anyone designing or building with plywood. Such topics as general use recommendations, fastenings, design principles and procedures, basic structural requirements, folded plate methods and space planes are included in the 132-page book. Hardcover copies are $3.00; paperbacks are $2.00. DUGALD F. PLYWOOD ASSOC., 1119 A ST., TACOMA 2, WA.
CIRCLE 433 ON INQUIRY CARD

ALUMINUM STANDARDS
The fifth edition of "Standards for Wrought Aluminum Mill Products" is a 112-page manual which lists properties and dimensional tolerances of aluminum and aluminum alloy mill products. Tables now list strengths in kips (kilopounds) per sq in. instead of pounds per sq in. Single copies available by letterhead request. ALUMINUM ASSOC., 420 LEXINGTON AVE., NEW YORK 17, N.Y.
CIRCLE 434 ON INQUIRY CARD

CHURCH SPIRES
"The Spire" is a 42-page booklet which traces the design of spires from earliest known antecedents, through Gothic, Restoration and Early American periods, to contemporary design. Spires fabricated and erected by Overly are shown in 64 pictures. Included is a check list for determining spire requirements. Available to architects free on letterhead request. OVERLY MFG. CO., 574 W. OTTERMAN ST., GREENSBURG, PA.
Magic? No, copper piping! It installs in less space than cast iron. Specified for the sanitary drainage system in a 15-story hospital on the West Coast,* the space savings in piping areas amounted to 50,000 cubic feet. Think of what this means in reduction of all construction materials. In addition, there was a saving of approximately $40,000 in piping installation costs because copper handles easier, faster. You can pass on such worthwhile savings to your clients if you plan for copper piping in the blueprint stage. You're the key man. Send for illustrated brochure "Why It Pays to Specify Copper." Write Anaconda American Brass Company, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario.

*Location and architects' names on request.

Hospital architects save 50,000 cu. ft. of space without losing one inch of usable room

ANAconda
AMERICAN BRASS COMPANY

For more data, circle 124 on Inquiry Card
Do your door specifications hold water?

They do! ... IF your specifications for overhead-type doors are based on PERFORMANCE STANDARDS. Now, for the first time in the door industry, Barber-Colman Company provides a personalized service that helps you establish door performance standards required by each client. • Called the DOOR SYSTEM ANALYSIS, this comprehensive plan analyzes and appraises door sealing efficiency, section construction, counter balancing reliability, control methods ... all factors affecting materials handling, labor, housekeeping maintenance and other building operating costs. • This plan justifies initial cost of door equipment ... identifies penalty your client will pay with inefficient, inferior quality doors ... determines a firm, accurate budget figure at preliminary planning stage. Write us or ask the Barber-Colman dealer near you for more details on OVERdoors and Door System Analysis.
Flat, corrugated or sandwich-type reinforced panels made with 100% LUCITE® are practical, functional, attractive

Transparent, translucent and opaque panels made with 100% LUCITE® acrylic sirup are the most weather-resistant reinforced plastic panels available. Their resistance to sunlight and moisture is unsurpassed! Based upon the continuous exposure of sheet made from LUCITE for 20 years in outdoor installations, these panels will retain their color, gloss and light-transmission qualities far longer than any other reinforced plastic panels. Panels made with 100% LUCITE® are now available in a variety of patterns and colors. They make effective use of natural and fluorescent lighting to illuminate the interiors of factories, commercial buildings, schools, motels and churches. Their installed cost is less than glass and sash, and they also reduce daytime illumination costs. For information about manufacturers of reinforced panels made with 100% LUCITE® acrylic sirup, write E. I. du Pont de Nemours & Co. (Inc.), Department AR-4, 63-LS, Room 2420, Nemours Building, Wilmington 98, Delaware.

For more data, circle 126 on Inquiry Card
Ventilating Ceilings
continued from page 222

a given type will occur for that obstruction which is nearest the inlet duct opening. However, if there are a number of obstructions between the one causing the most turbulence and the plenum boundary, their aggregate losses may total more than that of the individual obstruction nearest the inlet duct.

The procedures Armstrong developed take into account as a group all of the obstructions of a given type, so as to keep within specified limits the total decrease of plenum pressure due to turbulence around these obstructions as the air moves across the plenum away from the inlet duct opening.

Control of Local Pressure Variations
Local Obstructions and Inlet Duct. For physical reasons similar to those mentioned in connection with static pressure regain, any regions of the plenum carrying exceptionally high air velocities will also be regions where the static pressure, that is the plenum pressure, is lower than the nominal value.

Regions of high air velocity occur where the local obstructions reduce the cross sectional area of the plenum available for air flow. A region of high velocity air occurs also where the air enters the plenum at the inlet duct opening. These regions of high velocity and low pressure are such a small fraction of the total ceiling area that they have negligible influence on the nominal value of plenum pressure for a given total flow to a zone; but care must be taken that the local reductions of pressure do not reach such a magnitude as to cause local negative pressure differences through the ceiling. If negative pressure differences do occur, air will flow upward from the room, through the ceiling, and into the plenum and cause soiling.

Prevention of negative pressure near the inlet duct opening places a restriction on the maximum air inlet velocity, that is the velocity of the air as it leaves the inlet duct opening. For a given total flow of air it is clear that limiting the maximum air inlet velocity is the same as limiting the minimum area of inlet duct opening.

Noise
In the case of a ventilating ceiling any noises conducted through supply ducts are attenuated by the suspended ceiling before entering the room. Also, the terminal noise from diffusers is absent when a ventilating ceiling is used. Finally, there are three new potential sources to consider in the case of the ventilating ceiling; turbulence at the inlet duct, turbulence around obstructions in the plenum, and flow of air out of the ventilating openings.

So far as turbulence around obstructions is concerned, there is no noise problem. The design limitations imposed by demand for uniformity of plenum pressure restrict plenum velocities to such values that detectable noise should not occur.

Noise due to air flowing out of the ventilating openings themselves will not be noticeable so long as plenum pressure does not exceed prescribed limits.

source of pride for Michigan State, all hotel men and Van

- The illustration above shows the regular dining room serving section of the main kitchen of the Continuing Education Building at Michigan State College . . . a part of the W. K. Kellogg Center. The equipment here is only a part of Van's contribution.
- Here and throughout Architect Lewis J. Sarvis of Battle Creek allotted space as Van engineering indicated was required by the unusual problem of serving up to 150 house guests in the hotel and up to 1200 in the banquet room and private dining rooms for the large groups who will come for refresher training.
- Such customers of distinction throughout Van's Century of Service have caused many hotels to rely on Van for food service equipment.

Write The John Van Range Co.,
429 Culvert Street, Cincinnati 2, Ohio
Use Van's century of experience!

For more data, circle 127 on Inquiry Card
Now watertight walls come easier. A special water-repellent additive is now interground with ATLAS MASONRY CEMENT during manufacture. This new feature results in mortar joints with less water absorption . . . facilitates the building of watertight masonry walls. Masons know that Atlas Masonry Cement assures mortar uniformity . . . in workability, color, strength and yield, batch after batch. Everything except sand and water is delivered in one bag. Proportioning errors are minimized. Complies with current ASTM and Federal Specifications. Specify it for your next job. A product of Universal Atlas Cement, 100 Park Ave., New York 17, N.Y.

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For more data, circle 128 on Inquiry Card
Aerofin smooth fins can be spaced as closely as 14 per inch with low air friction. Consequently, the heat-exchange capacity per square foot of face area is extremely high, and the use of high air velocities entirely practical. Tapered fin construction provides ample tube-contact surface so that the entire fin becomes effective transfer surface. Standardized encased units arranged for simple, quick, economical installation.

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

New booklet for the Architect

This is a 20-page engineering report on the most effective structural gasket ever developed for curtainwall construction. For your copy, simply send letter or postcard to The Standard Products Company at the address shown above.

For more data, circle 138 on Inquiry Card

A comprehensive source of design information on multiple dwellings

Here is a magnificently illustrated survey of some of the best recent work in multiple dwellings. More than 50 varied projects by leading architects—ranging from two, three, and four-family buildings up through giant apartment-cities housing thousands of families—are graphically shown in more than 275 photographs and over 200 floor plans and drawings.

The expertly written book gives practical information on important social and design considerations. You find a wealth of up-to-date design information, plus the stimulation of seeing the best efforts of some of today's finest architects.
Architects are applying bold imagination to the design of strikingly beautiful buildings with wood. And no wood gives the architect greater freedom of form and expression than *SPA Southern Pine. Whether it is specified for complex laminated members or conventional framing . . . exquisite paneling or rough sawn siding . . . elegant finish or multi-purpose roof decking . . . this versatile wood assures superior performance.

Here are some outstanding features that lend scope and inspiration to modern design:
- Dimensional Stability Through Proper Seasoning
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SPA technical consultants are available to discuss specifications and uses. For their services write:
Southern Pine Association, P. O. Box 52468, New Orleans 50, Louisiana

*Trade-Marked and Officially Grade-Marked
Novel Idea for '63

The Bi-Level, illustrated above, is a drinking-water accommodation providing a low convenient level for children. It's designed for cabinet-to-cabinet installation (left-side mounting only) on all Halsey Taylor wall-mounted WM-series water coolers . . . available only as a factory-assembled unit.

The Bi-Level is ideal for places where crowds of all ages gather, and especially adapted for school, institutional and shopping-center buildings.

Write for complete specifications.

THE HALSEY W. TAYLOR CO., Warren, O.

For more data, circle 131 on Inquiry Card

OHIO PROJECT WINS A.S.C.E. AWARD

The Ohio River Basin Clean Streams Program, a complex of facilities for pollution control involving eight states, has won the "Outstanding Civil Engineering Achievement of the Year," the fourth such annual award sponsored by the American Society of Civil Engineers.


Given Honorable Mention awards were George Washington Bridge Expansion, Lower Level and Associated Projects, New York, New Jersey; and Whittier Narrows Water Reclamation Plant, Los Angeles County, California.

AWARDS MADE BY OHIO CONCRETE

The Ohio Prestressed Concrete Association has announced award winners for 1962, the outstanding structures built of prestressed concrete. They are: in building design, the new plant of Rubbermaid, Inc., Wooster, designed by Dalton-Dalton Associates, Cleveland; and in bridge design, the new bridge over North Fork of Licking River, Newark, designed by Arthur T. Handel & Associates, Newark engineers.

Judges were Frank Wilson, professor of architecture, Ohio State University; Carl E. Beery, state architect; and D. Henry Overman, chief engineer of bridges, Ohio Department of Highways.

For more data, circle 141 on Inquiry Card
New textured surface...with vaulted contour...at modest prices!

A singularly effective way to add dramatic value to virtually any ceiling... and at the same time achieve high acoustical efficiency! Textured Vault Panels are moulded entirely of fiber glass with an NRC of .75. They are 24" x 24", rising gently to create a 2" vault. As you see above, the surface is made more visually interesting by a low-relief, rippled texture. White-painted at the factory for easy repainting if desired, Textured Vault Panels offer an opportunity to create a sense of height and elegance, as in the gallery above, and in larger institutional or commercial building areas.

Send for more information on the complete line of Johns-Manville acoustical products. Ask for our new booklet, “Sound Control Ceilings”. Address Johns-Manville, Dept. AB, Box 158, New York 16, N. Y. In Canada: Port Credit, Ont. Cable: Johnmanvil.
New dimensional square...New textured surface...New low price!

This new Johns-Manville all-fiber-glass ceiling panel offers a combination of practicality and style...at moderate cost. Square lay-in panels are moulded in inverted coffer shape, projecting 2" downward into the room. As shown above, the visible surface has an attractive, low-relief, rippled texture. Panels are factory-painted white, but can, of course, be repainted to suit any decorative scheme. Measuring 24" x 24" x 2" deep and acoustically effective (NRC of .75)...Inverted Coffer Panels suggest interesting applications in supermarkets and other broad-expansie areas.
ANSWERS TO ARCHITECTS' QUESTIONS ABOUT TEDLAR®
DU PONT'S NEW LONG-LIFE, WEATHERABLE FINISH

What's different about TEDLAR?
TEDLAR® PVF film is a completely new kind of exterior surface. It's not a liquid or a spray; it's a tough fluoride film engineered and manufactured under careful controls by Du Pont.

Has TEDLAR been proven?
In the nearly 20 years of testing behind TEDLAR, we've exposed it to every sort of attack it's likely to get. We know that it resists attack from extremes of climate, ultraviolet light, common acids, alkalis, tars, industrial smog, rust and harsh solvents. It is very hard to stain and easy to clean.

What products are available with TEDLAR?
Manufacturers are now laminating TEDLAR PVF film in a variety of colors to produce built-up roofing systems, residential siding of aluminum and plywood; industrial curtain-wall panels, insulation jacketing; gutters, doors, downspouts, sheet and coil stock.

Who applies TEDLAR?
The manufacturer of a building product. We (Du Pont) make the film and sell it to the manufacturer (of siding, for example), who bonds it to his products in his factory. He uses special Du Pont adhesives, which make TEDLAR part of the material it protects.

How much does TEDLAR cost?
Because TEDLAR is only the finish of a building product, its cost is determined by the manufacturer, not Du Pont. In general, TEDLAR costs slightly more than liquid finishes, but much less than porcelain enamel. Per year of life expectancy, TEDLAR is probably the most economical finish you can buy.

How long will TEDLAR last?
Frankly, we don't know. We haven't been able to wear it out under normal weather conditions. We predict, however, that when properly bonded to a stable material, TEDLAR should be serviceable for 25 years or more without refinishing. It may fade slightly, but chances are you won't notice it.

How can I find out more about TEDLAR?
Write the Du Pont Company. We'll send you more information, a list of manufacturers and bonded samples of TEDLAR. The Du Pont Co., Film Dept., Building Materials Sales Division, Box 50, Wilmington 98, Delaware.

*Du Pont registered trademark

Better Things for Better Living ... through Chemistry
FREE KIT OF TOOLS
WITH IN-SINK-ERATOR
GARBAGE DISPOSER
MAINTENANCE PROGRAM

Now you can be assured that the kitchen's most popular appliance will be maintained by the building's own trained man. This means savings for building owners—and happy tenants, too!

At no charge, In-Sink-Erator will train the building maintenance man, furnish him with a service manual, equip him with the necessary disposer parts... so that he can give tenants on-the-spot service. He will receive free tools to make minor repairs. Any major repairs should be referred to our factory authorized service agency.

The In-Sink-Erator APT model was especially designed for the hard usage it will be given by tenants. It is a great convenience for them too. Now, they can wash food waste down the drain. No handling... no carrying to chute or can. No flies and odors in their kitchens.

For complete information, write

In-Sink-Erator
In-Sink-Erator Manufacturing Co. • 1225 14th St. • Racine, Wis.

Maintenance Program Includes:
• Free Training of the Maintenance Man by In-Sink-Erator
• Necessary Free Parts for On-The-Spot Service
• Self-Service Wrench with Every APT, Model
• Maintenance Program on APT, Model Backed by 1 Year Warranty and Additional 2 Year Parts Protection

For more data, circle 142 on Inquiry Card

CONSOLIGHT®
Combines within a single wall unit all patient room illumination needs as well as all controls and outlets usually found in various locations throughout the walls of a hospital room.

Shown at left is the color corrected, high intensity, low voltage precision examination light that reaches the foot of either bed. Hidden when not in use.

For more data, circle 143 on Inquiry Card

"ACCENT ON COMFORT"

Owner: David H. Finkle • Location: Westport, Conn. • Architect: George Lewis, 200 E. 50th St., New York, N.Y. • Contractor: Thomas J. Rorabaugh Co., Inc., Norwalk, Conn. • Photo: Ezra Stoller

These comfort features found in Miller sliding glass doors —

• POSITIVE WEATHER PROTECTION
• LOW HEATING AND AIR CONDITIONING COSTS
• LONG LIFE
• FREEDOM FROM NOISE
• EASY OPERATION

Remember that your reputation is involved in what you design and build. The lowest possible price might well be the poorest possible economy. Give them the best. Give them a MILLER DOOR—

"Built to Last a House-Time."

14 YEARS IN SLIDING DOOR FABRICATION

For more data, circle 144 on Inquiry Card
Take a close look at the New Carnes Modular Diffusers! They fit flush with the ceiling. Their texture and whiteness blend inconspicuously with any material. That's why you can barely see them, especially when you specify the new slim line or concealed frames.

Carnes Modules are only 6" x 6" in size. They fit practically anywhere — butted to light troffers, between lights, alternating lines with lights, continuous strips around ceilings and columns, along windows, on side walls as returns. Combine these modules into any width or length. How's that for design freedom? Modules come in three different air throws or patterns: one way throw, two way throw or corner throw. In combination, you can direct air in 1, 2, 3 or 4 directions to cover any air handling problem.

Modules are high impact Lexan®. Fire-resistant. Excellent color and dimensional stability. Modules snap in and out of their metal frames (no tools) for changes in air flow, for checking or remodeling. Carnes new slim line frames are only 3/4" to 1/4" wide. Concealed frames for metal-pan ceilings are also available. Start enjoying this new design freedom. Write for Catalog M21K.

HERE'S AN AIR DIFFUSER THAT REALLY GIVES YOU DESIGN FREEDOM
John Ormsbee Simonds, Pittsburgh, Pa. landscape architect and author, has been elected president of the American Society of Landscape Architects. He will assume duties at the close of A.S.L.A.'s 64th annual meeting in Pittsburgh on June 26. Other new officers are: George A. Yarwood, Simsbury, Conn., first vice president; Eugene R. Martini, Atlanta, second vice president; Theodore Osmundson Jr., San Francisco, third vice president; and Walter L. Chambers, Ann Arbor, Mich., secretary-treasurer.

New president of the national Consulting Engineers Council is Sanford K. Fosholt, Muscatine, Iowa. He is to take office next month and serve until May, 1964. Elected with him to serve as national officers are: William W. Moore, San Francisco, first vice president; Henry A. Naylor Jr., Baltimore, Md., second vice-president; Samuel A. Bogen, New York, secretary; Harry Czyzewski, Portland, Ore., treasurer.

Sacramento architect Albert M. Dreyfuss has been elected president of the California Council, American Institute of Architects. He succeeds Wm. Stephen Allen, F.A.I.A., of San Francisco. Other officers elected are: Ulysses Floyd Rible, F.A.I.A., Los Angeles, vice president; Donald L. Hardison, Richmond, Md., second vice-president; Donald L. Neptune, Pasadena, delegate-at-large.


Orville H. Bauer, partner in the Toledo architectural and engineering firm of Richards, Bauer & Moorhead, has been elected president of the Ohio Architects Society.

Edmund Friedman, consulting engineer with Maurice H. Connell & Associates, Inc., Miami, has been elected president of the 49,000-member American Society of Civil Engineers for 1963. Vice presidents for two-year terms elected were: Daniel B. Ventres, Washington, D.C. and Thomas M. Niles, Chicago, Ill. Elected directors for three-year terms were the following: Richard H. Tatlow III, New York; Samuel L. Zack, Harrisburg, Pa.; Ralph B. Peck, Urbana, Ill.; George E. Brandow, Los Angeles; Eugene F. Bispalow, Memphis; Frank H. Newnam, Houston.
A compact, reliable system
Now, there is a fluorescent dimming system that is simple and compact . . .
requires very little installation beyond normal mounting of lighting fixtures . . . and has demonstrated its reliability and highly satisfactory performance in installations from coast-to-coast.

It's General Electric's DS-5000 fluorescent dimming system, specifically designed and engineered for commercial and institutional applications: conference rooms, offices, auditoriums, restaurants, churches, schools . . . anywhere there is a need or desire to vary light intensity.

(We also make the DS-3000, a high-performance fluorescent dimming system for residential applications. If your interest lies in this area, be sure to check GEA-7351 on the return coupon.)

Controls up to 600 lamps
General Electric's DS-5000 system controls up to 600 F-40 rapid-start lamps over a wide dimming range—from full brightness down to 0.3% of maximum light intensity. Lamps operate at full 90-percent light output at maximum intensity setting.

Smooth performance
All lamps in the system start quickly at any intensity setting . . . dim and brighten smoothly in complete unison, without steps or flicker . . . and operate with stability even at lowest settings.

Responsibility for control components
All control components of the DS-5000 system are designed, manufactured and warranted by General Electric. They include (see photo): (A) a dimming ballast for each lamp; (B) a dimming auxiliary for every six dimming ballasts; (C) an intensity selector which controls up to 100 auxiliaries and 600 lamps. (Incidentally, this is the first time a single manufacturer has assumed warranty responsibility for all control components in a commercial fluorescent dimming system.)

Easy installation
Simply install the fixtures, which include the dimming auxiliaries and ballasts. Mount the intensity selector in a standard, three-gang wall box, and connect to the dimming auxiliaries. It's that easy!

Multi-point control
If desired, relays permit operation from more than one location. Additional relays allow lamp load to be split and sections to be controlled independently—especially desirable in rooms with folding partitions.

Availability
General Electric's DS-5000 fluorescent dimming system is included in the product lines of many leading fixture manufacturers. (Names upon request.)

For those who wish to convert existing lighting installations to dimming, components are available from General Electric Ballast Service Centers.

For further information and application assistance, contact your General Electric Components Sales Engineer. Or write today for our free dimming bulletins.
I'm in the roof deck business. We tell architects and contractors they don't need any reinforcement with our deck.

"After all," we say, "Decks are only required to be designed for uniform static loads. Why worry about impact loads?"

And when workmen dropped materials on the deck after the roofing material was on, well...nobody got wise that the material beneath was shattered. After all, the roofing material covered it up.

But things got a little sticky when a building inspector jumped from a low parapet onto one of our unreinforced decks. His replacement was very unreasonable about okaying the deck.

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"Besides," we say, "our decks do have some impact resistance. If a 75 lb. man falls 6 inches onto our deck he won't bother it a bit. If he doesn't do it too often."

Well, we sold a few of our roof decks at first. But after they were up, it seemed when wheelbarrows loaded with heavy materials turned off the runs, spider cracks showed up in our unreinforced
dec.

If you're not interested in one of our unreinforced roof decks, I have a nice line of pencils and shoelaces.

This advertisement published by the makers of KEYDECK that remarkably good roof deck reinforcement

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For more data, circle 164 on Inquiry Card

ARCHITECTURAL RECORD  April 1963  305
Jose Lois Sert, dean of the Faculty of Design, Harvard University, is on leave of absence until September. He will lecture at the Royal Institute of British Architects in London, complete work on museum buildings in St. Paul de Vence, France, and visit architectural works and schools in Egypt, Iran, India and Japan. Serving as acting dean for the spring semester is Professor Martin Meyerson. Professor Walter Bogner is acting chairman of the Department of Architecture during this semester.

The College of Architecture and Urban Planning, University of Washington, Seattle, has established two departments—a move, according to Dean Robert Dietz, to improve teaching and research opportunities. Appointed chairman of the new Department of Urban Planning is Professor Meyer Wolfe, faculty member since 1949 and in charge of the graduate program in Urban Planning for seven years. Professor Steinbrueck, on the faculty since 1946, author of two books, and designer of the Faculty Club, in partnership with Paul Kirk and Associates, declined the permanent appointment, but was appointed acting chairman of the Department of Architecture.

Syracuse University's School of Architecture is currently involved in a one-year pilot program aimed at preserving important architectural monuments. Harley J. McKee, professor of architectural history, heads a three-man project staff for the search and selection of major architectural items in Syracuse and the surrounding Onondaga County.

University officials and members of the State of New York Council on the Arts feel that since Syracuse is undergoing considerable urban renewal, the project is of particular importance to the area. "We must get ahead of the builders and bullhozers," says William Hull, arts council assistant director. "This is a pilot project for the whole state. If it is successful, we want to do similar surveys on a county-by-county basis across New York."

Joseph R. Passonneau, St. Louis architect and dean of the School of Architecture, Washington University since 1957, will join the faculty of Harvard University in the academic year 1963-64 as professor of architecture, as chairman of the Department of Architecture.

Professor Passonneau, in association with the firm of Fitch and Nicholas, designed Washington University's new engineering building, and he designed the structural system for the new Art and Archaeology Building.

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ARCHITECTURAL RECORD April 1963 307
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Page 308
Plan view of two Walk-Ins, one a normal temperature and the other a low temperature, installed at Dobyns-Bennett High School, Kingsport, Tennessee.

Specifications prepared by Mr. Larry J. Poole, Architect, 214 Commerce Street, Kingsport, Tennessee.

Bally pre-lab walk-ins
all-metal coolers and freezers

World’s most advanced design. New materials and construction techniques offer architects an opportunity to provide tremendous refrigeration advantages to their clients.

Urethane 4” thick (foamed-in-place) has insulating value equal to 8½” fibreglass. Standard models can be used as freezers with temperatures as low as minus 40°F. Urethane has 97% closed cells, cannot absorb moisture...ideal for outdoor use.

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See Sweet’s File, Section 25a/Ba

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The largest dandelion in the world, 10 feet in diameter and 20 feet high, rises from the middle of a lighted lagoon on the front plaza of the new headquarters building of Perpetual Savings and Loan Association, Beverly Hills, Calif. Sculptor Harry Bertoia fashioned it from stainless steel and 24-karat gold. In all, it has 84,000 parts.

Edward Durell Stone, architect for the eight-story Perpetual Savings Building, asked the Italian-born artist to create a sculpture for the fountain. The dandelion was selected from 10 different suggested designs.

A noted designer of furniture, particularly sculptured metal chairs, Mr. Bertoia counts among his other important works, the massive 4-ton bronze panel at Washington, D.C.'s Dulles Airport and a sculpture in the M.I.T. Chapel done for Eero Saarinen.

An unusual new fountain, shaped like an exotic tree, adorns the Garden of the Provinces in Ottawa, Canada.

Designed by architect Norman Slater for the Canadian capital's National Capital Commission, the 25-foot-high stainless steel fountain has a central trunk from which 100 curved branches project, each bearing a curved rectangular leaf. Jets of water spray from most of these branches and splash downward from leaf to leaf.

Structural engineer was Felix Kraus; Canadair Ltd., fabricator.

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For more data, circle 155 on Inquiry Card

ARCHITECTURAL RECORD  April 1963  311
Low-riser, wide-tread stairways make going from one level to another easier at the Peninsula Volunteers’ Retirement Apartments. Together with the overhanging roof, they also demonstrate some of wood's self-supporting capabilities.
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Wood makes retiring comfortable in a multiple dwelling . . . just by being all around in siding, stairways, and on balconies overhead. Its freedom of design permits economies in both individual interiors and large, friendly exteriors. Wood's inherent durability provides years of use with little wear . . . its compatibility with other materials promises decades of beauty.

Wood insulates, too, through hot and cold seasons. Its sound qualities help maintain privacy from one apartment or room to the next. Its multitude of grains, tones, and textures offer a welcome warmth, generate an environment enviably livable. For more information on designing with wood, write:

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Wood Information Center, 1619 Massachusetts Ave., N.W., Washington 6, D.C.
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For more data, circle 157 on Inquiry Card
The Committee of Stainless Steel Producers in cooperation with the National Institute for Architectural Education is sponsoring a competition for the design of a public transportation shelter. Eligible to enter the national competition are intermediate and advanced design students and draftsmen under 30 years of age.

A jury of architects assembled by Caleb Hornbostel, A.I.A., chairman of N.I.A.E.'s committee on architecture and scholarships, will award prizes of $800, $300 and $200 for the three best solutions to the design problem before May 15. A $500 prize will be sent to the school of the first prize winner for the purpose of furthering architectural education.

The program is available from N.I.A.E. for a registration fee of $2.50. For further information, write N.I.A.E. Headquarters, 115 East 40th St., New York 16, N.Y.

The 25th in the annual series of Student Competitions in Interior Design and Decoration sponsored by the American Institute of Interior Designers is open to students in colleges and schools in the U.S. and Canada offering degrees in this subject, except for first-year students. Scholarship fund awards are $250, $200, $150, and five honorary mentions of $50.

Subject of this year's program is a "Cruising Houseboat," the problem being interior design for two adults and three children. Area is to include a salon, galley, dining area, sleeping space, storage space and sanitary facilities.

Jury of Award is composed of Inez Croom, F.A.I.D., chairman; Mrs. Frances Taylor Heard, home furnishings editor, House Beautiful; yachtswoman Mrs. James M. Mertz; H. Clifford Burroughes, F.A.I.D., marine designer; Richard Manning, editor, publisher, Popular Boating; Critchell Rimington, editor, publisher, Yachting; and sportsman George M. Moffett Jr.

For entry forms, write A.I.D. Headquarters, 673 Fifth Ave., New York 22, N.Y. Entries must reach headquarters not later than April 26 for judging on May 14, 1963.

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The structure illustrated here shows how this concept meets the changing needs of a school in a growing suburban area. It is readily adaptable to increased pupil population or new educational philosophies.

The economy of the repeating H/P's was well demonstrated in the bids and actual construction.

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For complete data, write:

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says E. Wolman of the Jerry Wolman Construction Company, Silver Spring, Maryland.

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USS National Hollow Structural Tubing is available in squares up to 40" perimeters; rectangular tubing is available up to 32" in perimeter. Wall thickness to ½ inch. All tubing is available in random lengths, 36' to 42', and in cut lengths. For more information, see your National Tube Distributor, or write National Tube Division, 525 William Penn Place, Pittsburgh 30, Pennsylvania. USS and National are registered trademarks.

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On the Calendar

April
23-25 Building Research Institute Spring Conferences—Shoreham Hotel, Washington, D.C.
23-25 44th annual meeting and exposition, American Welding Society—Sheraton Hotel and Trade and Convention Center, Philadelphia

May
6-9 95th annual convention, American Institute of Architects; theme, “The Quest for Quality in Architecture”—Americana Hotel, Miami Beach
8-10 National convention, Consulting Engineers Council—Cherry Hill Inn, Cherry Hill, N.J.
26 32nd annual conference, American Institute of Decorators—Barclay Hotel, Philadelphia
29ff 14th Congress of the International Real Estate Federation; through June 2—Chicago

June
3-14 Institute of Church Design (lectures, seminar courses, workshops), sponsored by Carnegie Institute of Technology, Department of Architecture, and the Pittsburgh Theological Seminary—Pittsburgh 9-19 Eighth annual A.I.A.-Association of Collegiate Schools of Architecture Teachers Seminar—Cranbrook Academy of Art, Bloomfield Hills, Mich.

Office Notes

Offices Opened—Gertrude Lempp Kerbis, A.I.A., Architect Planner, has opened an office at 155 East Ontario St., Chicago 11, Ill.

Ted Granzow, formerly with Skidmore, Owings & Merrill, Architects, New York, announces the opening of offices under the firm name of T. Granzow Architect at 1857 Northwest Blvd., Columbus, Ohio.

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ARCHITECTURAL RECORD  April 1963  323
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Only Silent Gliss promises smooth, silent operation without annoying "echo chamber" roller noise. Solid nylon carriers glide freely, yet super-quietly, in precisely fitted channel.

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Only Silent Gliss track is so compact, so rigid, amazingly torsion-free. And only Silent Gliss uses all-nylon cord, traveling in patented, separated channels; no untangling ever . . . almost never any need for cord replacement!

INCOMPARABLE STYLING
Only Silent Gliss is so slim and trim . . . so unmistakably thoroughbred in styling. Whatever the job, you'll find Silent Gliss the smallest, most inconspicuous, best track you can use.

COMPLETE RANGE OF TRACKS
14 track styles to choose from: cord or hand operated; recessed, surface or bracket mounted; cubicle, extra-duty, specialty tracks too. Some tracks easily curved for specific requirements. A complete range, to meet every installation need.

Find out for yourself why Silent Gliss is the prestige track that makes sense . . . why you can buy less expensive tracks, but never make a better track investment. Write for complete details today . . .

Designed in Switzerland; manufactured in U.S.A. exclusively by

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Distributing Companies:
Angervine Co., Crystal Lake, Illinois
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THREE OF THE Newell COMPANIES

Manufacturers of Quality Drapery Hardware Since 1903
Whittier School, Cincinnati, Ohio. Architect & Engineer: James E. Allan, Cincinnati, Ohio. Contractor:

**DESIGNED WITH LUPTON CURTAIN WALLS,**

**THIS SCHOOL WAS COMPLETED FOR JUST $15.65 PER SQUARE FT.**

The 64,589 sq. ft. Whittier School, Cincinnati, Ohio, is an interesting example of how intelligent planning and good design can keep the modern school well within a practical budget and still provide complete comfort—including abundant sunlight and fresh air.

LUPTON aluminum curtain walls helped keep the cost of the Whittier School at a reasonable level... helped, also, to combine eye appeal with functional economy. And they expose, rather than hide, attractive structural features of the building. Like hundreds of schools designed with curtain walls, springing up across the country, Whittier provides a pleasant atmosphere, ideal for students and faculty.

When you plan a new school, consult with qualified building materials manufacturers. They know the practical applications of their products. The LUPTON man,
for example, can show you the possibilities of curtain wall construction and explain how LUPTON's one-source responsibility ... from architect's design to finished installation ... can cut costs, save time, help meet deadlines and assure final satisfaction.

For complete details, talk to your local LUPTON man or call any of the offices listed below.

**Main Office and Plant:** 700 E. Godfrey Avenue, Philadelphia 24, Pa.

**West Coast Office and Plant:** City of Industry (Los Angeles County), California.

**Sales Offices:** San Leandro, California; Oak Brook (Chicago), Illinois; New York, New York; Cleveland, Ohio; Dallas, Texas. Representatives in other principal cities.

**LUPTON® MICHAEL FLYNN MANUFACTURING COMPANY**

For more data, circle 172 on Inquiry Card
Office Notes
continued from page 322

Arthur R. Cogswell Jr. has opened an office for the practice of architecture at 105 North Columbia St., Chapel Hill, N.C.

Osborn Engineering Company, a Cleveland consulting engineer firm, has opened a new office in downtown Pittsburgh, Pa.

Mort R. Patton, Architect, has opened an office at 202 North Lawrence St., Montgomery, Ala.

John H. Alschuler, A.I.A., formerly a member of the staff of Friedman, Alschuler & Sincere, has opened his own architectural office specializing in service for business and industry. The address is 190 East Grand Ave., Chicago.

New Firms, Firm Changes —

Clifford R. Hayes and Thomas C. Large have been admitted as partners in the firm of Hunter, Campbell & Rea, Architects, Altoona and Johnstown, Pa.

A new professional firm, Pacific Architects Collaborative, has been organized with offices at 25 South Euclid Ave., Pasadena, Calif. The new group, which comprises eight principals and their associated firms, is to provide a pool of architectural and design services in the commercial, industrial, institutional, civic and housing fields. President is Keith P. Marston; vice president, Edward D. Davies. Board includes David Chow, George S. Conner, Robert L. Deines, R. Van Buren Livingston, Theodore L. Pletsch and William Henry Taylor.

Otto A. Koch has been appointed chief electrical engineer with Valley Engineering Company, consulting engineers, Glenside Ave., Glenside, Pa.

Robert T. Handren, A.I.A., has formed a partnership with J. Stanley Sharp, A.I.A., as Sharp and Handren, Architects, New York.

William J. Zalewski has been appointed project architect of H. A. Kuljian & Company, Philadelphia architects and engineers.

Robert E. Earnheart, A.I.A., formerly in private practice in Kansas City, Kans., has joined the firm of Powers and Associates, Planners-Engineers-Architects, Iowa City, Iowa, as a partner in charge of the architectural department.

continued on page 338

LATCH-BOLT FORM
INCREASES SPEED ON LIGHT OR HEAVY CONSTRUCTION

Symons new latch-bolt hardware is now available for use on all Symons Steel-Ply Forms. This new system can be used for residential, commercial and heavy construction. Forms can be converted to ganging simply by removing a threaded slide bolt and substituting gang form bolt.

Other new innovations are Symons new Hi-Strength 6,000 lb. flat tie. Hi-Strength is designed to set 3 ft. on center saving up to 33% of ties and labor normally required. Only 2 ties (instead of 3) are needed for a 6 ft. panel; 3 ties (instead of 4) for an 8 ft. panel. Also wailing for single lift forming can be eliminated by using Symons new steel cap-water brace. It fits rigidly over the top of Symons Steel-Ply Forms. No hardware is required. The cap can be used as a brace because it interlocks with standard form hardware.

Symons Steel-Ply Forms with new attached latch-bolt can be rented with purchase option.

For more data, circle 173 on Inquiry Card

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Symons Steel-Ply Forms with new attached latch-bolt can be rented with purchase option.

How to be sure you get VICRTTEX when you specify VICRTTEX Vinyl Wallcoverings

Occasionally, an architect wanting VICRTTEX quality discovers that through misinterpretation of specifications a different, less desirable wall covering has been installed. With tighter specs this might never have happened. The wall covering installed would have been VICRTTEX with its full beauty of color, distinctive textures and patterns; permanent wall protection; low, low, maintenance; and tested and proven fire safety. To be sure you get VICRTTEX quality when you specify vinyl wall coverings:

1. Specify by weight and thread count a bleached, pre-shrunk, mildew-inhibited cotton fabric backing sufficient to give a blemish free, dimensionally stable, easily applied wall covering.
2. Specify by weight, adhesion to backing and abrasion resistance a vinyl coating composed of top grade ingredients and electronically fused to the fabric.
3. Specify a low fire hazard classification continually maintained and certified by an independent laboratory and deliver the wall fabric to the job site in containers bearing the classification label of that laboratory.
4. Require subcontrac tor to submit with his bid the manufacturer’s name and product quality on which his bid is based.

Write for our booklet “A Practical Guide to Specification, Selection and Use of Vinyl Wallcoverings.” Do it today!

L. E. CARPENTER & COMPANY
Empire State Building, New York 1
(212) Longacre 4-0800

For more data, circle 174 on Inquiry Card
Rotacore, a unique, eye appealing Supply Grille with close spacing of the horizontal bars which give a uniform straight line appearance and cuts "see through" to a minimum.

Rotacore is sturdy with a removable core that is pencil proof, ideal for schools and other installations where small objects must be turned aside.

Rotacore of stylish lightweight extruded aluminum has core with snap-out, snap-in attachment feature for quick choice of...

**4 POSITIVE DEFLECTIONS**

With second set of vertical individually adjustable louvers for spread deflection. Ask your Representative for complete details on Rotacore, and our complete line of Grilles, Registers, and Diffusers or write Waterloo Register Company, Inc., P.O. Box 147, Waterloo, Iowa
Pittsburgh Corning products
offer unique solutions
to some of building's most critical problems

Take the problem of the room
where hearing is important
—and you want to hear well
Slope the ceilings, zig-zag the walls, cant the floor,
slot the masonry, slat the woodwork, patch with pegboard. All this takes time and money. When these
are limited, usually they are, you can still do the
right acoustical job without structural extravagance.

Pittsburgh Corning
has a unique solution:
GEOCOUSTIC®
GEOCOUSTIC units can be applied directly to
the finished room surfaces without additional prep-
aration—harmoniously, selectively and in exactly the
right places acoustically. And GEOCOUSTIC treat-
ments require little time, little money.
lets you design room acoustics in accordance with professional recommendations

Now you can design your room acoustics according to the textbook, in classrooms, auditoriums, bandrooms, gymnasiums, pools, cafeterias, lecture halls, studios, churches, restaurants, theatres—anyplace where it’s important to hear and be heard in a room.

Mail the coupon for complete details.
Colgate Palmolive Company's new multi-million dollar research center presented architects Eggers and Higgins with a formidable array of "musts." The building had to be expandable. All 170 laboratory modules had to have daylighting and forced ventilation. The building had to accommodate offices, cafeteria, conference rooms and a 17,000-volume library. Solution: a finger plan. Two lab wings and three wings for administrative, conference and library space project from a central axis corridor that curves gently to fit site contours and to avoid a tunnellook inside. Mechanical ventilation equipment is in the clearstory. Every lab module has a big plate glass window. The exterior is practically maintenance-free: ceramic, glass, and enamelled aluminum.

"The Dodge Reporter helped us by alerting local contractors and suppliers to our needs," says Partner, David Eggers. "On one of his regular visits we informed him of the project, and during subsequent visits we filled him in on details. This way, suppliers and trades who called on us were already educated to our requirements."
For quality toilet compartments
shower stalls / dressing enclosures
in baked enamel / porcelain enamel

Specify...

GLOBAL

See SWEETS 22b/GL —
Write for large sized detail
and specification sheets.

REPRESENTATIVES: Some choice territories
are still open. Representatives in most
states of United States including Hawaii.

GLOBAL STEEL PRODUCTS CORPORATION
80-A SMITH STREET • FARMINGDALE, NEW YORK

Textured Textolite—the remarkable no-glare laminated plastic finish for office use—offers unlimited application versatility in a practical, maintenance-free surfacing. Available through most leading office equipment manufacturers. Write for samples.

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, Coshocton, Ohio  Dept. AR-43
( ) Send samples of G-E Textolite® laminated plastic.

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Firm
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City Zone State

For more data, circle 183 on Inquiry Card

ARCHITECTURAL RECORD April 1963 335
These two central systems can provide

Carrier Classroom Weathermaster System
...for use where outside walls and windows must be swept with warm air in winter


This compact, two-story structure serving 600 pupils occupies half the space required by an equivalent finger-type design. Site acquisition costs were reduced by $200,000. Year-round climate control, which made the compact design possible, is provided by the Carrier Classroom Weathermaster® System. The building contains 22 classrooms, four special purpose rooms, and offices. Cost per square foot with full climate control: $14.92, about average for elementary schools with heating-ventilating only in the Syracuse area.

The single duct induction system using Carrier Classroom Weathermasters gives individual room control without complex zoning. One air treatment station centralizes outside air intake, filtration, cooling, condensate disposal, air movement. Carrier supplies refrigeration, too.

BOTH SYSTEMS OFFER THESE ADVANTAGES

1. Individual classroom temperature control with maintenance-free simplicity.
2. Complete positive air changes up to 10 times an hour in every classroom to eliminate overheating, odors and stuffiness.
3. Assure uniform sound level of proper quality and intensity to mask noise.
4. Centralized, economical maintenance with no moving parts in the classrooms.
5. 100% outside air for free cooling in the intermediate seasons.
6. Superior air filtration with optional air washing—no filters to change in the classrooms.
economical climate control for any school

Carrier Multi-Zone Weathermaker System
...for use in interior spaces and compact schools where downdrafts don't form


This 2200-pupil school in hot, dusty West Texas is fully air conditioned, yet cost only $12.10 per square foot. Closely related structures are grouped around a central court. Classroom and laboratory sections are compacted into separate squares, affording flexible partitioning of interior space for classrooms, laboratories, teachers' offices and storage centers. From several small mechanical rooms containing Carrier Multi-Zone Weathermakers®, ducts radiate to each classroom, giving individual room temperature control.

Centrally conditioned air is ducted to ceiling diffusers. High window strips give a feeling of spaciousness and eliminate distractions. Refrigeration is provided by two Carrier Automatic Absorption Machines powered by low-pressure steam which also supplies heating.

CARRIER OFFERS EVERY MAJOR COMPONENT

From the complete line of major Carrier components, the engineer can select the optimum combinations for initial and operating economy and best performance. Carrier also has service to back up the installation. Our company and our dealers maintain the largest and best-trained service organization in the business—over 11,000 men strong. For specific information about Carrier systems—and about our complete line of components—call your Carrier representative. Carrier Air Conditioning Company, Syracuse 1, New York. In Canada: Carrier Air Conditioning Ltd., Toronto 14.

For more data, circle 185 on Inquiry Card
Office Notes
continued from page 330

Frederick F. Sadri, A.I.A., is now senior associate in charge of architectural design in the firm of J. N. Pease Associates, Charlotte, N.C.

Hugh Shepley and Jean Paul Carlhian have been admitted to partnership in the Boston firm of Shepley Bulfinch Richardson & Abbott.

Douglas William Orr, F.A.I.A., announces that Edwin William de Cosy and Frank Dodd Winder have become his partners, and the firm continues under the name of Office of Douglas Orr, de Cosy, Winder and Associates, Architects, Offices are at 111 Whitney Ave., New Haven, Conn.


Francis F. Widrig has been promoted to an associate in the structural consulting firm of Clifford Holforty Associates, Birmingham, Mich.

The partnership of Celli-Flynn, Architects-Engineers-Planners, McKeever, Pa., has expanded to include as associates Sylvester Damianos, R.A., and John T. Fowen, R.A.

New Addresses


Hellmuth, Obata & Kassabaum, Inc., Architects, Blue Cross Building, 1430 Olive St., St. Louis 3, Mo.

Ralph Kelman, 11111 North Central Expressway, Dallas 31.

Guy B. Panero Inc., Consulting Engineers, 468 Park Avenue South, New York 16


Street and Street, Architects, 920 - 1808 West End Building, Nashville 3, Tenn.

Addendum

The credit for the residence of Robert A. Anderson Jr., February, pages 151-154, should have included Mr. Anderson's firm name, Wilson, Morris, Crain & Anderson.

More than 2,000 children die each year of leukemia—cancer of the blood-forming tissues.

Important findings in research laboratories helped extend this child's life—and the lives of other little victims—by many precious months. Research scientists now see evidence that a virus may cause leukemia and this might bring closer the development of a vaccine to prevent the disease.

Research will save children in the future. But research is expensive. Give some money. Please. It's for them.

AMERICAN CANCER SOCIETY
When installed to template, door portion of holder can be raised as much as ¼" to adjust in the event of door sag. Can be lowered as much as ⅛".

ADJUSTMENT IS SIMPLE
1. Loosen four screws on door portion.
2. Raise or lower in ⅛" increments.
3. Tighten screws.

*AS IN ADJUSTABLE

For more data, circle 187 on Inquiry Card

ARCHITECTURAL RECORD April 1963 339
Going Up—VA-POWER 150 hp Boiler on its way up the core—
to be installed on the 32nd floor of Astor Tower, Chicago.
Architect: Bertrand Goldberg
Va-Power SpecEngineering
Conquers Space

In today's world of population concentrations and high industrial property costs, maximum utilization of space is an economic necessity. VA-POWER SpecEngineering conquers space by allowing you to put boilers where old-style, bulky boilers simply couldn't fit.

VA-POWER Boilers need no expensive enclosure, foundation or stack—any aisle or unused corner, anywhere—basement, balcony, even on the roof is all the space you need. You can get an astounding 150 bhp in only 5' x 8' floor space. Equally easy to move—go right through plant-type doorways.

Shipped fully assembled—just connect and fire up. Can’t waste fuel or water because steam is made only "on demand" to maintain the pressure you want. Goes from a cold start to operating temperature and pressure in as little as 2 minutes!

As your main steam source or as an auxiliary source for power, processing, heating or for emergency use... specify VA-POWER and get the space-saving you need from SpecEngineering.

Lightweight enough to be installed on a catwalk
Compact enough to be installed on a mobile trailer
Small enough for seven boilers (total 835 HP) to fit on one truck

Send free copy of VA-POWER SpecEngineering Application Chart containing complete information on the entire VA-POWER line of Boilers.

INDUSTRIAL DIVISION
VAPOR CORPORATION
Dept. No. 41-D
6400 West Howard Street
Chicago, Illinois

For more data, circle 188 on Inquiry Card
"Regardless of the strengths and attributes our nation possesses, if we fall behind in the field of education, we will fall behind as a world power.

“Our scientific, cultural and economic growth—and our political strength—will depend largely upon the educational facilities we make available to our youth. We owe it to ourselves as a nation; we owe it to our young people who will inherit this nation to provide the financial aid that will make our institutions of higher learning second to none in the world. This is of vital importance to our business community.

“Business must put its support on the line to help win the battle for higher education.”

Today many of our colleges are overcrowded. In ten years, applications will have doubled and we will be faced with an even more serious crisis in our institutions of higher learning. We will need more and better college classrooms, many more well-equipped college laboratories and thousands more of the most dedicated and well-trained professors.

Only increased financial aid will provide our young people with the best college facilities. Only increased financial aid will keep our finest minds from leaving the teaching profession.

For additional information on the crisis faced by higher education write to: Higher Education, Box 36, Times Square Station, New York 36, N. Y.
Few jobs come too tough for this Splen-door. Even gymnasium punishment isn’t too severe for those panels of anodized aluminum and hinges of rugged vinyl. Best of all, the Splen-door 66 you see here can save you about 40 per cent of what you’d have to pay for some conventional gym partitions. Even the stack space is a saving . . . at one inch per foot of opening width. Get the full details now, outlined in a colorful eight-page book. Just fill out the coupon at the right.
“Electroninc” sensing elements mount in any high aspirating air diffuser system ...respond up to 15 times faster than wall-mounted thermostats.

NEW from BARBER-COLMAN

A thermostat for

“Dynamic Sensing”—developed by Barber-Colman—puts the thermostat where it belongs...in a moving stream of air.

It’s moving day for thermostats! “Dynamic Sensing” removes thermostats from the large wall mass that prevents rapid response to temperature changes. Barber-Colman “Electroninc” sensing elements mount in ceiling diffusers, air/light diffusers, and all types of perimeter units that surround the thermostat with a stream of constantly moving room air. Room temperature is continuously sampled. Changes are detected instantly. Overheating or overcooling are eliminated assuring accurate, uniform, and economical temperature control.

Problems of proper thermostat placement are solved. The pencil-slim stainless steel tube which houses the sensing element is completely hidden in most applications...out of sight, out of mind. Adjustments are made electronically from a remote point safe from tampering and accidental damage.
air on the move!

Installation is simplified. Economical, low-voltage wires connect thermostats and controls. Drilling or channeling of runs for electrical conduit or pneumatic tubing is not necessary. Controls can be installed right along with heating and cooling equipment; no more waiting for walls or panels to be erected before comfort apparatus can be used.

Off-the-wall mounting brings new flexibility to room partitioning. Walls and panel dividers can be moved at any time without altering the temperature control system.

These advantages of “Dynamic Sensing” provide the imaginative architect and engineer new freedom in temperature control system design. For a copy of the latest progress report on “Dynamic Sensing” call the Barber-Colman Automatic Controls field office nearest you.

Barber-Colman Company
Rockford, Illinois

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Toronto, Ontario

...where originality works for you

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6TH EDITION

YOUR KIT OF TOOLS
for quick, sound estimates of:
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In constant use by appraisers, banks, real estate offices, institutions and others, since 1929. Answers EVERY technical question about building costs, valuation approach, clearly, simply, specifically. NOT a textbook, but a practical, in-the-field tool for the working appraiser or estimator. You need no formal experience! Boeckh's simple "4-Step System" does it all for you.

"BUILDING COSTS" is a monthly supplement to the manual... gives you up-to-date, accurate adjustments to fit your location's current costs... anywhere in United States or Canada... any time, month by month!

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[ ] Yes. I want the 6th EDITION of Boeckh's Manual of Appraisals and a 12-month subscription to the "Building Costs" supplement. Am enclosing $40.00 in full payment. I understand I may return this material for any reason, within 10 days for FULL refund.

[ ] Send me descriptive brochure at once.
In Jacksonville’s new Civic Auditorium, comfortably-seated audiences salute the architects for specifying the outstanding performer in the field of auditorium seating—the all-steel ENCORE TC-700 Chair by Heywood-Wakefield.

Built to provide maximum comfort for years, the 3,809 ENCORE Chairs offer generously padded backs, coil spring cushions, and self-rising seats. Comfort is further assured by generous back-to-back spacing and a seat-to-back ratio determined by scientific study.

Complete information on the ENCORE TC-700 Chair and other Heywood-Wakefield quality seating is in section 361 of Sweet’s Catalog; or write us now for a complete seating portfolio.
Slammed, banged, twisted and tortured
...over 1,000,000 times without breaking down!

Rugged Slam Test plus Dual-Moment Test by Independent Labs Prove Kawneer 190 Superior

Using the full spring force of a closer with no hydraulic checking action, a Kawneer 190 door was slammed against a racking block more than a million times! This severest test of a door's strength was conducted by an independent testing laboratory.

Their report states that after testing, there were no cracks, corner damage, loose bolts, broken welds or twisted rails. There was no damage, nor sign of wear to hinges and fastenings. Clearances at head, jamb and sill remained constant. Diagonal dimensions were unchanged—proof the 190 didn’t sag. The lock-in glass stops were still tight.

Results of Dual-Moment Testing on Doors by Major Manufacturers. Another Independent Laboratory subjected the Kawneer 190 and eight well-known competitive doors to the tortuous dual-moment lever arm and torque test ... applying forces of common door failure. The corner of the 190 door held fast against a load of 200 pounds. The average performance of other doors tested was failure at 98.7 pounds load.

<table>
<thead>
<tr>
<th>Dual-Moment Test—Lbs. Applied Before Failure</th>
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<tbody>
<tr>
<td>Kawneer 190  ... 205 lbs.</td>
</tr>
<tr>
<td>Brand 1  .......... 55 lbs.</td>
</tr>
</tbody>
</table>

Affidavits of Independent Test Reports are available when request is submitted on your letterhead.

The Kawneer 190 door is better, competitively priced and installs faster. And now it is available in *Kalcolor®* (black, gold, amber) as well as with Alumilite 204 A1 R1 finish.

Rack-proof ... The strongest corner construction ever! Kawneer doors are welded four times at each corner with a secured reinforcement.

Dual-Moment Lever Arm and Torque Test ... Simulates the most common, failure-causing loads submitted on door corners.

*Licensed trade-mark of Kaiser Aluminum and Chemical Corp.

Kawneer Company, A Division of American Metal Climax, Inc.
Niles, Michigan • Richmond, California • Atlanta, Georgia • Kawneer Company Canada Ltd., Toronto, Ontario, Canada

For more data, circle 192 on Inquiry Card
A brief run-down on the newest, most versatile wall partition

A portable, self-storing wall, able to be set up or taken down in minutes, KWIK-WALL is a totally new concept in portable partitions. Installed with or without ceiling channel . . . KWIK-WALL panels have the appearance and properties of a permanent wall with complete flexibility of movement.

**DIMENSIONS:** KWIK-WALL partitions are 48" wide with special width sections available to fill space that does not work out to an even 48". Heights up to 12' are available, final wall dimensions to be 1 1/4" less than opening size.

**OPERATION:** Partitions shall be sealed by means of a crank operating a mechanical device built into each panel. This device expands the trim cap of all sections and the side member of one end section, providing up to 50 lbs. of pressure to hold sections secure. Both the top cap and side cap have a maximum expansion of 2 1/4".

**CONSTRUCTION:** Available in two thicknesses, 1 1/4" and 2 1/4". Panels shall be flush with an aluminum frame and two layers of small cell paper honeycomb core with thin sheet of lead between layers. Aluminum frame of tongue-and-groove extrusion with an implanted rubber seal to provide tight fit and sound retarding qualities of a frame wall. The expandable trim cap on all panels and the expandable side member on the end panel are of aluminum with rubber seal implanted to provide even pressure and seal the entire opening, even if the latter is out of square and out of level. Pass doors are available in either right or left hand openings, made to swing either in or out, as ordered. Sizes 2'8" or 3' x 6'8".

**FINISHES:** KWIK-WALL partitions are available in a wide variety of surfaces, including prefinished natural wood, print grain plywood, hard-surfaced plastic, decorator vinyls, and unfinished plywood suitable for painting or finishing. Custom made in 48" widths, heights up to 12'.

Write Department AR4 for brochure and complete information.

---

This Instalite mounting ring revolutionized recessed incandescent lighting!

Here's why:

Century's new line of Instalite fixtures enables you to install interchangeably a fresnelens unit, an accentlite, a wall washer, a reflector downlite, or a conelite in the same mounting ring and through the same size ceiling aperture. Installation is fast and easy. The fixture body or reflector snaps into place with the twist of a screwdriver. Instalite fixtures are engineered for precise optical performance. Die cast fixture trim gives ceilings a clean, open appearance. Write for brochure.
WHY CUT
SPECIFIED
OFF AT THE KNEES BY ADDING
"or equal"

Plant engineers have practical experience with the many products used in their plants. They have installed them; maintained them; cursed them; and blessed them. When ordering products for a new plant or plant expansion, they know exactly what they want.

Specifications coming out of plant engineering departments are always well written and very complete. A typical "spec" will provide all of the pertinent data on the coating. This will include the catalog number and name of the manufacturer. If they would stop at this point, life would be a lot easier for a lot of people. However, just to make sure everyone will be happy, some plant engineers add "or equal" to the specification.

Those two apparently peaceful words guarantee trouble. Many contractors interpret "or equal" to really mean "or cheaper" and submit their bids based on the use of inferior products. Even reputable contractors are forced to consider cheaper materials to stay in the bidding. Distributors and manufacturers are also caught in this squeeze with insistent demands for cheaper materials that only look something like the item specified.

Adding "or equal" is a fine and noble gesture. It proves you have good intentions and an open mind. However, in practice it leads to emphasis on cheaper materials and low priced jobs. It is high time we took a hard look at "or equal" and cut it out of American engineering language.

When you write your next specification, instead of "or equal" try "NO SUBSTITUTIONS." Your bids will be more realistic and you will have less trouble now and in the future. When you specify a product based on past experience, stick to it. After all, you will have to live with it for a long time.

Does a firm specification restrict competition? It sure does. It protects the manufacturer building a quality product. Without this protection, sales will be lost unless he is willing to lower the quality of his product. Should you restrict competition? You bet your life you should. You can force the supplier of inferior products to make improvements to meet your needs. This is certainly more constructive than forcing quality products to lower standards.

If you want long life, reliable operation, and lowest over-all cost . . . find the best product, specify it, and allow "NO SUBSTITUTIONS."

---Adapted in part from PLANT ENGINEERING, DECEMBER, 1962---

Gentlemen: At no cost or obligation, please send me the following:

- 24-Page "Long Life Facts" Brochure.
- 38-Page New Color Horizons Catalog.
- Specification Charts for Coating Structural Steel and Steel Components.
- 40-Page "101 Rust-Stopping Tips" Booklet.

For more data, circle 194 on Inquiry Card

--- ATTACH TO YOUR LETTERHEAD ---

P.S. Rust-Oleum emphatically endorses the above editorial and its philosophy. We know that there is no substitute for Rust-Oleum. We take pride in being the industry leader in rust preventive coatings with over 40 years of industry proof! Why "or equal" when there is only one Rust-Oleum?

There is only one Rust-Oleum. Distinctive as your own fingerprint.
From Carpenter Center...

Honeywell’s at Harvard...controlling temperature

Just two men at two Honeywell Selectographic Control Centers supervise the whole job in Cambridge! One man at each centralized control panel can check and change temperature... start, stop and monitor fans, heating and air conditioning equipment. He can even operate steam valves and monitor flood valves... all from a console about the size of an ordinary desk.

Three years ago, an analysis showed “an inordinate amount of time” needed for operating men to go from building to building to perform routine functions. Harvard was ready for automated control.

The Harvard campus poses some interesting problems for an automated control system. For one thing, it’s big... both in area and in number of buildings. For another, the buildings themselves differ greatly in age, size, design and requirements. Finally, Harvard is growing fast. They had to have a system that could handle the expansion they plan in the years ahead. Working with Honeywell engineers, they decided the best solution was two centrally-located Honeywell Selectographic Data Centers.

As the map shows, one center controls 67 campus buildings north of the Harvard Yard. Another, in Holyoke Center, will control 40 buildings south of the Yard. As an indication of the capability of these systems, one man at the north Data Center can:

1. view 37 schematic diagrams (projected from slides) representing systems for the 67 buildings.
2. start, stop, or listen to 42 fans up to \(\frac{1}{2}\) mile away.
3. operate 32 steam valves.
4. check temperatures at 100 points.
5. get immediate warning of humidity changes in steam tunnels or library.
To Divinity Hall

and equipment in 107 buildings, all sizes, all ages

areas (which include, among other treasures, priceless Oriental manuscripts). Reports indicate that savings from this automatic control program will amortize the investment in two years, besides improving service. And, Harvard has a modern control system that can accommodate new facilities as they’re built.

Automated control is an important part of any modern building program... any expansion plan. The booklets offered at right are designed to help you in the planning stages of your newest project. And, whether it involves new or old buildings, one building or hundreds, Honeywell has the systems and the know-how to survey, plan, install and service any job efficiently and economically. 112 offices in the U.S., others in all principal cities of the world.

Mail coupon for project analysis, planning guides.
Honeywell, Dept. AR4-82,
Minneapolis 8, Minn.

Send me the following free planning guides:
☐ Security and Surveillance
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When one top advertising

Bell Telephone Laboratory, Holmdel, N.J.
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you've located the leader...

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In cavity wall buildings, unsightly efflorescence and interior wall damage can result from accumulated water in the cavity. Causes: water penetrates joints in the outer wall; condensation forms on the inner wall.

Wasco® flashing... properly installed in conjunction with weep holes... can prevent these conditions permanently. Water then is directed to the outside of the building before it can accumulate.

Wasco brand flashing, the nation's leading line, provides this permanent protection in every type of building for generally less than 1/20 of 1% of your total construction cost. On a $1 million building, that's just $500.

Wasco flashing offers you the only complete line of thru-wall and spandrel flashing... for protection from parapet to foundation. Select from 16 different types of Wasco flashings, including copper-fabric, copper-asphalt, copper-lead, fabric, plastic, and aluminum.

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TO KEEP WATER OUT... BUILD WASCO FLASHING IN... COMPLETELY.
AVAILABLE OVERNIGHT TO ANY JOB SITE... ANYWHERE IN THE COUNTRY.

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FROM ARMSTRONG . . .
AN ENTIRELY NEW KIND OF FLOOR:
VISTELLE CORLON TILE—
WITH DU PONT HYPALON

This handsome new floor is probably the most significant development in resilient floors since the introduction of vinyl. It offers the best combination of physical properties and functional advantages ever incorporated into one flooring material.

Here's how Vistelle compares to some other widely used commercial floors:

**RESISTANCE TO INDENTATION MARKS**
Some flooring materials, such as terrazzo, marble, and the better unfilled vinyl tiles, resist indentation by virtue of their hardness. But they offer this benefit at the sacrifice of underfoot comfort. Vistelle's exceptional resistance to permanent indentation is a function of its extreme resilience. It gives on impact, but recovers when pressure is released, providing a floor that is free of permanent indentation marks and at the same time, comfortable underfoot. Unlike other resilient floors, the resilience of Vistelle Corlon Tile does not decrease with age.

**RESILIENCE**

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<th>VISTELLE</th>
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<th>RUBBER</th>
<th>UNFILLED VINYL</th>
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**RESISTANCE TO CIGARETTE BURNS**
Vistelle's superior resistance to cigarette burns is shown in the chart above right. In this test, cigarettes were left to burn out on the tiles. Then the tiles were cleaned with fine steel wool and a commercial floor cleaner and the remaining stain given a severity rating from 0 to 5. Vistelle rates best with only slight staining; so slight in fact, that it was undetectable at arm's length. The vinyl tiles were irreparably scarred, the rubber tile severely stained.

**RESISTANCE TO STAINING**
Staining tests have also been conducted with more than 100 solvents, acids, and chemicals — and with a like number of common household staining agents such as lipstick, grape juice, crayon, and ink. As shown below, in both sets of tests, Vistelle received a rating of 1 or below indicating very slight or no visible stain. Vistelle is also greaseproof.

**ACID, SOLVENT, CHEMICAL STAINING**

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**COLOR CLARITY AND FADE RESISTANCE**
Compared to other resilient floors, Vistelle's white is whiter, its black deeper, its colors richer. The delineation of design is sharper, too, because colors do not overlap one another. Vistelle is also highly resistant to fading. Test floors exposed to traffic and sunlight for several years have stayed remarkably color constant.

**DURABILITY**
Vistelle gives superior service under heavy traffic. Tested on the entrance ramp at the Monsanto House of Tomorrow in Disneyland, it was exposed to a traffic rate of 6,000 people a day . . . a total of four million during the test period. After two years under these severe conditions, constantly abraded by sand and gravel tracked from paths leading to the house, only 20% of the tiles' thickness had been worn away.

**COST**
A floor of Vistelle costs $1.50 to $2.00 sq. ft. installed over concrete, depending on the size of the installation. Vistelle can be installed at any grade level over any type of subfloor.

For samples of Vistelle Corlon Tile and technical data, call the Armstrong Architect-Builder Consultant at your Armstrong District Office. Or write to Armstrong, 304 Rock Street, Lancaster, Pennsylvania.

Vistelle and Carlon are trademarks of Armstrong Cork Co. Hypalon is a registered trademark of Du Pont.
A lighted cigarette will not burn its surface.

Excellent resistance to indentation —
comfortable and quiet underfoot.

Developed expressly for heavy
commercial traffic.

Ten colorings in five color-coordinated pairs.
Subtle, flecked design gives a plain monolithic effect.

Resists more chemicals, solvents, and
staining agents than any other
resilient floor.

Dimensional stability guaranteed by Armstrong in writing.
The carriage house soars 26 stories skyward in the heart of Chicago’s lakefront Gold Coast. Here fine materials and peerless architectural detail establish a new pattern of city living. Combined under one roof are hotel rooms and both unfurnished and exquisitely furnished apartments of various sizes. There’s a charming cocktail lounge and a gourmet dining room for prestige entertaining. Resort facilities include swimming pool, cabana club, solarium, recreation room, patio garden.

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Performance records of millions of Sloan Flush Valves indicate that

When Chicago’s CARRIAGE HOUSE is 50 years old

Its Sloan Flush Valves will still provide dependable service

Moreover, Sloan Flush Valve maintenance costs are likely to be among the lowest in the building maintenance budget... (as little as 1½¢ per valve per year).

Because the Sloan ROYAL is acknowledged as the world’s most successful flush valve, attempts have been made to imitate some of its most important features. But why gamble with substitutes when you can plan for the life of the building confidently with Sloan? Specify and insist upon performance-proven, time-tested Sloan Flush Valves.

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