April 1952

Spiral museum  Frank Lloyd Wright perfects his revolutionary proposal for a modern art gallery (p. 141)

Metal curtain walls  Aluminum and stainless steel get their first big tryout in Pittsburgh (p. 135)

UN conference building  Exposed structure and mechanical equipment as decoration (below and p. 103)

Better masonry walls  By Professor Walter C. Voss of MIT (p. 162)

High school  Four one-story schools on top of each other (p. 152)

Building for atomic defense  Government research designs the shelter problem (p. 148)

Hospitals  The Skidmore, Owings & Merrill program (p. 120)
This office was planned for a fast-moving business

- This company needed a place to work — in a hurry. Because of an unforeseen emergency, it was necessary to move key personnel into a new plant office weeks before the scheduled moving day. Fortunately, Hauserman Movable Interior Partitions already had been specified — had been ordered before the emergency arose.

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architectural forum

APRIL 1952

NEWS

LETTERS

UN CONFERENCE BUILDING

Linking the UN Secretariat and Assembly Hall, the meeting halls are distinguished by their decorative use of exposed structure and mechanical facilities.

PHILADELPHIA'S REDEVELOPMENT PLAN

A big job is divided into small parts for easy handling by local redevelopers with limited resources.

HOSPITALS BY SKIDMORE, OWINGS & MERRILL

Their similarities are based on the uniform requirements of the typical patient; their variety, on widely different medical programs, site conditions and geographical locations.

STEEL OFFICE BUILDING

Built for the conservative U. S. Steel Corp. and Mellon Bank in Pittsburgh, it logically displays a conservative approach to design and a generous use of steel. Architects: Harrison & Abramovitz and W. Y. Cocken.

BUILDING REPORTER

New developments in metal curtain walls demonstrated by the Gateway and Alcoa office buildings in Pittsburgh.

SPIRAL ART GALLERY

Frank Lloyd Wright perfects his ramped design for the new Guggenheim Museum in New York City.

FERRY TERMINAL

Designed for Cape Charles, Va. sight-seers, vacationers and tourists, it is built to withstand the jolt of docking boats. Architect: Lester Tichy.

BUILDING FOR ATOMIC DEFENSE

Civil Defense Administration recommends where and how to provide shelters in old and new buildings.

HIGH SCHOOL

With all the advantages of a small school, this big one in St. Louis is actually four one-story schools on top of each other. Architects: Murphy & Mackey.

NINE TOP SCHOOLS

Winners in two design competitions show how contemporary design accommodates a wide range of educational programs.

SIX LIGHTING DESIGNS

Ranging from art gallery to shooting gallery, these are outstanding entries in the International Lighting Exposition contest.

BETTER MASONRY WALLS

Professor Walter C. Voss discusses eight ways to make them strong, weather tight and attractive.

COMMERCIAL BUILDING CREDIT

Economist Miles L. Coleman documents the case for quickly relaxing credit controls.

REVIEWS

PRODUCT NEWS

TECHNICAL PUBLICATIONS
CECO first choice

in another great building project

The J. W. Robinson Company's new Beverly Hills Department Store — built with Ceco Reinforcing Steel and Windows for truly modern design.

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American Radiator & Standard Sanitary Corporation, Dept. AF-42, P. O. Box 1226, Pittsburgh 30, Pa.
GPX helps speed Fairless Works construction

GPX plastic-faced plywood, the modern miracle material which has revolutionized concrete form use in countless applications, is now working production miracles for United States Steel Company's new $400,000,000 Fairless Works near Trenton, N. J.

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- Insurability • Fire Hazards • Material Compatibility
- Structural Stability • Building Code Conformance

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NEW FREE BOOKLET!
Roof booklet with diagrams, data, complete specifications for fill-type roof insulation and Zonolite roof decks. Send now for your copy.
The anatomy of the 525 Wm. Penn Place Building reflects a number of cost-cutting features of Q-Floor construction. Some of these advantages are obvious...some of them are intangible and do not show up as a credit on a builder’s estimate.

Take speed of construction, for instance. With Q-Floor, proper job organization can save as high as 20 to 30% in construction time. Consider what this earlier occupancy means to the owner. Modern office building rentals today are a minimum of $3.50 per square foot per month. On a large building, two months earlier occupancy (not unusual with Q-Floor construction) means $1.00 per square foot earned—about the cost of the Q-Floor. No other element in a building pays its own way like this. Although intangible, this saving is as real as a tax refund.

Latest proof of Q-Floor’s building speed is the 525 Wm. Penn Place Building...tenanted by nearly 4,000 employees, eleven months after steel construction began. Every day of time saved over old-fashioned construction methods is money in the bank for the owners...for which Q-Floor was directly responsible.

The anatomy of a healthy building reflects, also, an easy adjustment over the years to its tenant requirements. Q-Floor’s flexibility to electrical layout, desk and partition changes, keep the building alive, just as good reflexes are the sign of a healthy individual. This, too, is an intangible and is often overlooked when building costs are being discussed.

Clean-cut Q-Floor construction brings many tangible savings which reflect in lower contractor’s costs. The uncluttered, permanent working platforms all over the building give an unequalled opportunity for job organization and lower overhead. Be sure your contractor knows about this.

525 Wm. Penn Place is merely the newest example of a healthy building. All across the United States are other Q-Floor buildings that are growing old without aging.

Steel Q-Floor is shown here with suspended ceiling and a condensed visualization of mechanical equipment needed in a modern building.

Note that Q-Floor exceeds the function of a mere structural floor. It provides raceways through the cells for any type of electrical system. No preset inserts are required for suspending the ceiling or the mechanical equipment.

Q-Floor construction, with its four-hour fire rating by Underwriters’ Laboratories, Inc., weighs only about 1/2 the weight of old-fashioned, slow monolithic construction.

Write for Q-Floor Literature.

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Building forms for spandrel fireproofing, the carpenters have plenty of space for their power tools. Yet other materials, such as facing stone, can be stored close to where it will be used, thus eliminating off-site storage costs.

Convenient placement of bricks and mortar within easy reach speeds bricklayers' work. Q-Floors provide plenty of safe working space, dry, uncluttered, noncombustible. Inclement and freezing weather cause no delay.

Drafting room time is saved because no preset inserts are needed for hanging mechanical equipment and ceiling. With Q-Floor, hangers are simply dropped through the floor, or stud welded quickly to the underside, without headaches for the drafting room. Changes in layout are easily made on the spot.

Epilogue over the years

After the structural work is complete, a whole new set of electrical advantages accrue over the years. Outlets and partitions need not be located until after tenants move in. The outlets can be established in a matter of minutes. An electrician merely drills a small hole, fishes his wire, and establishes the outlet fixture. This also saves a great deal of drafting room time and tremendously reduces alteration expenses for tenants. Thus the essential difference between the anatomy of a modern building and of a monolithic structure shows up as the difference—at every floor—between living, responsive arteries and dead, hardened arteries.

What we really make is time
FARMS THAT "GROW" CONCRETE TO BUILD A STRONGER AMERICA

Two of the strangest farms in America "grow" concrete in northern Illinois and central Georgia. They are the Portland Cement Association experimental farms, where scientists study the effects of weathering on concrete in northern and southern climates.

"Growing" here are better pavements for defense highways, stronger runways to resist the impact of huge commercial and military planes and the terrific heat of jets, walls with greater resistance to the elements for factories, schools, hospitals, homes, hangars, warehouses, stores and public buildings.

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The thermostat you see on the pillar in the photograph of Gordon's purse and glove section, right, is one of seven on the ground floor. Located near the main entrance, it gives area control and aids the entrance thermostat in compensating for cold winter drafts and hot summer blasts.

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The right number of thermostats for perfect comfort

As shown above, one of the keys to comfort in the Honeywell Customized Temperature Control System is the location of thermostats. Notice how this works on the floor plan—compensating for exposure, use and occupancy differences. Notice how special thermostats guard every entranceway, make up for elevator shaft heat loss and give general area control—all of which adds up to ideal comfort.

Instrumental in planning the installation of Honeywell Customized Temperature Control in Gordon's Department Store were Gary architect I. M. Cohen; William Goodman, consulting engineer, Chicago; William H. Stern, Gary, general contractor; Klingaman & Sons, Gary, air conditioning and heating contractor.

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ARCHITECTURAL FORUM • APRIL 1952
Sanymetal "Porcena" (Vitreous Porcelain on Steel) is a material, not merely a finish. It is in every respect unlike painted enamel or lacquer finished steel because it is fused to steel at a temperature of 1350°-1550°F. This impregnates the steel with vitreous porcelain enamel to the extent that it cannot be hammered out. Sanymetal "Porcena" (Vitreous Porcelain on Steel) is incomparable with any other material commonly used for toilet compartments. It is a lifetime material that stays new.
Sanymetal uses vitreous porcelain on steel for toilet compartments not only for its enduring beauty and fadeless colors, but because of its durability, low cost maintenance, cleanliness, resistance to acids, defacement and abuse. Vitreous porcelain on steel is a product of the white heat of the enameling furnace that is as new as tomorrow—and as old as time! No other material is so ideally suited for toilet compartments because it provides the utmost in sanitation and a degree of protection against obsolescence that is otherwise unobtainable. The sure way to perpetual cleanliness and a strictly modern rest room is to install Sanymetal Vitreous Porcelain on Steel Toilet Compartments. They are suitable and practical for all types of buildings—even for rest rooms and shower rooms in industrial plants.

Vitreous porcelain on steel provides these features that cannot be duplicated by any other material suitable for toilet compartments:

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Sanymetal "Porcena" (Vitreous Porcelain on Steel) Toilet Compartments are available in several different styles and a wide range of fadeless colors (refer to Sanymetal Catalog 89 for complete range of exact colors). Only Sanymetal offers "Porcena" (Vitreous Porcelain on Steel) Toilet Compartments. Ask the Sanymetal Representative in your vicinity to demonstrate the unusual and exclusive features of Sanymetal Vitreous Porcelain on Steel Toilet Compartments.

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- Statler Hotel, Washington, D. C.
- R.M.C. A., Penetacette, Florida
- Stevens & Wilkinson Bldg., Atlanta, Ga.
- St. Joseph's School, Chicago, Ill.
- Hall of Music Indiana University, Bloomington, Ind.
- John Morrell & Co., Ohtomano, Iowa
- Kentucky Home Life Bldg., Louisville, Ky.
- St. Charles Hotel, New Orleans, La.
- Dunbar School, Baltimore, Md.
- Michigan Bell Telephone Building, Bay City, Michigan
- A. C. Spark Plug Co., Flint, Michigan
- International Nickel Co., Bayonne, N. J.
- Clowes, Peabody Co., Troy, N. Y.
- Otis Elevator Co., New York, N. Y.
- Duka Power Co., Spencer, N. C.
- Beaver Harris Mills, Cananda, N. C.
- Armco Steel Corp., Middletown, Ohio
- Sunshine Biscuit Co., Daytona, Ohio
- Dormitory University of Tulsa, Tulsa, Okla.
- American Radiator-Standard Sanitary, Pittsburgh, Pennsylvania
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Kalistron — Color fused to underside of clear sheet of wear-resistant Vinylite. Plastic covering material.

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Demand Grows for Easing of Reg. X on Commercial Loans

With materials controls out of the way as the villain tormenting nondefense building, the industry this month turned on its tears over credit restrictions. For commercial building, the Federal Reserve Board's Regulation X requires 50% cash. To many a realtor and mortgage broker who has been unable to put together deals because clients lack that much money, the time seemed right for relaxation. Much speculative commercial building rises on 75 to 90% loans.

Said Marshall Davies of the Los Angeles construction firm of Davies, Keusder & Brown: "We lost two good jobs because of Regulation X. A few months ago we had a $500,000 hotel garage job, to which the owner gave a firm commitment. The Regulation X people knocked down our loan $110,000 below what we needed. Regulation X has stopped more building than any other factor."

Said Byron Shutz of Kansas City: "If they don't relax Regulation X on commercial building, the economy is going to suffer." He cited these Kansas City projects held in abeyance because of it: "a $75,000 doctor's clinic building, a $250,000 factory building, a block of stores including a supermarket, and a nine acre shopping development we ourselves were doing in conjunction with 300 acres of homes that we have build in the last five years. If Regulation X's limit were raised to 70%, a whole lot of projects would get going."

Said W. Laird Dunlop III of Washington's Walker & Dunlop: "I know of a $125,000 deal recently because of a $25,000 difference. The man owned his land and it would have been economically sound for me to up the value of his land to make the loan. But I wouldn't go that far because of Regulation X. But he found someone else to finance the building."

Formal request. The New York Building Congress put its plea to the Federal Reserve in writing: despite New York's special status as a distress area with a construction labor surplus and ensuing extra allotments, "we now find that a substantial backlog of commercial and industrial construction is prevented from going ahead by reason of Regulation X." Mortgage credit restrictions, the Building Congress' letter continued, were aimed at stopping inflation resulting from the war in Korea, but "in actuality, the demands of military production in the current year... will not approach anywhere near what was projected... (Instead) we have seen a growing deflation, a recession in business and the development of unemployment in various industries and areas even though most materials which were in short supply are now becoming available for civilian use."

It was precisely because winter's business hull might become spring's definite slump that the argument for immediate relaxation of credit curbs on commercial construction bore an air of urgency. Already, some retail store managements were shying away from new expansion plans because sales continued poor. Reported Mortgage Broker George Dovennmuehle of Chicago: "Regulation X was ok for a time, but it won't be necessary as business deteriorates. Owners of developments are not getting leases because business is not good, hence not expanding. Percentage leases particularly have been hurt. The big obstacle to commercial building is... general business conditions."

Substitute crutch. If nondefense construction—both commercial and local public works—got a big shot in the arm, it could take the place of the defense program as an economic crutch. But if government controllers prevent revival of activity until general business is definitely on the downgrade, construction decisions would be automatically postponed. This would reduce the chance of using construction as a booster at all.

At midmonth, Federal Reserve officials maintained that Regulation X had not dampened commercial construction—yet. But the Fed conceded that as more new starts get approval from NPA, credit might become a bottleneck. If credit curbs proved to be retarding the building in cities where the government recognized "critical" unemployment in the building trades, the Fed promised to review the situation.

Public backlog. Whatever the Fed did, public construction loomed as a major prop in the post-defense economy. Between 1941 and 1948, public construction totaled $30 billion less than either the prewar or the 1949-50 level. To make up that backlog, public construction might go up $5 to $6 billion a year for a decade—if enough financing is available. Biggest immediate needs: highways, schools and hospitals.

Also on the horizon—but not before 1953—was an upsurge in television and atomic construction. The Federal Communications Commission, ending its three-year freeze on TV station building, will begin hearings July 1 on granting of up to 2,000 more licenses. So construction should follow in about a year. The Atomic Energy Commission's plan to build a new $1 billion plant should mean construction about the time other defense projects taper off.
Angry Congress Studies Cut in Controls; NPA Gives Nondefense Building Big Boost

So much Congressional temper boiled up over government seizure of the steel plants that it began to look more and more as though Congress would whittle down federal controls over the economy considerably. As the Senate Banking Committee resumed consideration at midmonth of a bill extending the Defense Production Act beyond its June 30 expiration date, predictions most generally heard were:

- Congress will extend the law only until the middle of next winter, thus letting the next Congress decide whether to junk controls or continue them further.
- Price, wage and rent controls will be rean AIA-backed amendment exempting arch of the extension bill, but they will be pared
- Price controls or continue them further.
- The middle of next winter, thus letting the
- Congress would whittle down fed-
- over government seizure of the steel
- plants
- So much Congressional temper boiled up
- among them: the National Association of
- chieftly, it was the big
- drop in allocations for industrial expansion
- that caused steel companies to bank
- in March. 102.1% of rated capacity to 62.3%. This
- threat of a
- strike that caused steel companies to bank
- annual production.
- Los Angeles led the list with 57 projects worth $18,313,600. The New York-Northeastern New Jersey area stood next with 49 projects totaling $39,392,590. There was serious talk among controllers of relaxing the 15 month old ban on construction of theaters, night clubs, playgrounds and 44 other types of recreational structures.

Over the hump. Chiefly, it was the big
drop in allocations for industrial expansion
that made possible the increased steel for other building. Moreover, NPA built up its reserves significantly. And self-certification allowances were increased 23% over the second quarter to 90,678 tons. Such signs added statistical proof to the fact that the impact of the defense buildup on construction had nearly spent itself. NPA was busily shoring up construction in seven

Cost of strike threat. The threat of a strike that caused steel companies to bank their furnaces during the week of April 5-12 cut the industry's operating rate from 102.1% of rated capacity to 62.3%. This meant 626,000 tons of steel ingot production lost. (About a fifth of that, by the usual rule of thumb, was lost to the construction industry.) It was not too serious. It amounted to less than 1% of the nation's annual production.

About the only question DPA & NPA faced was how to do out the increasing supply of materials for building. Allotments of structural steel for the third quarter (bravely announced before the government averted a steel shutdown by seizing the industry) backed up NPA promises of a big boost for commercial building, schools, hospitals and highways. For commercial

building doled out by NPA's construction controls division, the 3d quarter allotment was 175% of the 2d quarter level. Principal allotments affecting construction:

STRUCTURAL STEEL (IN TONS)

<table>
<thead>
<tr>
<th>Agency</th>
<th>1st Qtr</th>
<th>2d Qtr</th>
<th>3d Qtr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dept. of Army</td>
<td>13,000</td>
<td>12,679</td>
<td>14,800</td>
</tr>
<tr>
<td>AEC</td>
<td>43,500</td>
<td>20,462</td>
<td>23,591</td>
</tr>
<tr>
<td>Dept. of Defense</td>
<td>163,490</td>
<td>212,628</td>
<td>219,191</td>
</tr>
<tr>
<td>Def. Elec. Power</td>
<td>137,976</td>
<td>148,500</td>
<td>12,000</td>
</tr>
<tr>
<td>Fed. Security Agency</td>
<td></td>
<td></td>
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<tr>
<td>Education</td>
<td>26,083</td>
<td>29,235</td>
<td>40,000</td>
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<tr>
<td>Hospitals</td>
<td>19,904</td>
<td>18,315</td>
<td>25,000</td>
</tr>
<tr>
<td>Gen. Services Admin.</td>
<td>4,500</td>
<td>4,550</td>
<td>5,000</td>
</tr>
<tr>
<td>HHFA</td>
<td>10,950</td>
<td>7,425</td>
<td>7,500</td>
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<tr>
<td>Petrol. Adm. for Def.</td>
<td>55,000</td>
<td>51,400</td>
<td>89,000</td>
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<tr>
<td>Bur. Pub. Rds.</td>
<td>50,000</td>
<td>80,000</td>
<td>125,000</td>
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<tr>
<td>Hblg. Mil. Div.</td>
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<td>5,345</td>
<td>5,100</td>
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<td>Constr. Controls</td>
<td>12,197</td>
<td>16,265</td>
<td>40,000</td>
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<tr>
<td>Index Expos.</td>
<td>360,768</td>
<td>208,140</td>
<td>182,000</td>
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that made possible the increased steel for other building. Moreover, NPA built up its reserves significantly. And self-certification allowances were increased 23% over the second quarter to 90,678 tons. Such signs added statistical proof to the fact that the impact of the defense buildup on construction had nearly spent itself. NPA was busily shoring up construction in seven
cities where unemployment was above 10%. NPA was not shown to
the 15 month old
minor components
not shown, to

NEW CONSTRUCTION ACTIVITY (expenditures in millions of dollars)

<table>
<thead>
<tr>
<th>Type</th>
<th>March</th>
<th>First Three Months</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$1 '51</td>
<td>$2 '52</td>
</tr>
<tr>
<td>Residential</td>
<td>862</td>
<td>784</td>
</tr>
<tr>
<td>Commercial</td>
<td>143</td>
<td>212</td>
</tr>
<tr>
<td>Military</td>
<td>376</td>
<td>233</td>
</tr>
<tr>
<td>Total</td>
<td>1,414</td>
<td>1,556</td>
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PUBLIC

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<th>Type</th>
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<tr>
<td></td>
<td>$1 '51</td>
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<tr>
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<tr>
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<td>39</td>
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<tr>
<td>Residential</td>
<td>377</td>
<td>372</td>
</tr>
<tr>
<td>Total</td>
<td>584</td>
<td>569</td>
</tr>
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</table>

A 5% cost rise? To most businessmen, the cards seemed stacked in labor's favor. (Two contractor representatives on the Construction Industry Stabilization Commission, AGC's James D. Marshall and Consulting Engineer Everett W. Dunn of Hartley, Iowa, called the 7 1/2% welfare announcement a "come and get it policy.") Practically everybody assumed labor would get at least 15%. So building costs would go up. In New York, estimated Dow Service, a 15½ wage hike would boost building costs 2 to 2 1/2, a 22½ increase would bump costs up 8 to 3 1/4%. On top of that would come the spiraling effects of whatever wage increase steel workers got. It looked as though labor would push building prices up about 5% this spring.
Jobs in Jeopardy: Truman Exit Means

Shakeup in Federal Building Officialdom

When Harry Truman bowed himself out of the Presidential race he probably yanked the rug from underneath some high-ranking government office holders concerned with the construction industry. If there is a change of the party in power there obviously will be many new faces on the Washington scene. But even if the Democrats stay in, a new President will mean substantial reshuffling.

**All shades of tenure.** In a gigantic government payroll, like that which has been multiplying for the past 20 years, there are all shades of tenure. Not even civil service officials and personnel experts can read off the cuff the names of those who are immune from the axe. Jobs, generally, fall into four categories:

- The appointive positions, like the General Services Administrator and the HHFA and FHA chiefs, which require Senate confirmation. Like cabinet officers, such job holders serve at the President's pleasure.
- The appointive jobs with definite terms, such as members of the Home Loan Bank Board. Courts have held that such office holders cannot be removed until their term expires except for misconduct.
- The special aides and department heads, who, through a bureaucratic code of ethics, are expected to submit a courtesy resignation when there own boss goes.
- Lesser fry whose jobs either had civil service rating (and thus antidischarge insurance) to begin with or who gained it for themselves in 1942. At that time the Ramspeck Act provided a mass conversion for those who, though they may not have been employed through a competitive examination, at least had held onto their job for six months.

Despite the degree of tenure, the whole bureaucratic applecart could be toppled over by a trick introduced by President Harding: a co-operative Congress first legislates the abolition of the particular office or department, then, with the personnel all brushed off, legislates its re-creation.

Central building bureau? Among heavy building agencies, two will be chiefly affected by the November elections:

- General Services Administration, headed by Jess Larson, which operates a central procurement service and maintains public buildings. This might well be abolished but not at the expense of its subordinate Public Buildings Service, headed by well liked Commissioner W. E. Reynolds, which could become the nucleus of an over-all engineering and construction bureau. This could include public roads, Bureau of Reclamation, and CAA's program of aid to state airport construction.

HHFA affected. The majority of light building agencies fall under the Housing & Home Finance Agency:

- HHFA Chief Raymond M. Foley, who was appointed to his $17,500 job in Dec. '47, is expected to bow out no matter what happens to the Administration. Those close to Foley say he is tired of dodging brickbats from both public housers and private enterprise and of trying to hold onto the reins of all housing agencies at once without the power to overrule any of them. Because HHFA's constituent agencies are so much on their own, Washington dope-sters figure it's not unlikely that a Republican administration would scrap HHFA entirely to save money. If Foley goes, most of the top HHFA hierarchy could be expected to resign also. Many have civil service status, but few have such protection in their present jobs. Affected will be B. T. Fitzpatrick, deputy administrator; Neal J. Hardy, assistant administrator; Nathaniel S. Keith, director of the division of slum clearance; and Joseph Orendorff, director of the division of housing research.

Chief subordinate of the HHFA is the Federal Housing Administration. Through longevity and absence of political domination, the FHA is just about as popular with Republicans as a New Deal agency

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To make possible the economies of fixed windows (30% cheaper installation, $4,000 a year cheaper air conditioning and less dirt), Architects Skidmore, Owings & Merrill (with aid from Otis Elevator Co.) blended together a new kind of machine to wash the blue glass sides of Manhattan's Lever House. The result was proudly exhibited this month by Lever Bros., as the soap firm moved in. It is a window washing gondola, hung by cables from the arms of a 10'/2 ton power plant car that runs on standard railroad tracks around the roof. To balk swing, sway and tilt, the gondola is clamped onto stainless steel tracks as it runs up and down the 21-story building. In six days, two men can wash the entire structure.
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can get. Because of earlier horse-trading with Congress, the bulk of its technicians — appraisers, underwriters, architects — enjoy civil service status. In a more precarious situation are the top men: FHA Commissioner Franklin D. Richards, appointed by President Truman August 11, 1947; Deputy Commissioner Walter L. Greene; Assistant Commissioner for rental housing Clyde L. Powell; Assistant Commissioner for underwriting Curt C. Mack; Assistant to the Commissioner Donald M. Alstrup; and the 72 district FHA heads, all appointed. (One is Harry Truman’s brother, Vivian.)

Another HHFA subordinate agency whose future seems to depend on the elections is the Public Housing Administration under John Taylor Egan, also appointed by President Truman. His chief aides are: Warren Jay Vinton, 1st assistant commissioner; Marshall W. Amis, general counsel; Roy M. Little, assistant commissioner for war emergency housing; Herbert L. Wooten, assistant commissioner for administration; Lawrence N. Bloomberg, chief economist.

A third HHFA subordinate agency, but in a relatively safe position because its members have definite terms and because it always contains at least one member of the minority party, is the Home Loan Bank Board. Members are William K. Divers and Kenneth G. Heisler, whose terms expire in June ’53, and J. Alston Adams (Republican member) whose term expires in June ’54.

In the most precarious position of all housing officialdom is Rent Stabilizer Tighe Woods. Since Congress last year put rent control under the defense economic stabilizer, the life of the entire agency now depends on war and politics. Moreover, it seemed inconceivable that Woods, who now serves at the pleasure of the economic stabilization, would survive a change of party.

In the Veterans Administration, all loan guaranty section personnel are blanketed under civil service, including chief T. B. (Bert) King. A topside VA shakeup could scramble things willy-nilly but an abrupt personnel change in anything so technical as guaranteed home loans promises so formidable a hassel as to discourage it.

On balance, 1953 will blow something between a tornado and a zephyr through the top brackets of federal construction bureaus, especially in housing, the building industry’s most political segment. At the moment, some jobholders had a good case of jitters. As one said: “How can we tell what’s going to happen? We’ve never had a change of government in the lifetime of this agency.”

Truman Acts to Strip Army Engineers of Civil Work; Atlas Rebutts Airbase Charges

Back from a Moroccan trip, a knowledgeable New York architect observed privately last month: “The air base mess may blow the Army Engineers right out of the water.” His words were barely out before it began to happen — and all too literally.

Perhaps motivated by the Missouri floods, certainly impelled by the debacle in North Africa, President Truman this month prepared a bill to reorganize the Army Corps of Engineers, give its rivers, harbors and flood control functions to the Interior Department’s Bureau of Reclamation under a new title: the Bureau of Water Resources.

The proposal was in line with the Hoover Commission’s recommendations for governmental reorganization. It would mean a big shifting of federal appropriations. The Army now gets $707 million for its “civil functions” and the Bureau of Reclamation’s slice of the current budget is only $3.6 million. Under the Reorganization Law, Congress has 60 days to veto such a Presidential proposal. It must do so by a majority of the membership of either house. With Congress out politicking during the election year build-up, a veto would be difficult. Moreover, the floods and air base troubles had tumbled the Engineers’ standing with Congress to a new low.

Bickering over “Project Atlas,” the program for building U.S. air bases in French Morocco, continued last month with the Atlas Construction Co., having its say for the first time. While everyone wondered why only two bases were under construction when five should have been completed within the first six months of 1951 (AF, Mar. ’52, p. 50), this much seemed pretty clear to an investigating Senate subcommittee:

> Brig. Gen. Orville E. Walsh had been sent in to relieve the two top Army Corps of Engineers officers in charge of the air base construction: Col. George T. Derby and Lt. Col. Leonard Haseman.

CANTILEVERED FOUNDATIONS planned for hillside apartments

Los Angeles architect-engineers Pereira & Luckman have evolved an ingenious plan to let realtor William Zeckendorf plunk a housing development in a narrow Los Angeles canyon hemmed in by steep hills. Buildings will rest on foundations cantilevered from friction foundation beams. The beams will be imbedded in hillside rock. The system averts expensive grading, should balk lethal landslides which often follow heavy rains in Los Angeles hills.

Closeup of single-family house planned on 12,000 acre “Mountain Park.” Initially, Zeckendorf hopes to erect an apartment-hotel (top drawing), apartment building, commercial area, five homes, recreation area and pool. Residents will use inclined elevator to reach top tier.
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It was Haseman who had Nousseur Air Base housing work halted and done over again when his wife, Violet, complained her new prefab was being set 25' from its neighbor instead of the scheduled 50'. The second installation involved double the roadway, plumbing, wiring and sewage cost.

The Air Force originally planned to rehabilitate four World War II bases which the U.S. had turned over to the French but instead switched to building five new ones (which the French also will have the option to take over).

"Project Atlas," originally slated to cost $300 million, was now estimated at $455 million ("because," said Air Force civilian engineer James Wise, "of rising construction costs and additional classified work").

"Project Atlas," originally slated to cost $300 million, was now estimated at $455 million ("because," said Air Force civilian engineer James Wise, "of rising construction costs and additional classified work").

Industry black eye. Contractors who feared the whole building industry was getting a black eye for revelations brought out in "Project Atlas" should have been encouraged by the statement of J. B. Bonny, chairman of the operating committee of the Atlas combine (private contractors Morris-Knudson, Bates & Rogers, Nello Teer, Mills & Bylhe and Porter-Urquhart; and architects Skidmore, Owings & Merrill, Associated). When Col. Harry Reed, chief of the Army Auditing Agency, said he found evidence of "fraud, mismanagement and waste" in construction of the bases, Bonny rebutted: "The job cost per sq. yd. is less than the original estimate by the Air Force." Instead, Bonny blamed the Army Corps of Engineers for lack of planning and for conflicting orders on the plans it did have. The Atlas combine also explained the high cost resulted from a French-U.S. agreement that purchase preference was to go to items available in Morocco.

MILITARY WASTE in building charged at Maryland base

A House subcommittee on government operations headed by Rep. Porter Hardy, Jr. (D, Va.) paid a call on the Andrews Air Force Base at Camp Springs, Md., found that not all of the air arm's wholesale distribution of the taxpayer dollar was confined to far-off North Africa.

Andrews, built in 1943 on a 4,489-acre site as a fighter-interceptor base for the protection of Washington, also provides facilities for the Military Air Transport Service. The Hardy Committee's investigation was prompted by Andrews' new expansion

NEW PRICE INDEX of Bureau of Labor Statistics shows wholesale building materials prices on a postwar (1947-49) base instead of a 1926 base. Two years in the making, the new index unveiled last month is considered a far more accurate tool than the old one. It has 45 more components and far fewer nonbuilding elements than its predecessor. Instead of feeding all lumber and wood product prices into the over-all index, for instance, the new series selects only lumber actually used in construction, eliminates wood program. The committee's observations, published last month, received scat attention in the nation's press but included serious accusations:

- An airplane wash rack, budgeted for $14,000, turned out with a final cost estimate of $100,000 as plans grew fancier and fancier after Congress voted the money. Usherp: The Air Force shielded the project entirely.
- A bachelor officers' quarters building, scheduled to have 20 rooms, ended up with 40 because the Army Engineers misread instructions, sent out the wrong specifications. An extra $22,000 was spent on it because it was built on swampland (where four other BOQ's are still scheduled to go up) and an extra $7,000 was tossed in to get it up in 60 rather than 90 days (which, prorated among its WAF occupants, cost the government $13 per day per WAF—"double what it would have cost to put them up at the best hotel in Washington").
- "There is reason to believe rehabilitation of the existing barracks at Andrews will eliminate the need for seven new buildings authorized in the 1952 program and result in a saving of about $3 million." (Existing enlisted men barracks were declared "beyond economical repair" without anybody inspecting them of estimating how much it would cost to rehabilitate them.)
- Of Air Force plans to spend $750,000 to house all bachelor officers stationed in Washington in three new BOQ's at Andrews, the committee showed that the air arm seemed to be using the
ALL ROOF DECK MAY LOOK ALIKE, BUT... knowing a few important differences can save you construction time, trouble and expense. Here's what to look for:

EFFECTIVE SHAPE—Are you getting maximum sheet strength? You are if the roof deck you select has been designed to obtain the proper relationship between rib and flat. To give maximum strength and cover per pound of steel, there must be a proper ratio between these rib (tension) and flat (compression) sections... the same relationship you find in Granco Roof Deck! In addition, Granco Roof Deck has the same thickness as a 2' x 4' giving maximum flexibility for architectural design.

WIDE COVER WIDTH—Will an excessive number of side laps weaken the roof? An expanse of frequently lapped sheets cannot possibly offer as much resistance to concentrated loads as a wide seldom-lapped surface. That's why it's best to select roof deck for maximum width with a minimum number of laps. Granco Roof Deck has a wide cover width of 28¾"... wider than most competitive brands. That means more strength and safety, less welding, and on large jobs, a considerable economy in laying time.

UNIFORMITY—Are the patterns identical in every sheet? In most brands of roof deck, yes. But, there are exceptions. When hands and human judgment are employed in the forming process, slight sheet variances must occur. These variances are greatly multiplied when sheets are placed end-to-end. Don't risk improper fits, endless re-matching of sections and slow, costly job progress. Specify GRANCO STEEL ROOF DECK because Granco sheets are rotary press formed, machine-made for uniformity and perfect fit. "Sheet crawl" is virtually eliminated.

ATTRACTIVE DURABLE FINISH—How will it look in 5, 10, 15 years? Of course, that will depend largely on weather and atmospheric conditions in your locality. But, some roof deck is better prepared to withstand age and oxidation than others. Granco Roof Deck, for example, is protected with a tough, rust-resistant alkyd resin, baked on for longer life. Granco Deck looks better, lasts longer, creates a striking panel effect for ceilings, too.

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Korean war as an excuse to build nonessential facilities just because appropriations were easier to get. Said the report: "We cannot countenance any attempt by the military to use the present emergency as a rip opportunity to provide themselves with facilities and equipment they can presently do without but which they might have difficulty securing funds for at some later date."

Forty new dormitories at Andrews, now under construction, "are as good if not better than any college dormitory in the country. (They have not) even a scintilla of the 'austerity' which is supposed to characterize the military public works program."

The committee recommended a more sincere attempt at defining temporary or semipermanent construction. The present "10 year life" barracks it estimated will actually last 75-100 years. So similar are they to the "25 year life" barracks there is only a 4% difference in cost. On more questionable grounds, it also rapped the Air Force for using its new two-man bedroom standard for barracks as a justification for reconstructing or replacing old but serviceable buildings. Concluded subcommittee chairman Hardy: "In building up we must keep ever present in mind the possibly more imminent danger of spending ourselves to bankruptcy."

RENegotiation: reports from gov't. contractors due May 1

After holding up its preliminary regulations for contractor and business groups to shoot at, the Renegotiation Board was ready this month to start squeezing excess profits out of the defense program. Building and other contractors must file initial statements with the board beginning May 1, tell how much income they received from government work during 1951. Similar reports will be required later for years through 1953.

The law applies to all contracts and subcontracts for specified agencies where the amounts received from the government total $250,000 or more a year. Architects and engineers are included if their annual business with Uncle Sam grosses this much. Work for exempt agencies does not count toward the total.

What is defense work? In framing the law, Congress granted much more administrative latitude than usual. No formula for measuring excess profits is provided. There is no complete spelling out of exempt and nonexempt agencies. In general, the board has decided that bureaus and departments that play no major role in the defense program are to be lifted out from under the act.

On the exempt list are the small amount of construction activities the Public Buildings Service is carrying on at this time, the Bureau of Public Roads, and the HHFA—except for its direct construction and trailer purchasing activities under Title III of the Defense Housing Program. Subject to the renegotiation are contracts by such agencies as the Army, Navy, Air Force, Coast Guard and AEC.

Competitive bids, too. Before the program was whipped into final shape, the Associated General Contractors failed in an effort to persuade the board that contracts awarded on a competitive bid basis be placed outside the act. Argued AGC: when a contractor takes such a gamble he should be allowed to win as well as lose. The board's rejoinder was that it could not go quite so far but would give the risk factor sympathetic consideration in shaving down profits.

As board officials visualize the operation, most contractors will be given a clean bill of health after their preliminary reports have been scanned. Even where further scrutiny is found necessary, they believe that in all but 5% of its cases a voluntary agreement can be reached.

WAGE OVERPAYMENTS: WSB upholds Hedlin guilt, cuts penalty

Although upholding its regional enforcement commission in finding the J. D. Hedlin Construction Co., of Washington D.C., had violated wage restrictions (AF, Feb. '52, p. 49), the Wage Stabilization Board this month halved the company's penalty.

Hedlin was found guilty of paying bricklayers over scale last year to draw them from Detroit to the lower-pay Ann Arbor area where the company was building a VA hospital. The regional WSB refused to allow the company to deduct $40,000 (the extent of overpayment) as an income tax business expense and directed the VA to withhold $40,000 from its bill.

Hedlin claimed the WSB lacked the authority to interfere with a cost plus fixed fee contract. In hearing the appeal, the three-man WSB in Washington side-stepped that point and therefore had to ignore the withholding directive to the VA. Hedlin now plans to appeal to federal courts.

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<tr>
<th>ELEMENTARY</th>
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<td>Unsatisfactory</td>
<td></td>
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<tr>
<td>Satisfactory</td>
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EDUCATORS URGE SCHOOL BUILDING BOOM

If the cries of alarm from educators meant anything, the U.S. was getting closer to a monster school building boom. The U.S. public school system, said U.S. Education Commissioner Earl J. McGrath this month, is "in danger of a breakdown . . . unless we take immediate steps to provide more classrooms and teachers." Because school construction was neglected, first in the depression, then in a war, and lately under CMP, the backlog need for schools "is very much worse than any time during the last 25 years," he explained.

To a House committee, McGrath cited the shocking results of a survey of school needs in 25 states which enroll 44% of the nation's public elementary and secondary pupils:

- 40% of the schools are over 30 years old; one in every six is over 50.
- 15% of classrooms have less than 15 sq. ft. of floor space per pupil. Another 31% have not over 20'. (Educators agree 30 sq. ft. is essential.)
- Considering items like structural stability, fire safety, education adequacy, a shocking 40% of the schools were rated "unsatisfactory" by state or local educators (see cut).
- 30% of the schools were below minimum fire safety requirements (for one-story buildings, only isolation of furnace rooms; for two-story buildings, fire resistant outside walls, stairs and corridors; for three-story structures, fire resistant throughout except wood floor cover and trim). (See cut.)

Result, as computed by McGrath, is that the U.S. schools need $659 million of rehabilitation and remodeling, $8.7 billion of new construction now. On top of that the World War II baby crop confronts schools with a 25% increase in pupils by 1958. Compared to the $10 billion (or $2 billion a year) thus needed to bring U.S. schools up to date by 1957, the nation was spending only $1.3 billion on its schools in fiscal 1951-2.
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There's no need to compromise on lighting that's "almost" right. Miller has a complete line of luminaires—Fluorescent, Incandescent, and Mercury-vapor—that cover a wide range of industrial and commercial lighting requirements—that have been proven in thousands of installations.

Light with confidence the proven Miller way. Miller field engineers and distributors are conveniently located for nation-wide service.

Miller lighting systems make it possible to meet the ever-increasing demand for maximum lighting efficiency. That's because Miller luminaires are engineered for easy installation, low maintenance, and long service, resulting in finest dollar-for-dollar value. Behind them are 108 years of pioneering and progress in GOOD LIGHTING.

There's no need to compromise on lighting that's "almost" right. Miller has a complete line of luminaires—Fluorescent, Incandescent, and Mercury-vapor—that cover a wide range of industrial and commercial lighting requirements—that have been proven in thousands of installations.

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HEATING PRODUCTS DIVISION: Domestic Oil Burners and Liquid Fuel Devices
ROLLING MILL DIVISION: Phosphor Bronze and Brass in Sheets, Strips and Rolls
Near-Airport Land Values Unaffected by N.Y. Crashes as Homes Encircle Runways

Airborne catastrophe was becoming tragically habitual around New York City this spring. The resulting public uproar posed Gordian problems not only for the airline industry, dependent for its livelihood on access to metropolitan mass markets, but for the real estate industry whose laissez-faire approach to land use around airfields might be forced into drastic revision.

Even on a pyramid. After the American Airlines Convair crash at Newark Airport Feb. 11 (killing 28 passengers and four residents in Elizabeth, N. J., homes) the New York Times commented: "In an age of air travel we can expect accidents, and it is impossible to move wholly away from danger. One might say one is not safe from an airplane accident... even on top of a Mexican pyramid (where two were killed and one injured a week later), or in an office in the Empire State Building (where 13 were killed and 25 injured when a plane clipped the building's 79th floor in 1945)."

The Times's fatalism was not shared by the people of Elizabeth. Having tallied three crashes and ten resident deaths during a two-month period, they demanded Newark Airport be shut down permanently as a hazard.

On April 5, a C-46 cargo plane crashed in the middle of a Jamaica, Long Island, residential section. Five persons (three of them residents) were killed. Thirteen others were hurt. Five homes were destroyed. The plane had missed its landing at New York's mammoth Idlewild Airport. Two days later, four New York City councilmen were demanding that both Idlewild and La Guardia Fields be shut down.

Localized furore. The New York area uproar, however, gave no sign of spreading elsewhere across the nation. Explained realtor A. B. Cass of Dallas, who specializes in property around Love Field: "I am convinced that commercial airliner crashes have to happen in your home town to have any appreciable effect on property values near your airport."

Many communities were nonetheless busy with zoning regulations to restrict building in the path of runway approaches. But in at least as many more, judging from a FORUM survey of eight major U. S. airports, homes and industries were mushrooming unrestricted on the edge of airports where they face the same perils as Elizabeth.

Two-mile safety belt. The FHA, in an analysis last July of residential areas near airports, found major airports should be at least 2 mi. from homes. Reason: glide angles currently in use put planes at 210' to 350' above ground 2 mi. out. (AF, Feb. '52, p. 148.)

Said FHA in outlining an "effective area of objection" to homesites around airports (see diagram): "The resulting noise, vibration and hazard—psychological as well as real—of low-flying aircraft will have a depressing effect upon the desirability and marketability of land..." In two cities, FHA had acted to back up its policy.

In Tulsa, FHA banned its insurance on loans in areas near Municipal Airport—partly because heavy C-47 jet bombers manufactured there soon would be using the runways.

In Seattle, FHA refused to insure further loans in the Boeing Field area Jan. 1 because it considered the lengthening of a field to accommodate the new Boeing XB-52 a threat to the homes built right across the street. The field is less than an air mile from the downtown's center and planes fly as low as 50' over houses tops a block from the field's north end. The Elizabeth crashes had no effect on property values because, as one realtor put it: "Since a nonsked plane crashed into a house 18 months ago property values around the field have been so low they couldn't get worse."

Zoning controls. Even in some cities protected from take-off and landing crashes by geographical advantages, zoning laws restrict developments close to approach zones.

In Boston, which considers its Logan Airport the best-protected in the U. S., the field is a filled-in peninsula with practically all take-offs and landings made from the water side. Although the field is only 20 mins. from downtown Boston, its unique location jutting into the harbor keeps planes at a minimum 1,000' altitude over the nearest residential areas. Zoning regulations, passed this year by the Massachusetts legislature, temper new building heights for a radius of 5 mi.

In St. Louis, the airport is 14 mi. from the center of town—way out—and housing is the optimum near the home. FHA diagram. Approach zones for noninstrument runways usually flare from 500' wide at the edge of a field to 2,500' 2 mi. out; approach zones for instrument runways spread from 1,000' at field's edge to 4,000' wide 2 mi. away.

2 mi. away from the instrument runway's approach zone. However, developments are now being considered on land within the approach zones. The city, afraid of starting a land speculation run by buying up property, is instead trying to get its suburban municipalities to co-operate in zoning future construction out of these approach zones.

In Kansas City, Mo., a city ordinance limits building heights around Municipal Air Terminal from 50' to 106', depending upon the building's proximity. When a builder tried to put up four 12-story apartments on a bluff near the airport's north approach two years ago the airlines protested. The builder compromised by erecting five 10-story apartments instead and moving them back from the bluff.

Schools by runways. In at least three cities community complacency ignores the fact that residential areas are jammed right against the airport:

In Dallas, planes landing at Love Field fly 250' above homes abutting the instrument runway. Residential developments are adjacent to two sides of the field, ½ mi. from the other two. Although the Elizabeth crashes had no effect on land values, a local crash in 1949 (killing 28 persons) brought "a terrific turnover" for eight to 12 months.

ARCHITECTURAL FORUM • APRIL 1952
Santa Rosa Hospital Built for Reliability... and Selected

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HEAVY-DUTY BOILERS

SANTA ROSA HOSPITAL, San Antonio, Tex.
PHELPS, DEWEES & SIMMONS, Architects
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By specifying Kewanee Heavy-Duty Boilers, for 100, 125 or 150 pounds working pressure, large institutions can be certain of dependable heat at all times with an ample reserve for emergencies... plus high pressure steam for kitchens, laundries, sterilization and other equipment.

Pictured is the Santa Rosa Boiler Room with its battery of 2 Heavy-Duty Kewanees each of 270 HP... producing a total of 15,000 lbs. steam hourly.
In Los Angeles, although the Municipal International Airport is 15 mi. from the downtown section, factories and homes have clustered so close to the field planes fly as low as 50' over their roofs. Even when 1,000' in the air, the planes flicker TV images and vibrate houses. Sabre jets, making their final "break go-around" tests, scream through the neighborhood. As one Inglewood realtor explained: "The few normally nervous people either don't buy here or move out quickly. Because of all the industry springing up around the airport (to facilitate air freight shipments) people are mad for property in this area. Hell, they would buy right alongside the runway if they could get it."

(Inc. Pomona, north of Los Angeles, a new Convair guided missile plant has pushed realty values near one of the city's two airports from $4,000 an acre to $30,000 and $40,000.)

In Chicago, residential property adjacent to the mile-square Midway Airport has actually increased in value the past few years ($30 to $50 a front foot for 30' to 40' wide lots). Said one home-builder: "You don't get disturbed by anything unless you become immediately affected by it yourself." This complacency is pointed up by the fact that 3,500 of the 4,500 homes built near the airport during the past three years are occupied and 1,000 more are shuddering. The only civic protest occurred several years ago when the roar of planes taking off and landing on the southwest runway made teaching hectic at the Hale Elementary School, on the south edge of the airport. Upshot was that airlines promised not to use the runway during school hours.

Dilemma. In general, residents object to airports because of the safety factor (future Elizabths), noise, heavy night illumination, and the motor traffic that brings the passengers and freight back and forth.

The Urban Land Institute has taken the stand that airports and residential areas are "incompatible"—there should be 10 to 20 mi. of open country between them, even if it means instituting a helicopter commuter service. ULI Director Max S. Wehrly says this should be retroactive: in other words, Newark Airport should pack up and move out.

Despite ULI's safety arguments, municipalities are well aware of the business an airport brings. They know that the public chooses air travel as a time saver and that banishing an airport to the hayfields will diminish that time saved. Even though Newark Airport is still closed to commercial flights, it is doubtful northern New Jersey can long be without a major airport.

Most students of the problem say the answer lies not in abandoning airfields, but in increasing their safety factors and in subordinating adjacent residential development to the more primary requirements of runway approaches. This is the problem currently confronting Lt. Gen. James H. Doolittle, who heads a Presidential commission studying the location and use of airports. The commission, formed after the third Elizabeth crash, will present its findings to the White House by May 20.

PEOPLE: lumberman named DPA construction chief; Perkins & Will to do Field shopping center; Imperial Hotel shakes off its colonels

Appointed as Deputy Defense Production Administrator in charge of construction and resources expansion was John H. Martin, 39, president of United Lumber Yards, Modesto, Calif. Heading a new set up of DPA's former offices of resources expansion, Martin will be the key policy man in all DPA decisions affecting industrial construction.

Thus DPA belatedly named a top-level construction coordinator, months after the real need had ended. Martin's will be the needed signature on DPA activities affecting tax amortization, industrial expansion loans, procurement loans and advance payments to industry. Martin served five years with the War Production Board. He succeeds troubleshooter James F. King, who is to become DPA representative on the International Materials Conference.

Chicago architects Lawrence B. Perkins and Philip Will Jr. won the coveted assignment of designing the giant Marshall Field & Co. shopping center at suburban Skokie, Ill. (Dec. issue '51). The $25 million center, now named Old Orchard (to suggest the "casual country atmosphere"), will occupy 110 acres, have room for 90 stores, 7,000 cars. Field itself plans to mother its nest with a 350,000-400,000 sq. ft. branch store. Perkins & Will are preparing final plans, hope to break ground before the end of the year—the government willing. Perkins & Will's plan won out over Skidmore, Owings & Merrill; Howard T. Fischer & Associates; and Shaw, Metz & Dolio. Field bought all four sets of plans.

The American Army generals moved out of Frank Lloyd Wright's Imperial Hotel the first of this month and the people of Tokyo knew the war was really over. Gone were the Very Important Persons and the very top brass who with rent-free suites and 40¢ banquet repasts never had it so good (colonels' ladies now and then had to be restrained from walking through the lobby in slacks and halters). The Japanese took over with a flourish, announced rooms would now be $5 to $40 a day, passed canapes to the tune of "The Roses Are Blooming in Picardy" and had the Emperor's daughter on hand to lend social endorsement. Wright sent a telegram of congratulations.

After a facts-of-life talk by Walter Gropius, knowledgeable chairman of Harvard's School of Architecture, members of the Chicago chapter last month became the first AIA group to study lifting the traditional ban against an architect engaging in building contracting. Said Gropius: "Architects must regain the medieval role of (Continued on page 60)

CHILDREN'S HOSPITAL gets plug from Disney in fund raising

Resourceful Texans, anxious to raise funds for a much-needed Texas Children's Hospital (July issue '51) persuaded Walt Disney to draw the cover for their money-hunting brochure. Disney obliged with a Mickey Mouse-Donald Duck's eye view of the completed structure. The campaign opened in February and so successful was the approach that $400,000 of the needed $1.2 million ($1.35 million had already been raised from foundation gifts and horse show proceeds) came pouring in by the end of last month.

Already under construction, the hospital occupies 6 acres of Houston's Texas Medical Center. Architect Milton Foy Martin has designed a five-floor, 100-bed structure that will have a large auditorium, an outpatient department, pediatric diagnostic laboratories, private rooms for worried parents to stay overnight and, for the kids, a toy shop and soda fountain.
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Due to the complexities of modern flooring materials available today, selection is increasingly a job for trained flooring experts... men like the Kentile Flooring Contractor whose years of study and experience qualifies him to choose the right floor for every installation... the one floor that has most to offer in appearance, durability, and economy in the use to which it will be put.

Whether the problem is one of new construction or the remodeling of existing facilities, the Kentile Flooring Contractor is available night and day to help you select the floor that will give you the most for your money. Call on him as you would any member of your actual staff.

KENTILE Asphalt Tile is preferred for commercial and industrial installation, large and small, because it always looks fresh and new in spite of constant daily traffic... resists dirt, stain and wear for long years of easy, inexpensive cleaning...retains its original, locked-in colors with only an occasional no-rub waxing. And, Kentile's low initial cost plus speedy, tile by tile installation over any smooth, firm surface provides money-saving advantages where business must continue without cost-consuming delay.

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KITCHEN AREAS in the restaurant and luncheonette in the building are equipped with U-S-S Stainless Steel, a material that has proved unsurpassed for cleanliness and ease of maintenance in food preparation areas.

HEART of the building's mail system is this central room where a steel conveyor, electrically-operated, carries baskets to distribution offices on each floor. Table tops in the mail room and handcarts for the mail girls are U-S-S Stainless Steel.

ONE of the largest private branch exchanges in the world handles telephone traffic in United States Steel's new headquarters. Literally thousands of miles of wiring and much equipment, using a great deal of steel, serve the 2,000 dial stations in the building.

TWO automatically controlled air-conditioning systems made up of miles of steel pipes and ducts provide uniform temperature, humidity and air cleanliness through all seasons of the year. Conditioned air is brought into individual offices through steel window enclosures like the one shown below.

A TYPICAL reception area on one of the office floors of United States Steel's new headquarters at 525 William Penn Place shows how attractively the Stainless Steel elevator doors are combined with carbon steel panels finished in baked enamel.

WASHROOMS, in the center section of the building, have pleasingly colored walls of porcelain-enamed U-S-S Vitrenamel in large panels.

UNITED STATES STEEL
UNITED STATES STEEL COMPANY  ·  525 WILLIAM PENN PLACE  ·  PITTSBURGH, PA.
Only STEEL can do so many jobs so well

COMpletely VERTICAl window spandrel, window frame and fin assemblies in Stainless Steel are outstanding in this clean-cut design. The venetian blinds are of painted carbon steel.

ROOF FLAShING is U-S-S Stainless Steel for long life and reduced maintenance. It's one of the many architecturally interesting and important uses of Stainless in the building's construction.

STAINLESS STEEL spandrels—3300 of them—were fabricated with Stainless window frames, windows and fins to form complete assemblies. A temporary plastic coating protected the spandrels during shipment and erection and was peeled off after installation.

CELLULAR STEEL FloORS carry electrical and telephone cables that can be tapped at almost any exposed point. In addition, light fixtures, air-conditioning ducts, acoustical blocks and even ceilings themselves are suspended from this cellular flooring.

STRUCTURAL STEELWORK on the 41-story building was handled by the American Bridge Division of United States Steel Company. Only 138 working days were required from the time the first column section was raised until the 520-foot building was "topped off." Fifteen thousand tons of framework steel are used in the structure.
Lower Installation Costs
York Unitary Air Conditioning can be installed in existing buildings where space is at a premium or the cost of ductwork prohibitive—or in buildings under construction where the required number of units can be installed more economically than a central system. Only three pipes are required—water supply and return, and drain. To facilitate piping, both right and left hand units are available. Each York Unitary Air Conditioner has an outside air plenum which allows you to locate the outside air intake anywhere from window sill to floor level.

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Each York Unitary Air Conditioner has its own controls. During holidays, weekends, nights when only a few tenants are present, only part of the system need be operated to condition the spaces actually occupied. Cleaning and redecorating costs are kept to a minimum because all air—recirculated as well as outside air—is filtered.

Minimum Space Required
In the engine room, only space for a central water cooling system is needed. No air handling equipment is necessary. In the rental area, the compact York Unitary Air Conditioner takes up little space . . . can be partially recessed into the wall.

Your nearby York Representative will be glad to show you how this latest York advance in more economical, more efficient air conditioning can save you time and details . . . save your client money and space. See him today or write York Corporation, York, Pennsylvania.

Model CF-300 illustrated. Built in sizes with capacities from 5000 to 14,000 Btu's/hr. Contain direct connected centrifugal fans, water coils, and filter. Factory assembled and tested.

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Headquarters for Refrigeration and Air Conditioning
WRIGHTFLOR RUBBER TILE in lens grinding plant of Bausch & Lomb Optical Company at Rochester, New York.

**Even ground glass doesn’t bother WRIGHT RUBBER TILE**

Bausch & Lomb had a severe problem in their plant at Rochester, New York. They needed a floor covering that would stand up under a constant bath of kerosene, oil, abrasives used to grind lenses, and the ground glass itself. It sounded like an impossible problem.

They installed promising floor coverings of different types in areas where conditions were most severe. At the same time they tested samples in their laboratory. All tests indicated that WRIGHTFLOR was by far the best of all materials tested. Successful service on the job was final proof that WRIGHTFLOR would stand up.

Bausch & Lomb now has over 40,000 feet of WRIGHT RUBBER TILE in their plant and are replacing office floors with WRIGHT as soon as the present floors become worn.

Your floor covering requirements probably are not nearly so severe as those of Bausch & Lomb, but this performance record is proof that you can take advantage of the beauty, comfort, safety and ease of maintenance of WRIGHT RUBBER TILE in every installation.

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**FLOORS OF DISTINCTION**

- WRIGHTEX—Soft Rubber Tile
- WRIGHTFLOR—Hard Surface Rubber Tile
- WRIGHT-ON-TOP Compression Cove Base

Below, WRIGHTEX RUBBER TILE in Bausch & Lomb display room.

Texas Glenn McCarthy, the laird of Houston’s Shamrock Hotel, the McCarthy Gas & Oil Co. and the McCarthy Chemical Co., met financial come-uppance at the hands of New York’s Equitable Life Assurance Society. McCarthy was about to form Glenn McCarthy, Inc., a wildcatting venture for which ten million shares of stock would be sold at $2 each. Equitable, which has lent McCarthy $34 million for the Shamrock and the gas and oil company (Metropolitan Life staked him to the chemical company at $20 million), didn’t like the idea of its debtor spreading his talents so thin. Said Warner H. Mendel, Equitable counsel: “Equitable believes Mr. McCarthy should be required to devote all his time and energy to the new enterprise and that, therefore, his connection with the old companies must be terminated.” Equitable set no time limit but strongly hinted that since McCarthy has fallen behind in his loan amortization (though not in interest payments) the next action might very well be foreclosure.

Los Angeles architect-city planner Robert E. Alexander found business so brisk last month he decided to close his own office and concentrate on his joint business with architect Richard Neutra. On their agenda: a redevelopment plan for Sacramento, Calif.; the designing of Elysian Park, a super Los Angeles public housing project; and a mammoth physical and economic program for Guam to keep the island’s civilian economy flourishing after the Navy and Air Force construction programs peter out. The two architects’ ten year contract with Guam guarantees them a minimum of $25,000 annually and a maximum of $75,000, plus travel costs and living expenses while visiting the island.

For 45 of his 80 years New York architect Electus D. Litchfield has been fighting to... (Continued on page 62)
A remarkably useful unit with dozens of applications

Modine Cabinet Units meet the requirement for fast, positive and quiet distribution of heated or cooled air — where the expense and elaborateness of unit ventilators or air conditioners are not warranted.

Models for heating with steam or hot water ... cooling with chilled water. Cooling models may be used for both chilled water cooling and hot water heating.

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Type CR with face outlet grille and plenum base for recessed installation. This unit for heating only.
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UNISTRUT offers this Spring-Held Clamping Nut which ties together both sides of the slotted channel and forms a Box Section at points of connection for greater load strength.

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The World’s Most Flexible All-Purpose Metal Framing
Tips on FANS

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Centrifugal fans like this "Buffalo" Limit-Load model are generally the first choice for large ventilation, exhaust and air conditioning systems. Their efficiency is high even when installation is at a curve in the duct. Medium speed fans, they are ideal for handling large volumes of air quietly at medium pressures. "Buffalo" Limit-Load Fans have the additional advantage of being non-overloading, regardless of the system pressure. For further factors in the selection of a centrifugal fan, write for Bulletin 3737.

Axial Flows on the other hand, move air by the propeller principle, straight through the fan housing. These fans will thus be most efficient mounted in straight runs of duct. They are ideal for light-duty ventilation and air conditioning service at pressures to around 2". Axial Flows are higher velocity fans than centrifugals, are lighter weight and more compact than centrifugal fans, therefore lower cost for duct-mounting on ceilings, walls, etc. However, the performance curve is often the last analysis in your choice of fan for each job. "Buffalo" Bulletin 3533-C contains a comparison performance chart of both "Buffalo" Limit-Load Fans and Axial Flows. A copy will be mailed to you on request.

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Along America’s Southern Riviera and San Francisco’s mountain retreats, in towering office buildings and neat little Cape Cod homes — here you’ll find slender-styled all-aluminum Miami Awning Windows.

- Constructed from extra-heavy aluminum alloy sections (63-ST5). Both sides of vent sections are actuated with equal pressure through a patented, concealed torque shaft allowing easy, balanced opening and closing.
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William T. Vaughn, Architect

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In appearance and in the enduring Serviceability which their quality assures Weisways are eminently suited for use in today's finest buildings. For detailed information, write to the address provided.
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Look out! There's trouble in the air!
Maybe it's dust or dirt. Maybe it's cinders or fly ash.
Whipped in by wind — and washed around by rain — these trouble-makers gang up on a roof.
But they don't get far against roofs made of Monel®!

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Right now — because of the demand for nickel and nickel alloys in the defense program — Government orders prohibit use of Monel for building applications.

But the time will come again when there is enough Monel available for normal roofing needs! Meanwhile, let INCO help you in planning for the future. Call on our Architectural Section for the latest technical information and literature.

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Explain yourself, Miss Smith!

"Why naturally I've enjoyed work more since we got the Autophone!"

"With the Autophone, my board doesn't get jammed with inter-office calls — the automatic dialing leaves me free to handle long distance and important outside calls.

And judging by the way everyone in the office uses the Autophone, they must love that 'one-shot dialing'."

Chances are, your "Miss Smith" has a full day handling outside calls and expediting long distance messages. Why not relieve that jammed-up board by installing an Autophone System to handle your inter-office calls for more speed and efficiency?

It will save you money too! Write, outlining your requirements, for information on the Autophone System best suited for your particular need.

COUCH AUTOPHONE SYSTEM

... 30 or 50 line systems ... "one-shot" dialing saves time, eliminates manually operated switchboard ... simple, rugged, inexpensive.

Private telephones for home and office ... hospital signaling systems ... apartment house telephones and mail boxes ... fire alarm systems for industrial plants and public buildings.

S.H. COUCH CO., INC.

DEPT. 300 • NORTH QUINCY 71, MASS.

BUILDING MATERIALS sales rise to fourth in U.S. retail trade

Retailers of building materials and hardware were grabbing a bigger share of the U.S. consumer dollar. Reported the Dept. of Commerce: between 1948 and 1951, building materials and hardware moved up from sixth place to fourth place among the nation's retailers, passing apparel and department stores. Last year, building materials and hardware men accounted for 7.1% of the country's $150.6 billion dollar retail trade. Ahead of them: food (24.5%), autos (17.6%) and eating and drinking places (7.5%).

APARTMENT FOR AGED planned under FHA Title 7

Boston is planning to build the U.S.'s first apartment development designed exclusively for old people. The $1.8 million project was born when the Home for Aged Colored Women came to the Housing Association of Metropolitan Boston with a proposal to build a third class hotel to take care of some of the 600 aged in Boston's South End. Association Director William C. Loring Jr., persuaded the Home to switch to FHA Title VII (which requires only a 10% investment, permits 40 year amortization and lets the Federal government and city pay two-thirds of the site cost). The Home for Aged Colored Women agreed, gave $250,000 to the Commonwealth Housing Foundation.

Last month, architects Hugh A. Stubbins Jr. and James Lawrence were planning a six to eight-story building with 300 apartments accommodating 400 people. There will be kitchenettes for those able to do their own cooking and a central cafeteria for those who can't, common rooms on each floor, medical and recreational facilities and elevators (Lawrence, after extensive studies of similar building in Scandinavia, discovered old people distrust ramps). Construction is to start within a year.

Rents will vary from $42 monthly for those on old age-assistance to $65 for those financially independent. Half the tenants will be from 55 to 65 (to discourage the "last lap" atmosphere) and the rest over 65.

Bostonians are convinced they have a good thing. A recent geriatric study showed that although old folks in rural areas traditionally live with their relatives, 70% of those in urban industrial communities prefer to live in their own place. (The HHFA, in a recent study, found the U.S.'s 11 million oldsters (over 65) were worse housed than any other segment of the community.

HHFA officials have indicated they may ask Congress to set up a special housing program to take care of this group.)

(NEWS continued on page 70)
MUNICIPAL BUILDING in historic Hamilton, Ohio, is air conditioned throughout with Frigidaire equipment

Overlooking picturesque Memorial Park and Miami River, the Hamilton Municipal Building is an imposing landmark in this pleasant Ohio city.

City council chamber is dominated by mural depicting the founding of the city's predecessor, Fort Hamilton, by General "Mad Anthony" Wayne, in 1791.

A city government that has taken advantage of modern refrigeration equipment to facilitate and improve its activities can be found in the progressive city of Hamilton, Ohio, whose municipal building is one of the most modern in the country.

The Frigidaire refrigeration equipment installed in this building includes two large central system air conditioners; and a large central water refrigeration system, providing fresh, cool water for three remote drinking fountains.

A 20-ton system furnishes air conditioning for the 4th floor utility offices, council chamber, city manager's offices and utility director's offices. A 15-ton system, located in the basement, supplies conditioned air to the police department and Municipal Court chambers.

This air conditioning system has been in operation for 12 years, and during that period only one minor servicing job has been necessary. So, whatever your next air conditioning problem is, why not call the Frigidaire Dealer, Distributor or Factory Branch that serves your area? Look for the name in the Yellow Pages of your phone book. See Frigidaire catalogs in Sweet's Files, or write Frigidaire Division of General Motors, Dayton 1, Ohio. In Canada, Leaside (Toronto 17), Ontario.

FRIGIDAIRE America's No.1 Line of Refrigeration and Air Conditioning Products

Refrigerators • Electric Ranges • Home Laundry Equipment
Food Freezers • Water Coolers • Electric Water Heaters • Air Conditioning
Electric Dehumidifier • Commercial Refrigeration Equipment

Frigidaire reserves the right to change specifications, or discontinue models, without notice.
NOW...a versatile building panel to add daylighting efficiency and decorative appearance to all types of construction

**STRUCTOGLAS**

Adaptable to unlimited uses for maximum lighting efficiency or unusual architectural effects, STRUCTOGLAS offers economy, durability, high level transmission of natural diffused light...plus attractive appearance.

This translucent, Fiberglas-reinforced building panel is extraordinarily strong, yet lightweight; low cost but long-lasting!

**Check these features:**
- Reduces daylighting costs up to 50% or more.
- Interchangeable with corrugated side wall and roof construction, or flat panels, in both existing and new construction.
- Easily installed.
- Maintenance-free.
- May be cut, sawed, nailed, bolted, drilled or punched.

**Wideley used for:**
- Skylights.
- Window walls.
- Office partitions (fixed or moveable).
- Shower and toilet partitions.
- Canopies and awnings.
- Interior wall panels.
- Decorative exterior facings and many others.

**Translucent colors:** Surf Green • Crystal Blue • Harbor Blue • Tangerine • Ivory • Lemon Yellow

**Opaque colors:** Tile Red • Sunflower Yellow • Emerald

Available in standard heavy and extra heavy corrugations to match metal and asbestos cement in standard sheet sizes up to 12 feet in length. Also available in flat stock.

See our catalog in Sweet's File, Architectural.

For full details, send this coupon today!

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**CIVIL DEFENSE**

"Rescue Street" Built in Ruins

One of the oddest construction jobs in U. S. history got started in Olney, Md. There, the Federal Civil Defense Administration began building a $200,000 street of ruins to train atom bomb rescue workers.

"Rescue Street" will consist of a group of buildings typical of most U. S. cities—a store, a theater, two-story dwellings, apartments and a five-story concrete office building—but all with walls blown out, girders and beams twisted, roofs caved in, and piles of debris blocking doorways.

Yet rigid engineering principles of stress, weight and use of materials governed design of the structures, says FCDA. Designs were developed from studies of high-explosive bombings in Great Britain and Germany and the atom bomb of Hiroshima and Nagasaki.

**Leaks, gas and shocks.** A two-story and basement wood frame house (see photo of model, below) will provide instruction in tunneling in earth and debris. In the basement, a simulated electric service will give trainees a mild shock if they brush an uncovered wire.

The two-story office-store-theater building (second model, below) will typify many city school buildings and meeting halls which are "not well suited to withstand" an atom bomb blast, says FCDA. Big danger: a shift of the walls will let the roof collapse, trapping occupants.

(Continued on page 22)

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**TWO-STORY OFFICES, STORE AND THEATER**

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Let's be frank. Success of any decor depends on taste, suitability and ability to meet the challenge of time! Varlar is versatile, available in range of types, patterns... "brings off" any decorating effect. And it is unchallenged in ability to "outsmart" time... with its amazing resistance to dirt and stain. Grease, ink, mercuriochrome, lipstick, crayon and countless more, simply soap-and-water disappear! Washes up to 25,000 times if need be! For homes, hotels, theatres, public buildings, Varlar is today's most functional wall! Goes on simply, easily as wallpaper; is beautiful indefinitely, cuts maintenance costs to the bone. Let us consult with you on your decorating problems.

Send FREE Testing Sample of VARLAR

Varlar Division, United Wallpaper, Inc., Dept. MB - 4, Merchandise Mart, Chicago 54
Taco has a proved record of helping

Factories • Office Buildings • Schools
Hospitals • Churches • Stores

Solve Their HEAT and HOT WATER PROBLEMS...

Provides hot water for wash fountains and showers for employees

Taco water heaters are supplying abundant low cost hot water in industrial plants throughout the United States. Our more than 30 years' experience in this field is a big help to those with hot water heating problems.

Heats entire building with heat formerly thrown away

A large industrial user of steam was dumping the condensate from their steam processing into a creek. Now, thanks to the 3 Taco heat exchangers on the right, they're reclaiming enough to heat the 220' x 560 building shown above. Taco products can perhaps do a similar service for you.

ARCHITECTS—ENGINEERS

WRITE FOR
simplified selection chart for sizing Taco water heaters under any conditions such as steam pressure, temperature rise and pressure drop.

A TRAINED TACO SALES ENGINEER IS AVAILABLE WHenever you need his help

Better Heating—Better with Taco

TACO HEATERS, Incorporated

137 South Street • Providence 3, R. I.

The two-story and basement row house, typical of U. S. urban building from 1890 to 1920, will require different rescue techniques because water will pour from simulated broken water mains, and leaks of harmless gas will cover other areas. FCDA experts think walls of most row homes would not shatter into bits under bombing, but would crack into big pieces, with side walls paneaking into horizontal layers held apart by furniture.

Needed: more data. Like the typical American town's structures, the buildings at Olney are far from ideal for bomb shelters. Up-to-date bomb protection for most U. S. citizens was still blocked by military refusal to reveal to architects the results of last year's Eniwetok A-bomb tests, where blast and radiation resistance of various types of structures was carefully measured. So far, only one fact had slipped out about Eniwetok. The Navy's Civil Engineer Corps Bulletin reported that the most successful structures tested were of precast concrete formed with thin-shell ribbed panels welded or bolted together in arches, domes or gables (see p. 151). Covered with 2' of earth, they become safe personnel shelters ½ mile from ground zero of a Japanese-type A-bomb.

DENVER SCHOOL of architecture to close for lack of funds

To the 120 students enrolled in Denver University's school of architecture and planning, Chancellor Albert C. Jacobs made a surprise announcement last month: the school would be closed at the end of the spring quarter in June because "the university cannot give to the school the financial support it deserves."

The school, founded in 1946, has a five-year course and was about to become accredited. The students who will be rooted out, many of them just short of graduation, heard Chancellor Jacobs' sad sermon on finances: "Independent education cannot in these days support a first-class educational or technical program without endowment funds or aid from the community. That help has not been forthcoming."
Announcing

TWO TYPES OF
PLYFORM
TO MEET EVERY USE NEED

NOW . . . the familiar PlyForm grade-trademark appears on both Interior-type and Exterior-type panels . . . making this time-tested Douglas fir plywood form panel MORE VERSATILE THAN EVER.
Exterior-type PlyForm, a new grade-trademark, replaces the old grade-name, Exterior Concrete Form; the EXT-DFPA continues to identify the Exterior-type panel. Bonded with completely waterproof phenolic resin adhesives, Exterior PlyForm should be specified where forms will be re-used until the wood itself is literally worn away, in excessively humid areas, or under other extreme use or storage conditions. Exterior PlyForm is identified by the new diamond-bar grade-trade-mark shown at left. Edges sealed with distinctive red sealer.

Specifications: Completely waterproof bond. Both faces of B veneer which is smooth and solid, but may contain small tight knots and neat circular repair plugs. Inner-ply construction (as in all Exterior for plywood) of C veneer contributes to strength and superiority of panel. Sanded both sides; edge-sealed with red and, unless otherwise specified, mill-oiled. Width 4', Length 8', Thickness: 5/8" and 7/8", 5-ply.

Interior-type PlyForm is now manufactured with improved glues to provide greater service than ever. These newly fortified glues are not waterproof, although highly moisture-resistant. Interior PlyForm panels will withstand several pourings of concrete ... up to 10 or 15 are not unusual, dependent upon care on the job and between pours. Interior PlyForm continues to be identified by the familiar diamond-shaped grade-trade-mark. Edges sealed with distinctive green sealer.

Specifications: Highly moisture-resistant fortified glues (not waterproof). Interior PlyForm is identical in face-ply characteristics and inner-ply construction to Exterior PlyForm. Sanded both sides; edge-sealed with green and, unless otherwise specified, mill-oiled. Width 4', Length 8'. Thicknesses: 1/2", 9/16", 5/8", 7/8", all 5-ply, and 15/32" 3-ply for form liner.

Cover Illustration: Artist's conception of Exterior plywood form sections used for foundation walls of Port Authority Bus Terminal, N.Y.C., for which consultant engineer Jacob Feld, N.Y.C., who designed 28'-high by 24'-long pre-assembled plywood sections, reports, "forms very successful. Six re-uses on walls, plus re-use on other parts of building, but forms could have been used indefinitely." Contractor: Foss, Halloran & Nair, Inc., Long Island City, N.Y.
PlyForm was specified on the new Carnation Company western headquarters building, Los Angeles, by Stiles Clements Associated Architects and Engineers for “smooth, fin-free concrete, ease of handling and overall job economy.” According to the architects, “Plywood offered the simplest, most direct medium for achieving the smooth concrete because it permits an even-textured monolithic surface to be cast simultaneously with the structure.” Smooth walls required a minimum of finishing before painting. Contractors on the job: William Simpson Construction Co., Los Angeles.

“We’ve found plywood forms to be the most economical for several reasons,” says C. J. Rollo, job superintendent for Brown & Root, Inc., contractors for the new Rice Institute Stadium, Houston. “Given proper care, they can be re-used again and again; they’re easier to handle, produce better looking concrete.” On the job, built-up Interior-type PlyForm seat forms were still in good condition after ten re-uses. An even greater number of re-uses was recorded for wall and fence forms. Architects: Floyd & Morgan and Milton McGinty, Houston, Texas.

“Plywood speeded form work all along the line,” says Earl Starbard, job superintendent of Woodworth & Co., contractors for all concrete work on the new mile-long Tacoma Narrows Bridge. On the job, contractors report, use of built-up plywood form sections “cut time and labor costs by 15%.” Plywood forms were used to form the reinforced concrete roadway and for all above ground concrete on the anchors, toll houses, bents and viaduct. Structure built by the Washington State Bridge Authority; Charles E. Andrew, chairman and principal engineer.

Plywood forms were called on to solve an unusually intricate concrete job in building the spectacular twin-spiral ramps at the University of Washington grid bowl addition. “Plywood forms offered the simplest and least expensive solution,” reports Elmer Strand, partner of Strand and Son, General Contractors, Seattle, Wash. “The panels can be re-used many times. They’re easy to fabricate into cost-cutting built-up form sections and are easily bent to form curved surfaces.” Architects: George W. Stoddard and Associates, Seattle, Washington.
Care On Job

Although plywood is far more rugged than other panel materials, maximum serviceability and re-use depends largely on the care it receives on the job.

After each use, nails should be pulled and panels cleaned with a wide blade, stiff broom or wire brush. Wipe clean with a burlap pad. After each use, panels should be re-oiled with a uniform coating of good form oil. (For plastic surfaced plywood, see individual manufacturers' directions on whether to oil.)

Attention should be given to corners and edges. All saw cuts and other workings should be “doped” with lead and oil, aluminum primer, shellac or similar material as the job progresses. Open cracks in joints should be pointed up or caulked with lead, putty or plaster of Paris filler.

Application

Plywood forms require proper support from studs or joists. Height, rate of pour and fluidity affect pressures and spacing of supports. Desired smoothness of finished wall also affects form specifications.

The following values are offered as guides to thicknesses of Douglas fir plywood for concrete form construction. Allowance is made for the decreased stiffness (about 20%) of the panel by wetting, the period of loading, and the increased stiffness developed when the panel is continuous over two or more spans. Values calculated on panels with face grain across the studs.

<table>
<thead>
<tr>
<th>PlyForm Thickness</th>
<th>Stud Spacing</th>
<th>Deflection Permissible</th>
<th>Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>\textfrac{3}{4}&quot;</td>
<td>1/270 of Span</td>
<td>880 lbs./sq. ft.</td>
<td></td>
</tr>
<tr>
<td>\textfrac{5}{8}&quot;</td>
<td>1/270 of Span</td>
<td>375 lbs./sq. ft.</td>
<td></td>
</tr>
<tr>
<td>\textfrac{7}{8}&quot;</td>
<td>1/270 of Span</td>
<td>1,330 lbs./sq. ft.</td>
<td></td>
</tr>
<tr>
<td>\textfrac{7}{8}&quot;</td>
<td>1/360 of Span</td>
<td>560 lbs./sq. ft.</td>
<td></td>
</tr>
<tr>
<td>\textfrac{7}{8}&quot;</td>
<td>1/360 of Span</td>
<td>660 lbs./sq. ft.</td>
<td></td>
</tr>
<tr>
<td>\textfrac{7}{8}&quot;</td>
<td>1/360 of Span</td>
<td>420 lbs./sq. ft.</td>
<td></td>
</tr>
</tbody>
</table>

Stripping, Storing

Large, rigid plywood form panels strip quickly, easily. The resilience of the wood distributes pull over a large area to minimize any danger of spalling. If wedging is required, use only wood wedges, lightly rapped to break the adhesion. Panels should not be allowed to drop from ceilings or walls, but should be removed using scaffolding or platforms.

After stripping, panels should be cleaned and re-oiled (see directions at left). If form sections are completely dismantled, panels should be stacked evenly on a dry and level platform, protected from rain, sun, and traffic abuse. Long-time storage should be indoors. Interior PlyForm panels should not be stored under tarpaulins.

Yours for $1

New Keely PlyForm calculator gives construction data for plywood forms, based on hourly rate of pour. Complete with leaflet, "Design Assumptions for new Keely Calculator." Send $1.00 to Douglas Fir Plywood Association, Tacoma 2, Wash.
Now MATICO offers a SUPERIOR, NEW PLASTIC FLOORING for on, above or below grade

- Impervious to petroleum solvents, oils, greases, turpentine, alkalis and household acids.
- Extremely resilient. Good sound absorption.
- Smooth, non-porous surface sheds dirt — wipes clean with damp mop.
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- Easy to install — no special adhesives needed.
- Available in 9" x 9" standard gauge and ½" tiles.

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THE ARISTOCRAT OF RESILIENT FLOORING

PLASTIC—ASBESTOS . . . NO FELT BACKING

New MATICO Aristoflex Tile Flooring is plastic-asbestos through and through. It's extremely tough, very flexible. Vivid, sparkling colors and marbleization go clear through each tile. Long wearability and enduring beauty are assured.

Aristoflex may be laid direct on concrete . . . over terrazzo or ceramic . . . on wood over 15-pound saturated felt . . . and over magnesite (above grade).

Installation is unusually easy, and less costly. No special cements are required, ordinary asphalt tile adhesive does the job. It lays in tightly, immediately, due to square corners and clean edges.

Write for free Aristoflex samples and specification data.
Dept. 64

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Member Asphalt Tile Institute
Joliet, Ill. Long Beach, Calif. Newburgh, N.Y.
World's largest producer of asphalt tile
THE PERMANENCE afforded by a Securitee System® installation of acoustical tile is one important reason for its outstanding superiority.

Finest quality materials, high manufacturing standards and careful load testing of each component part assures users that a Securitee System installation will last the life of the building under normal conditions.

Easy access to piping or wiring helps to quickly localize any between wall, or ceiling, trouble. Flush lighting fixtures may be installed inexpensively and without the usual construction problems.

Specify and insist on Securitee—the outstanding suspension system on the market.

See Sweet's Architectural File or write direct for complete technical data.

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COREX® is a special composition, molded over a core of hardwood fibrous chips, under tons of pressure, into a homogeneous unit whose toughness and resilience defies fracture, cracking, chipping, warping or deterioration.

Rigid laboratory control guarantees uniformity of the physical qualities which make COREX ideal for schools, hospitals, factories and all sorts of industrial and institutional installations.

CHURCH PLASTIC WALL TILE

Individual tiles of gleaming plastic in a wide range of colors, now available. Its light weight and ease of application make it particularly suitable for remodeling or new industrial construction.

Write for brochure and sample tiles.

Heavy brass insert imbedded continuously across back and locked into molded core, absorbs any stress, strain or shock.
In the expertly planned Lucas County Library at Maumee, Ohio, floors of PLASCOR, installed by Bernard's, Inc., Toledo, are functional and decorative.

Where quiet is essential to concentrated and effective study or relaxed reading, PLASCOR floors underscore the silence motif. Scientifically created of Tygon vinyl plastic with resin-impregnated cork, these tiles are "sound mufflers", and their extra resiliency adds to comfort afoot. Yet PLASCOR is almost completely free of "indentation" characteristics.

Here, too, architects must specify flooring that will take wear in stride . . . stand up under the daily passage of busy, careless feet. Careful comparison reveals to the architect the fact that no other modern floor tiling can give ALL the advantages of PLASCOR. Neither alkalies, acids, grease nor oils affect it. It offers the quaintness of cork plus versatility of color selection and unmatched wearing quality. It is truly flexible and easy to maintain . . . and it is less expensive than you might think. No wonder more and more architects are specifying PLASCOR for libraries, institutions, churches, public-meeting places and private homes.

Easily installed on grade or over radiant heating, PLASCOR is available in 1/4-in. thick squares of 8½", 11", 17" and 34" size.

U. S. STONeware
Akron 9, Ohio

COMFORT, foot, walking or standing, is yours with resilient PLASCOR floors.

WEARABILITY tests prove the endurance of PLASCOR floors under demanding conditions.

SLIP-RESISTANT, wet or dry, PLASCOR removes the skid hazard of many average tile floorings.

ATTRACTIVE colors in marble effect, may be combined with harmonizing feature strips and cove base.

SEND FOR FREE SAMPLES AND INFORMATION TO KEEP YOUR FILES UP TO DATE FOR YOUR CLIENTS

LETTERS

NO MORE RIVETING?

Sirs:

I have read your article "No More Riveting?" (AF, Mar. '52) with interest . . .

At present, due to the inability to be sure that high tension bolts have been properly tightened, engineers with field experience and familiar with the rather crude methods yet developed to test these bolts feel that they cannot be sure of the stability or strength of the connections. With proper testing this method of bolting connections will be very satisfactory. But, until I am sure that they can be properly tested, I will be reluctant to use them.

In the course of my experience, I have seen so many loose rivets after years of use—rivets which I know were very tight when placed—that I would be reluctant to believe that after a period of years the deformation which could take place in a tension bolt would not eventually loosen it . . .

We are very sure, through inspection processes, of every weld that goes into a structure. So I feel that welding is absolutely safe. I would feel the same about the tension bolts if all bolts could be satisfactorily tested for proper tension . . .

VAN RUSELLAER P. SASS, Engineer
Baltimore, Md.

Sirs:

We have not completed any study of the costs of replacing riveting by high-tensile bolting. The steel frame of the Buick factory in Flint, Mich. is to be riveted. The Johns Hopkins Hospital at Baltimore and the Mayo Hospital at Rochester, Minn., where we are currently erecting extensions, will make use of high-tensile bolting. In other words, there is no set policy, and determination of methods (Continued on page 80)

V., W., F. & S.'s WALL

Detailed in the Dec. '51 issue (but unfortunately without credit) and shown above, the 1½ mil long serpentine wall enclosing Ford's proving grounds at Dearborn, Mich. was designed by architects Voorhees, Walker, Foley & Smith.—En.
For every industrial use . . .

the new LONG-SPAN MULTIPLE

YOUR best bet for industrial plant expansion! That's the new, all-steel Long-Span Multiple, the building designed and engineered for maximum industrial efficiency.

The Long-Span Multiple gives an amount of usable, unobstructed interior space hitherto unavailable with mass-produced, prefabricated buildings. Its unique column arrangement provides ample room for modern industrial equipment, complete palletization, and production lines. Its arch roof gives unusual height advantages for low-cost installation of boilers, presses, other tall equipment.

The Long-Span Multiple is easily and economically insulated, sky-lighted, ventilated. Size is adaptable to any lot or use requirement. Ribs and trusses are of N-A-X HIGH TENSILE steel for long life, strength and economy. It goes up in weeks instead of months.

Long-Span Multiples are available now to solve your individual expansion problem. Write, wire or phone for complete information on this latest addition to the famous Quonset® line.
Hang those BIG SHEETS* with Cello-Clip to save their lives!

A STUBBORN rolled-up drawing (or other large sheet) can and usually does develop more obstinate, contrary, infuriating tricks than an octopus with a mule's disposition. It won't lie flat; it curls and crimps — and often gets itself torn, wrinkled, dirt-smudged, and dog-eared. NOT good for valuable papers!

FLAT-DRAWER STORAGE is little if any better. You handle many sheets to find one. Removal or replacement is awkward, causes damage and smudging, wrinkling and creasing.

ONLY ONE SYSTEM provides assured safety for valuable large sheets—Globe-Wernicke Cello-Clip. This system suspends each sheet (or group of sheets) vertically — so that each sheet or group can be removed or replaced individually, without disturbing other sheets.

Every sheet stays agreeably Flat! — Clean! — Intact!

READY INDEX fits any requirement, provides finding INSTANTLY! Time-saving — work saving — top efficiency!

WIDELY USED — Cello-Clip wins the warm endorsement of — Architects Sales Departments
Engineers Advertising Agencies
Real Estate offices Art Studios
Public Utilities Lithographers
Government offices Printers
Drafting rooms Photo-Printers . . . because Cello-Clip provides complete PROTECTION . . . and complete ACCESSIBILITY; costs LESS — stores MORE!

ASK FOR THE FACTS — use the convenient check list request . . . More than 4000 other ways to better business originate with Globe-Wernicke; are sold and serviced by dependable G/W dealers, listed in classified 'phone books under "Office Equipment."

CHECK this LIST for wanted information—promptly furnished:
- Special BIG Papers System
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- Modern Filing Methods
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Check above, attach to your letterhead — and MAIL — TODAY!
Janitrol GAS-FIRED UNIT HEATERS

Eliminates need of expensive central-heating system and labor costs of operating and maintenance men.

Minimum of installation space required and no fuel to order and store.

Flexible operation, heat is used only when and where it is needed.

Low operating costs resulting from the efficient use of clean gas heat, automatically controlled.

Engineering layout service assures sound installation planning to meet individual heating requirements.

Heating can be combined with ventilating or summer air-conditioning distribution systems.

18 sizes and types provide capacities ranging from 50,000 to 450,000 Btu/hr. Features include individual ribbon burners converting heat to separate heat exchangers to provide greater efficiency in less space. Blower equipped units are used to quietly circulate warm air against higher static resistance, permitting the use of ducts.

No fan or motor is required for these units as installations are made to temper ventilating air or to supply heat through summer air-conditioning duct work where air is circulated by a blower system. 5 sizes provide capacities from 85,000 to 225,000 Btu/hr.

Sectional construction of units permits heating capacities up to 1,500,000 Btu/hr. Sections can be equipped with directional diffuser outlets or to connected duct work. Units widely used for heating large areas such as airplane hangars, warehouses and plants handling large assemblies.

SURFACE COMBUSTION CORPORATION • TOLEDO, OHIO
On a NEW USE OF METAL TRIM

Standard Knapp trim has been developed so that chalkboards and cork bulletin boards can easily be installed on any finished surface. No special wall construction is needed, permitting expansion of classroom area without expensive remodeling. Easy to install, neat and trim in appearance, Knapp Standard trim No. 28 and No. 29 are easily adapted to any wall condition.

Learn more about this and other new trim methods by reading "Trim Talks" a regular bulletin sent to you free. Write and ask to be placed on the mailing list.

Write to Dept. TMB-4512

CUT COSTS

Here's a Quick Tip On a

NEW USE OF METAL TRIM

CORROSION COSTS YOU MORE THAN WROUGHT IRON

You'll want to see this sound film on Byers Snow Melting Systems. Our folder, "A Winter Wonder," tells you what the movie covers and how to apply for a showing. Send for your copy now. Write A. M. Byers Company, Clark Building, Pittsburgh 22, Pennsylvania.

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You'll want to see this sound film on Byers Snow Melting Systems. Our folder, "A Winter Wonder," tells you what the movie covers and how to apply for a showing. Send for your copy now. Write A. M. Byers Company, Clark Building, Pittsburgh 22, Pennsylvania.

LETTERS

will depend upon the situation affecting any particular job. . . .

J. CARLISLE MACDONALD
Assistant to Chairman
United States Steel Corp.
New York, N. Y.

Sirs:

... I recognize that considerable research has gone into the preparation of this article and that it contains much information that I am glad to see publicized. In some places, however, it treads on thin ice and advances conclusions prematurely. . . .

JONATHAN JONES, Chief Engineer
Bethlehem Steel Co., Inc.
Bethlehem, Pa.

Sirs:

... On the jobs erected in this territory we have encountered no trouble in the use of bolts. As a matter of fact, on a riveting job there are many places that give trouble where there is no room for backing up the rivets. In such cases bolts have been used and if there are any limitations on either type of construction, it would be on riveting rather than bolting. . . .

W. H. HART, District Engineer
American Institute of
Steel Construction, Inc.
Milwaukee, Wis.

WELDING AND WEATHER

Sirs:

Your article "Welded Hospital" (AF, Feb. '52) stated that the structural steel was erected in bitterly cold weather. The welders will certainly agree with this statement. . . . The bulk of the welding was performed at temperatures between zero and 15°. . . .

This cold was not entirely detrimental, however. At these temperatures the steel beams were shortened their maximum amount, thus aiding in seating the erection clips. Also, with all welds made on contracted steel, any change in the steel dimensions caused by temperature, thereafter, was an elongation. This expansion placed the welds under compression. The welds could not be placed under tension by temperature changes.

Weather also subjected the steel framework to a crucial test. On July 20, 1951, the most severe wind storm in recorded history swept this area. Wind velocities up to 135 mi. an hour were recorded at the airport from this building. At that time the entire steel framework was erected and welded, but only the first two floors had been concreted. Brickwork was completed on the first floor only. The scaffold for the brickwork was in place on all sides of the structure supported by cables from outriggers placed above the roof. These cables were played out practically their entire length. The wind whipped these scaffolds as you would shake a rug, for a period of more than

(Continued on page 84)
In building after building, Johnson is called upon to furnish and install dependable automatic temperature and humidity control for modern air conditioning systems. No matter what the extent of the problems involved, the chances are that they will be turned over to the nation-wide Johnson organization.

In Pittsburgh's newest skyscraper, 1,650 year-around air conditioning units provide all-weather comfort in each exterior room. A Johnson T-271 Heating-Cooling Thermostat is located in one of the units in each room, with its temperature bulb mounted close behind the recirculating air grille to respond quickly to the average temperature of the air entering the units. Thus, the Johnson V-152 valve, on the hot and cold water supply to the coil in each unit, is operated to determine automatically the heating or cooling effect to be applied.

The interior areas in the building are served by 51 central-type air conditioning systems, and 105 Johnson T-315 Submaster Room Thermostats control Johnson V-105 coil valves on the steam supply to booster heaters.

In addition to the Individual Room control, there is comprehensive Johnson Master Control, "behind the scenes", to regulate temperatures and humidities for the 10 systems which supply primary air to the units, as well as the conditioned air delivered by the 51 central systems which serve the booster heaters in the interior sections.

Yes! THE CHANCES ARE that a Johnson engineer from a nearby branch office has the answer to complex temperature control problems such as those encountered at 525 William Penn Place. He is equally conversant with smaller problems, too. A talk with him entails no obligation. Ask him to call on you, any time. JOHNSON SERVICE COMPANY, Milwaukee 2, Wisconsin. Direct Branch Offices in Principal Cities.
NATCO STRUCTURAL CLAY TILE

for Exterior and Interior Walls in the Modern Factory

Such exterior walls, when lined with Natco-Ceramic Glazed Vitritile, also non-critical, represent the best in masonry construction. These interior walls and partitions of Natco Vitritile set up sturdy and strong are attractive and cheerful, and require little or no maintenance other than an occasional cleaning with soap and water. The finishes and colors available with Natco Ceramic Glazed Vitritile have been scientifically selected and developed to provide a permanent structural wall and a permanent attractive functional finish in one operation.

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Exterior walls of non-critical Natco Manganese Spot Dri-Speedwall Tile or Natco Tex Dri-Wall Tile are strong and enduring, are load-bearing, architecturally attractive and resist moisture penetration. In addition, they are fire, termite and vermin proof, cannot rot or decay, are free from shrinking and cracking and require no painting or repairs.


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"The Quality Line Since 1889"
The photo above is a partial view of the Koroseal Tile Supreme installation in the counter and kitchen areas of the J. C. Penney Co. cafeteria in New York.

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Sloane Koroseal Tile Supreme eliminates floor disintegration because it is totally unaffected by grease, oil, fat, acid, alkalis and other substances.

Shown by every test to be the longest wearing resilient floor tile ever made, its vinyl plastic composition insures indefinite service in any area where food is processed, cooked, or served.

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For an independent heat source when plant expansion exceeds steam capacity, or for a compact, efficient heating system in new construction where time and costs are vital factors — the Mueller Climatrol unit heater line supplies the perfect answer!

Here are a few of the many savings they offer:

- Installation Cost is Low — shipped pre-wired, completely assembled; just hang, connect to gas and power lines and vent. No special chimney needed.
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When you think of space-heating think of Mueller Climatrol. Capacities to fit any job you have. Write for complete information . . . L. J. Mueller Furnace Co., 2020 W. Oklahoma Avenue, Milwaukee 15, Wis.

LETTERS

two hours. The outriggers were twisted in all directions and the scaffold planking was carried hundreds of feet from the building. In spite of this extreme racking and twisting the framework remained plumb and not a weld was broken.

All welds were re-examined prior to the placing of concrete forms and not a cracked weld was found in the entire structure.

This is the first all-welded tier type building erected in this north central area and we all feel proud of the results. A better building was produced at a saving in both steel and labor costs.

COL. R. A. PHelps
Fort Snelling
St. Paul, Minn.

Representing the government on this VA hospital project, Col. Phelps was in charge of field construction...Eo.

PLEASANT BUT NOT REVOLUTIONARY

Sirs:

By your monthly publication of one or more hospital projects, you are performing a much needed service to architects and all others who read your journal. I am sure I express the sentiments of your readers in thanking you for this service. However, in all humility, we must constantly look to the improvement of all that we do...

The Anderson Hospital in Houston (AF, Feb., '52) is pleasant to behold and is well planned. I only wish that the planners could have avoided interrupting the various laboratory and research floors by the interposition of the operating department at the fourth floor. If the research wing perpendicular to the service wing were handled in some other way, a comparatively narrow court would have been avoided and a better outlook secured for the patients in the nursing wing which the research wing masks to a considerable extent. I also think it is a mistake to block corridor ends by stairs. Not only does this rob the corridor of light, air and view, but in case of future expansion it would be necessary to tear down those dearly bought stairs, only to rebuild them elsewhere.

As to your method of presentation I would like to see more plans in preference to photographs, and less extravagant claims. ... It is not necessary to claim that every other hospital you present is revolutionary... Isadore Rosenfeld
Architect & Hospital Consultant
New York, N. Y.

DOES RICH'S TELL MACY'S?

Sirs:

I read with great interest the article on the Rich's Department Store addition (AF, Feb. '52), because in many respects Rich's solution was directly contrary to our solution for Macy's Kansas City Store.

In many respects, the project for Rich's is completely successful, particularly the light-
ness and general clean effect of the exterior. Likewise, the interior design was competently handled. I believe, however, the disadvantages of the open front are quite obvious, as you have noted in your article. Our solution which resulted in a windowless building for Macy's was based on the clients' requirements that we have a peripheral stock room system which put reserve stock as close as possible to the selling departments. This, of course, placed the stock against the periphery or exterior walls of the building and therefore made windows a nuisance. I believe the requirements established by Rich's must have differed, therefore making possible the window wall on facade of the building.

Although your article didn't indicate an interior fixture arrangement, it has been our experience that there are certain limitations in floor arrangement flexibility due to a window wall. Our client, as well as ourselves, was (Continued on page 88)
The 525 William Penn Place Building, occupied by Mellon Bank and subsidiaries of U. S. Steel Corporation, is typical of the changes taking place in Pittsburgh today.

---

It's digging deep, building high, expanding fast

Giant skyscrapers rising in the heart of the Golden Triangle... blighted areas being reclaimed for modern housing projects... new and old industries spending upwards of a billion dollars for new or modernized plants.

That's progressive Pittsburgh today!

If you've thought of Pittsburgh merely as a busy "workshop"—take a new look! Today it's one of America's boldest and most vigorous industrial cities.

In this home of many of the "first names" of industry, you'll find a resurgence of civic spirit unmatched in America today. Add to this Pittsburgh's natural advantages of location and raw materials, its importance as a market for your products... and you may well decide that here is a logical place for your new plant or office.

IN COMMERCIAL BANKING... the services of Mellon National Bank and Trust Company have played an important part in the development and growth of many industries. Building construction, steel, aluminum, glass, oil, transportation, electric power, gas, abrasives, coal and coke production... are some of the many industries that have benefited by these commercial banking services. Perhaps this broad experience, plus Mellon Bank's large loaning facilities, can be of special value to your business.
Whether the job calls for a single packaged air conditioning unit or a central plant... a packaged water chiller or a heat pump — you can count on Typhoon equipment to supply your needs. And Typhoon's quality engineering — backed by over 40 years of experience — is your guarantee of trouble-free performance.

Satisfied Typhoon users include famous companies like RCA, American Broadcasting Company, Warner Brothers and Whelan Drug Stores. They've found Typhoon equipment tops in economical operation... tops in cooling efficiency. You will, too.
Likewise concerned with the unbalanced light intensity which would be created by a window wall, the maintenance and window washing costs, the heat loss and the additional air conditioning tonnage which was a big factor on our particular project. In the case of the Macy project, and its requirements, we felt that the windowless building offered greater advantages than a building with windows. I personally feel that the Macy solution, as well as the Rich solution, although at opposite poles to each other, each possibly satisfy the clients' requirements and both can be considered successful. ... I doubt whether Rich's architects, Stevens & Wilkinson, would agree that the window wall solution is a universal solution for all department stores. It would be interesting to conjecture which solution each of us would have obtained had Macy's been their client and Rich's our client. I suspect that the basic result would have differed little from that which we each obtained with our present architect-client relationship.

Much of the success of a solution depends on conditions that are specific to each job and in view of these conditions, how well the architect solved the problem. For this reason, I feel that Stevens & Wilkinson, architects and engineers, and Eleanor LeMaire, designer, have produced an exceedingly handsome piece of architecture on both the exterior and interior. I seriously doubt that the Rich's solution "emphatically contradicts" the Macy solution, but rather that they are two entirely different problems which we logically solved in two entirely different yet satisfactory ways...

As usual, this presentation continues the high standards of reporting set by your organization. The layouts represent good taste in selection and arrangement...

RALPH E. MYERS
Kivett & Myers, Architects
Kansas City, Mo.

Sirs:
Regarding the new "Store For Men" built by Rich's, in Atlanta ..., we have heard glowing reports of this article from many members of the men's wear trade.

ROBERT SIMON
Ben Simon's Quality Apparel
Lincoln, Neb.

WHY HIGH HOUSING?

Sirs:
I dispute "The Case for the High Apartment" presented in your January issue.

The economics of industry, demands of defense and optimum living requirements are operating forces toward decentralization. But as long as society licenses the real estate investor to increase population densities at the expense of human well-being, the now apparent disadvantages of high urban concentration will be maintained. Aside from the...
comfort and sound construction, from the large Knoll international collection. Recommended for use in dormitories, hotels, any contemporary interior. Foam rubber seat and back, available in the new Knoll handwoven or utility weaves.

FRANCO ALBINI LOUNGE CHAIR of maximum comfort and sound construction, from the large Knoll international collection. Recommended for use in dormitories, hotels, any contemporary interior. Foam rubber seat and back, available in the new Knoll handwoven or utility weaves.

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for Architects and Engineers

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Distribution is being limited to those directly concerned with electrical planning. If you need the material and have not already received a copy, please contact your Westinghouse representative.

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The kind of structure that builds an architect's reputation...

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You may know that a loading building is like a firing line—no time out, has to keep going in all weathers. Can't halt for rain...fire...rot...rust...or repair.

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Today this modern, versatile siding and roofing is being used for industrial and commercial buildings, stores, theaters, and even homes! Write us for information about particular applications...we'll rush a reply with complete data.

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America's first maker of Asbestos-Cement Shingles


Architects: Stone & Pitts, Beaumont, Texas
How sun's heat and glare is kept out of University of Minnesota classrooms

When Ford Hall, the University of Minnesota's Social Science building on the Minneapolis campus, was first occupied, instructors and students complained of the excessive heat and blinding glare from the windows. The 117 windows on the south and west sides let in a tremendous amount of glare and heat whenever the sun shone on them—which was a good part of the day.

The Maintenance Department soon had Ingersoll KoolShade Sunscreens installed on all 117 windows. Now the rooms are comfortable inside even when the sun is blistering hot outside. Also, the bright highlights at the windows are reduced and only a cool, glareless light is admitted through the KoolShade louvers.

KoolShade Sunscreen blocks out as much as 87% of the sun's heat rays ... 100 square feet of KoolShade on sun-exposed glazed areas is equal to one ton of air conditioning (12,000 B.T.U.'s).

KoolShade Sunscreen with thin bronze louvers set at a 17° angle is scientifically designed to admit glareless light; eliminating bright glare and deep shadows that cause so much eye-strain.

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**TAKE A QUICK LOOK**

at AZROCK’s New Color Line for '52! Spread out the colors and compare them with any other asphalt tile color line. See how color for color AZROCK is brighter, cleaner, more attractive. These colors will help you satisfy your clients more completely.

**TAKE A CRITICAL LOOK**

— like your clients do. AZROCK colors are designed to give the architect a completely balanced line of colors so that he can design interiors of greater architectural perfection.

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at the physical characteristics of these new color samples. Note the smooth surface, the attractive marbleizing, and the sharp, precise dimensions. They all contribute to the AZROCK reputation for performance!

*Write today for your copy of the 1952 Azrock Color Chart.*

---

**LETTERS**

important social consequences, a profit system which requires extensive land use overloads facilities to the point that adequate transportation and parking, health and public services require financing in a measure far beyond municipal ability.

As a means of control, the limiting of densities is the most important single step which can be taken to benefit the community. Why perpetuate excessive density through the construction of high housing, which in reality is merely our monument to a poor urban environment?

*Robert L. Jones, Architect Chicago, Ill.*

**AUSTRALIAN ROOF BUBBLES**

*Sirs:*

Your December articles on built-up roofs are very interesting to me, having been connected with the manufacture of bituminous roofing and felts and especially with the laying in hot bitumen of built-up roofing specifications.

Your article on preventing bubbles mentions that the felts are stuck down to the insulation with hot bitumen. I have found that the membrane of felts laid loose to either the concrete slab or the insulation will save blistering. If the concrete slab should crack, the surface roofing will not be affected.

*Harley F. Williams Troy Roofing & Flooring Pty. Ltd. Alexandria, Australia*

**GULF OIL BUILDING**

*Sirs:*

I compliment you on the very excellent coverage on the Gulf Oil Building in Atlanta (AF, Feb. '52).

**ARCHITECTURAL FORUM** should also be complimented on the "professional" approach in its reporting.

*I. M. Pei, Architect Webb & Knapp, Inc. New York, N. Y.*

In the presentation of the Gulf Oil Building, the editors regretfully failed to credit Stevens & Wilkinson as associate architects among whose important contributions to the design of the building was their thoughtful landscaping work.—Ed.

**READERS DIGEST'S FURNITURE**

*Sirs:*

Your article on the Readers Digest Building in Tokyo (AF, Mar. '52) mentioned that the furniture was designed by the architects but failed to note that Henry Robert Kann was in charge of this phase of the work.

Also, the uncredited photographs were taken by Fumio Murasawa, Tokyo.

*L. L. Rado Raymond & Rado, Architects New York, N. Y.*
ONE of the most outstanding characteristics of Brixment is its plasticity. Its working qualities are comparable to those of lime putty. Because of this unusual plasticity, a bag of Brixment will carry three full cubic feet of sand, and still make good workable mortar.

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Steel windows have the strength and rigidity that no other windows can match. And now Fenestra has even eliminated maintenance painting! Insist on Fenestra Super Hot-Dip Galvanized Steel Windows.

Here's why they are called Super Galvanized: Fenestra has developed a Hot-Dip Galvanizing system designed specifically for steel windows and built a special plant around it. It is the only one of its kind in America.

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So add Super Hot-Dip Galvanizing to your present list of Fenestra advantages... such as integral ventilator butts that increase window strength, precision machining of window bars for perfectly uniform window size, automatic assembly of ventilators for perfect permanent fit, continuous double contact for weather-tightness all around vent openings, rigid interlocking muntin joints.

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   Do you have a factory problem that could be solved by the use of chilled water in one of the processes? Servel has the unit to remedy it! What do you want to air condition...a factory space, a store, an office? Servel has the unit or combination of units to provide economical air conditioning how and where you specify it! You may have cooling only...a year 'round combination of heating and cooling...or combination units for vibration-free multiple floor air conditioning.

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The base of this panelboard interior is made of Plastisol...the first time this amazing plastic material has been used for this purpose.

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277-volt Wiring System
By using 480Y/277-volt distribution for lighting, you get the copper-saving advantages of higher-voltage, lower-current distribution. This voltage is provided by the standard 480-volt, 3-phase, 4-wire system, which offers a line-to-ground voltage of 277. Standard fluorescent fixtures with 280-volt ballasts can be connected directly into this system with no extra preparation.

G-E Remote-Control Wiring
Master selector switch RMS-2 and other components of the G-E remote-control wiring system offer convenient switching of as many as nine circuits, save copper by using small 24-volt control wires. Remote-control relay RR-2 mounts in knockout box or ganged in pull box near lighting fixture—switches can be installed at practically any convenient location.

Individual switches and master selector switches offer the advantages of multipoint switching—in spite of today's tight copper supply.


Voltage between line and ground is 277 in standard 480-volt, 3-phase, 4-wire system.

MASTER SELECTION SWITCH permits flexible control of large areas of lighting from central locations—can be used for watchmen's circuits and standard lighting control.

ADDED COPPER SAVINGS are accomplished by this small, lightweight control wire used with the G-E remote-control wiring system. Wires can be laid up on partitions, can be rerouted easily at any time.

REMOTE-CONTROL RELAY operates on 24 volts—cuts costs and copper required to run load lines down to switches. Rated 1/4 hp; 15 amp; 125 volts; 5 amp, 277 volts. No need for derating with fluorescent loads.

You can put your confidence in—

GENERAL ELECTRIC

THE MAGAZINE OF BUILDING
UN Trusteeship Council Chamber designed by Denmark's Finn Juhl is typical of the friendly interiors in the newly completed Conference Building. View here is from public galleries across press gallery to delegates' floor. Brightly colored boxes set into wood trusses are lighting and air conditioning units. For details of rest of building, turn page.

Photo: Ezra Stoller-Picsie
UN completes the link

Conference Building cleans up Manhattan's water front,
gives Secretariat a base to stand on

Of the three major structures that make up the UN headquarters group on
New York's East River bank, the 400' long, five-story-high Conference
Building completed last month is both the most complex and the least visible.

*It is complex* because it has three major (and sometimes conflicting) functions: It is the link between the towering Secretariat and the sway­
backed General Assembly Building; it is the community center for UN em­
ployees who use its lounges, terraces, restaurants, bars and other facilities; it is, finally, the building in which different UN councils and committees
meet in conference.

*It is half hidden* by the Secretariat tower and will be even more invisible
when the General Assembly Building is completed late this fall. Yet, though it seems but a hyphen between Secretariat and General Assembly when seen from the UN's Manhattan approach, the Conference Building is an important architectural element when seen from the East River (above): then it becomes the flat base upon which the 39-story Secretariat can rest its giant bulk, the visual “underpinning” needed to hold up such a mass.

Most visitors to the UN, however, will remember the Conference Building for two reasons: first, because it contains some of the most pleasant interiors to be found in a public building; and, secondly, because its sweeping terraces have set a spectacular example of how to clean up Manhattan's ragged water front (see below).

For more than ¾ mi. Manhattan's East River front is now faced with a sweeping parapet of steel painted with aluminum. This clean cantilever juts out over Franklin D. Roosevelt Drive, is so designed as to give motorists in both lanes unimpeded view of river. Third lane services UN group.
Ease of circulation had top priority in the design of the Conference wing. Three groups of people use the building and every effort was made to keep them out of each other’s way: First are the delegates, most of whom will enter the building from the Secretariat; next is the general public, whose main access will be by way of the north lobby of the General Assembly Building when that is completed this fall; last are the press-radio-TV-movie personnel, whose elaborate facilities include press galleries and viewing slots on both sides of each meeting hall. To keep these three groups separate and give each direct access to its section of each hall, UN’s architects developed an elaborate split-level system which brings each group in on separate levels.

The result is a building sandwich four slices high on its west side (disregarding basements and penthouse), two slices high in the middle, and five slices high along parts of the river front between the meeting halls proper. The four slices are delegates’ and public concourses; the two slices are the council and conference halls; the five slices are translators’ booths and press, radio, TV and movie personnel galleries. The plans and sections on these pages will help to explain how the split-level system works.
UN CONFERENCE BUILDING

Three council chambers (plan below) are directly above three conference rooms (section above). Conference Building is link between Secretariat (below) and General Assembly Building (right).

THIRD FLOOR

SECTION X.X

Typical conference room by UN architects, Abel Sorensen in charge of interiors.

Trusteeship Council Chamber by Finn Juhl.

Economic and Social Council Chamber by Sven Markelius.
In both council chambers and conference rooms the wall surfaces were covered with vertical battens widely spaced and backed with sound-absorbing material. Chief interior design problem was to play down horizontal viewing slots in side walls. Above: Finn Juhl’s Trusteeship Council Chamber with its special, articulated brass-tipped chairs. Below, right: Sven Markelius’ Economic and Social Council Chamber. Note the abstract white-gray-black patterns painted on the exposed ducts. Markelius painted sides of ducts and ceiling black, suspended his lights low so as to throw ceiling patterns into semidarkness. Hand-woven curtain for glass wall in Markelius’ chamber is yet to come. Its colorful design (with huge butterfly wings) is result of Swedish design competition.
**Interior design:** More than anything else, the Conference Building was an interior design problem. Recognizing this, UN's director of planning, Wallace K. Harrison, called in Swedish architect Sven Markelius, Danish architect Finn Juhl and Norwegian architect Arnstein Arneberg to design the chambers for the Economic and Social Council, Trusteeship Council and Security Council, respectively. The result is three interesting variations on the “humanist” design idiom now popular in the Scandinavian countries.

Sven Markelius' design for the Economic and Social Council (see cover and lower photo, opposite) envisages the chamber as a vast and roughly built cavern in which the brightly lit delegates' area is picked out as an island of refinement and elegance. To create this contrast, Markelius suspended a perforated ceiling plane above the delegates' horseshoe, left the rest of the ceiling structure with its maze of ducts and pipes frankly exposed to the eye. A brilliantly colored curtain, hand-woven in Sweden and designed as a result of local competition, will soon be installed across glass wall to the east of the chamber.

Finn Juhl's Trusteeship Council Chamber (opposite) is, by contrast, very playful. Its spidery wood trusses hold boxed lighting and air conditioning units, and big wall lights pick out their brightly colored sides. Where the Markelius chamber has a very large scale in its major elements, Juhl's room seems almost domestic. Architect Arneberg's Security Council Chamber does not measure up to the other two, is therefore not illustrated.

Left: typical conference room with dais along side wall, viewing slots arranged as in council chambers. Press gallery is nearest delegates' floor, public galleries are farther back. All gallery seats are equipped with six-position simultaneous interpretation earphones.
Delegates' dining room is in the penthouse on top of the Conference Building, has fine views of East River across spacious roof terrace. Light, colorful woven screens divide dining room into intimate areas.

What do the critics say? They have only two objections: First, some feel the Conference Building is rather prosaic and uninspired. The answer is that it is merely a hyphen, was never meant to attract special attention. A more serious criticism concerns the interiors: granting the Scandinavian-designed council chambers are (by and large) handsome and friendly, was there any good reason for limiting their design to the esthetic represented by men like Markelius and Juhl (who like to work in an almost domestic, rather than monumental, scale)? The answer is yes—first, because Norway, Sweden and Denmark donated the interiors to the UN on condition that the money be spent in their own countries; and secondly, because it occurred to some of the designers involved that the council chambers and conference rooms should be treated on an intimate scale to encourage face-to-face discussion; and that the General Assembly hall would present a striking contrast and a monumental climax. It seems only fair, therefore, to await the completion this fall of the General Assembly Building (and, with it, of the UN group) before rendering a final verdict.
Few people will ever see the Conference Building's best feature: its ¾-mi. long, aluminum-painted steel parapet along the East River. It is a spectacular example of what can be done to clean up Manhattan's chaotic waterfront.
THE PHILADELPHIA

The eldest, third largest and quietest
metropolis in the U. S., Philadelphia, is attacking the problem of blight in a startling new way for a big U. S. city—conservatively. In Philadelphia there are six definite differences to the redevelopment program:

1. **Redevelopment has been cut down to size.** There are no monstrous single-project solutions planned for Philadelphia. Instead, redevelopment areas have been cut up into separate projects of a size that local capital can take, so Philadelphia need not sit in vain hope of big insurance company financing. This independence has been made practical by a financing system of bonds issued by the Redevelopment Authority itself.

2. Philadelphia’s small takes involve a *minimum of dislocation of present inhabitants*—the people now living in slums (see map; black denotes blight). This displacement and the threat of it have been major political headaches in other cities such as Chicago.

3. By holding meetings in the local areas before drawing any plans, Philadelphia’s Planning Commission has preserved democracy and good feeling, obtained many good ideas that would not otherwise have been forthcoming, done a wiser job in the end, and avoided the friction generated in cities such as New York when a planning boss such as Bob Moses confronts the neighborhood at a “hearing” with a plan already cooked in total disregard of their own feelings.

4. By deliberately preserving local institutions such as churches, schools, clubs, now in the neighborhood, Philadelphia is protecting the social structure of the area as a neighborhood held together by an institutional structure which other cities in their redevelopment and housing projects have unwittingly destroyed (and treating only the spots of worst infection, Philadelphia expects the cure to spread normally).

5. By pulling in architects skilled in urban design (as distinguished from spot architecture) to co-operate with the various architects hired by the separate builders of the separate projects, Philadelphia has evolved remarkable new expedients for making whole city areas harmonious. This harmony does not destroy the individual freedom of the individual operator, but it restores the kind of over-all coherence that has all but disappeared from modern city districts.

6. Where possible, Philadelphia has tried to preserve the historical past of the area, as for example in the Friends’ project—although this has turned out to be more costly rather than less costly. Yet even at a higher price this preservation of “depth in time”—as the AIA’s committee on urban design has called it—has strong spiritual values in giving a sense of *continuity of life* from generation to generation.
Redevelopment areas are carved into many projects in the Philadelphia Way. Below is a plan showing the division of parts of two adjoining redevelopment sites, one project of which is already complete. East Poplar Homes (lower right in area) is, in fact, the first completed redevelopment project under Title I of the 1949 Federal Housing Bill.

Respectability, a prominent Philadelphia virtue, stands triumphant even in the center of depressed areas. And this is the kind of personal triumph which the Philadelphia approach seeks to preserve, rather than demolishing it in general improvement.

The church will remain. The slums beside it will be replaced. Says Edmund Bacon, executive director of the Philadelphia City Planning Commission, "There is a structure of institutions (in all neighborhoods) which has vitality . . . which tie the people together. Redevelopment, whenever possible, should give these institutions new strength and validity."
THE MONEY

The nourishing root of urban redevelopment in the U. S. today is in Washington: the $500 million appropriated by the U. S. Congress in 1949 for that purpose. From this fund, the U. S. triples local money, adding two federal dollars to each city dollar spent for land acquisition, clearance, and resale at less than cost. In this way, the U. S. encourages approved redevelopment projects.

But even before there was federal help, a novel state mechanism had been invented in Pennsylvania for raising redevelopment money, and today this seven-year-old financial strategem provides most of the unique money vitality in the Philadelphia Way:

By act of the Pennsylvania legislature in 1945, local redevelopment commissions were empowered to float their own bond issues, a power hitherto limited to cities, port authorities and turnpike authorities in most states. This makes cheap money (3½% on 40 year tax exempt bonds) available for building, and the manner in which the Philadelphia Redevelopment Commission is using this money is also a new expansion of the redevelopment process.

This process begins conventionally when the City Planning Commission certifies a blighted area for redevelopment (see map of certified areas, above right) and starts work in the neighborhood to stimulate support among the people who live there (which the Philadelphia City Planning Commission does uncommonly well). The blighted area is broken up into projects, which may include: 1) school projects by the Board of Education, 2) city playgrounds and parks, 3) rehabilitation projects by the famed Friends’ Service Committee of Philadelphia, 4) public housing projects by the Philadelphia Housing Authority, 5) good blocks left untouched, and 6) the crucial private developments promoted by the Philadelphia Redevelopment Authority.

It is at this point that most redevelopment authorities go looking for big money from big institutions, but in Philadelphia the quest is not so desperate because of the Redevelopment Authority’s power to issue bonds. For example, when no private investor could be found to put up $1,700,000 (matching $1,260,570 in federal, state and municipal subsidies for the area slated for private redevelopment in the East Poplar Redevelopment area (see map on opposite page), the Authority went ahead and issued bonds, hired an architect, and contracted with a manager for the project. Principal and interest payments for the bonds will be covered by rentals of the project, and the operator is given an exclusive option to buy the project at cost during the 28 years following the signing of the contract. Thus the Redevelopment Authority has made itself a bridge between the private operator and the cheap money market. This may turn out to be the most significant part of the Philadelphia process.

THE MEN

Leading in the cast of the over-all redevelopment picture in Philadelphia:

1. Architect Louis J. Kahn, chief co-ordinating planner
2. Edmund N. Bacon, executive director, Philadelphia City Planning Commission
3. Edward Hopkinson Jr., chairman, Philadelphia City Planning Commission
4. Francis J. Lammer, executive director, Redevelopment Authority
5. Keny K. Kaiserman, chairman, Redevelopment Authority (until this month, when he resigned)
6. Joseph N. Gorson, president of Fidelity Bond & Mortgage Co., whose company is providing some of the private money in the enterprise

The natural calm which prevails along the banks of the Schuylkill even in times of crisis probably accounts for the basic conservatism of Philadelphia’s redevelopment pattern. In 1947 a note of housing alarm was sounded loud and clear to Philadelphians at the memorable City Planning Commission show at Gimbel’s Department Store (Dec. issue ’47) but even then there was no rush to the nearest insurance company for help. Instead there was a period of deep thought, which has given birth to the new Philadelphia program.

This Philadelphia Way is new only because it escapes the violent postwar redevelopment pattern in our largest cities—the neighborhood-leveling techniques of planners like blockbusting Bob Moses of N. Y., who smash enormous rundown areas off the map, and then hand the aching sites to single large agencies or insurance companies for sliderule housing solutions. There are too many links with the past in Philadelphia for this drastic action, too many old cobblestoned alleys which are good for another 100 years’ wear and which (cleaned up) could retain a pleasant memory for Philadelphians of their city’s long heredity. (Even before the American Revolution, Philadelphia was the second largest city in the British Empire.) There are too many trees the Philadelphians don’t want uprooted.

So that was why the “new” Philadelphia Way evolved. That long Quaker silence which settled after the wild success of the show at Gimbel’s five years ago was not the silence of exhaustion or apathy. It has been a time for tough and realistic thinking by the astute planners in city commissions, who shifted into low gear for the long pull toward actual results.

All did not go smoothly with the first of Philadelphia's atomized redevelopment projects, the East Poplar area. Incoherence, the besetting vice of urban operations by independent owners working side by side, almost killed it. When the plan was sent to Washington for HHFA approval, it went as a series of projects designed by different architectural firms. But Washington balked...the principles of the approved over-all plan had been lost, the Philadelphia Planning Commission was told, and other projects of this piece-meal character would be unacceptable.

Bacon, of the Planning Commission, immediately decided that the architects were not at fault, but that the fault was his commission's for issuing weak directives. With characteristic, quick energy he looked for an answer.

He found the answer in Louis Kahn, Philadelphia architect nominated by the local AIA as over-all consultant. (Working with Kahn as landscape consultant is Christopher Tunnard.) For the Temple Redevelopment area, which was already in preliminary planning stages, Kahn did five principal things (see before, left, after, below): 1) he established a setback on a central street, and planted it to make a shady promenade which continues through the separate projects and unifies the whole area; 2) then he added crosswalks from this main stream penetrating back into the housing areas, 3) working with the architects for the project (see page 114 for identification) he got them to realign some of the main structures, breaking symmetry within the different projects in order to maintain the over-all continuity of pattern; 4) he pulled parking spaces away from the promenade, with access from minor streets; 5) he opened up a back alley parallel to the main promenade and made it a secondary axis, a green walk.

Eleven per cent of Philadelphia is blighted, and 17% of Philadelphia's people live in blight.
Landmarks are preserved and integrated into the promenade which leads across the replanned area. (School shown in lower left section of drawing appears also in photograph left.) Plaza in front of one new landmark, a 13-story apartment building, becomes the center of the community. Open space system filtering through community, dividing or intersecting the varied building enterprises, is intended to give cohesiveness socially as well as architecturally.

Another building preserved in the new plan is a flavorful old labor lyceum which will continue to stand in all its towered glory.

Church below (and in drawing left) will be enhanced by making it the focus of a tree-lined crosswalk through the community.
Old fashioned alleys are indigenous to Philadelphia, most of which was laid out long ago in a time of narrow transit. New plans will retain many alleys and will reclaim them from their present second-class condition.

This is the over-all plan for the Mill Creek Area, a redevelopment project further down on the Philadelphia timetable. This was Kahn's introduction to redevelopment; when he and his associates were retained by the housing authority to plan a public housing project in the middle of this area, they first wanted a unified plan for the whole area, as a starting point. So they created this one. Into a typical alley-laced territory (see small plan, left) they brought order (see opposite page) by 1) proposing that the long central street be closed, and turned into a promenade which would act as a linear community green—with all the churches and community services bordering it, and a redeveloped shopping center at each end; 2) closing another street as a cross promenade to complete the pedestrian walkways for the area and knit the old and new sections together; 3) clearing a plaza at the intersection of the two promenades, and also generally redistricting land set aside by the Planning Commission for recreation.

This, too, is a conservative scheme in the truest sense of the word. Not only is this organization of promenades leading to open spaces as old as the oldest Greek towns, but it is expected also to rally the ambition of people in the untouched portions of the neighborhood to save their homes from blight. Kahn knows the Philadelphia slums well, because he grew up in them. The principle of retention of neighborhood values is not theoretical when he talks about it. "A slum is the most closely knit social neighborhood of all. There is more kindness and more natural behavior than anywhere else. There has to be. So you have got to make any redevelopment a product of the neighborhood, or it fails. You have got to search for the things which give the neighborhood its patriotic unity, and retain them. The amateur quality of the building should not be a consideration."

This repatterning rather than replacing of neighborhoods falls in with the general conservatism of the Philadelphia approach, which seeks to leave standing what can be left. Says Bacon, "In almost any neighborhood in Philadelphia it is a shock, as one wanders about decaying sections, suddenly to come upon three or four houses, a half-block or a whole street where each property owner has kept his home in fine condition, all of the houses painted, new fronts, and sometimes even a whole street with the same colored awnings... These cells have within them the latent capacity to restore themselves."
Organization obstructs blight. The pattern above (drawing looks south) laid on a confused neighborhood will stop the mixture of land use which oppresses the area now. The plan started with the design of a public housing project to be situated in the neighborhood on a rise called the "Acropolis" by the planners. Then it was noticed that there were five churches in eight blocks along one central street, so the central street was closed and made a promenade, terminated by shopping centers. Selection of the crosswalk promenade and clearing of a plaza followed in the big patterning of the area.
Hospitals by SOM have these key elements in common:

A balanced design team, a complete program
To achieve a good balance of medical efficiency, sound engineering and architectural quality, SOM's hospital planning teams are composed not merely of hospital specialists but of men with experience in the firm's other work.

Says Robert W. Cutler, New York partner in charge of hospital planning, "By bringing fresh talent to each hospital job we get the benefit of new ideas developed on other kinds of projects. Our hotel experience has helped us to make patient rooms more livable. Knowledge acquired in our industrial and commercial work often improves the layout of a hospital's supply and service areas. And our big housing projects have taught us ways to create a more pleasing environment for people in hospitals."

As a result of this teamwork, a purely medical viewpoint does not dominate the design of SOM hospitals—the architectural concept is the designers' contribution. But the end product demonstrates that clean-lined, economical building shapes can meet medical requirements just as effectively as the more complicated structures produced by many hospital architects.

Long before this team draws a line, its key members practically move in with the staff of the old hospital to determine the needs of the new project. Functions and space requirements of each major element are worked out in conferences with the board, administrator and department heads. Diagrams, flow charts and written analyses are developed for each department, then consolidated into a complete program. This covers both present and future needs, establishes the relationship of the new structure to the old and sets a pattern for further growth before the first new unit is built. Not until the program has been pinned down do the architects turn to the problem of the actual building and site planning.

THE TEAM:


Robert W. Cutler, New York partner in charge of hospital planning, is a member of the American Hospital Assn., was made a partner in 1945.

Nathaniel A. Owings, senior partner since 1936 in the Chicago office, is concerned with hospitals on a national basis.

William E. Hartman, another Chicago partner, is an MIT graduate. He became a partner in 1951.

John L. King, is a general partner with John B. Rodgers for the San Francisco office.
"Favorable orientation of a patient's bedroom is the most fundamental element and must be decided upon first if the hospital is to be properly planned," says Gordon Bunshaft, head of design in SOM's New York office.

This conviction rules out X-shaped plans and leads to the characteristic SOM nursing wing shown on these pages—a simple slab structure with most patient rooms on the south side and services on the north. The patients' side is largely glass, shaded by continuous overhangs which are precisely dimensioned to bar the high, hot summer sun and admit the low winter sun for warmth and cheer.

One school of hospital planners opposes this concept on the grounds that it is uneconomical to put the major part of the patient rooms on one side of the corridor only, that the single-loaded corridor also increases nurses' travel, that big windows not only are of questionable therapeutic value to very sick people but also increase maintenance and heating costs. SOM's answer:

1. Since the required services for each 20-30 bed nursing unit require a fixed amount of space, putting them on the north side of the corridor along with stairs and elevators does not necessarily increase cubage.

2. With the nurses' station located near the center of each unit, this plan cuts nurses' travel as well as any other, and utilities directly opposite rooms lighten the nurses' work.

3. SOM are dedicated to the proposition that a hole-in-the-wall window not only creates unpleasant brightness contrast between glass and wall but limits the view from the inside bed.

4. Continuous windows are more flexible—the amount of light can always be reduced by means of blinds or drapes; a glass wall makes the room seem larger. Movable sash at the far side of beds keep direct drafts off patients.

5. With overhangs designed to permit solar heating in winter, large glass areas actually lower fuel bills. (With an area four and a half times that of its old conventionally designed building, Greenwich, Conn.'s new SOM hospital consumes only one and a half times as much oil; in addition to solar effect this wing enjoyed improved heating design, zoned controls, better insulation.)

One clear advantage of the SOM nursing wing over those with projections, breaks or angled walls is that it permits a modular framing system that lowers construction costs. Column spacing along the length of the wing corresponds to the width of two basic rooms, designed to accommodate either one or two beds. Depending on the type hospital and the budget, these bays are usually 22' or 24' wide.

To those who claim that the facade created by this type plan and structure is "factorylike, dry and sterile," Nat Owings replies, "We don't think you will find factories designed as carefully as that; but anyway we have no particular objection to factories and see no harm in repeating something if it accomplishes the functional objective."

SOM do not contend, however, that the slab-type building is necessarily the final answer to hospital needs. Says Robert W. Cutler, "The hospital of the future may well be split into two separate elements: one, a structure similar to the one we now favor which will give convalescents and chronic patients the benefit of proper orientation and big glass areas; the other, a more compact building, perhaps windowless and completely air conditioned, which will be devoted exclusively to the care of the seriously ill."

Actually, SOM have already demonstrated that the slab building can be designed to facilitate intensive nursing. Certain nursing floors in the hospital unit of their N.Y.U.-Bellevue Medical Center (opposite, above) concentrate one-bed rooms for the very sick opposite service areas, and place larger wards for the less ill at the ends of the wing.
600-bed hospital proposed for New York University-Bellevue Medical Center on Manhattan's East River front is a 20-story slab divided into two parts by the mechanical (seventh) floor. Lower floors, connecting with the six-story medical school at right, accommodate offices, labs and other service facilities; above are operating and nursing floors. Typical nursing floor (plan above) accommodates 67 beds split between two nursing stations. Top floor contains patient recreation and staff dining rooms. Photo shows south (bedroom) facade. (Partners in charge: R. W. Cutler and Gordon Bunshaft.)

108-bed Shoitz Memorial Hospital in Waterloo, Iowa is comprised of three 30' x 260' nursing floors plus a service wing to the rear (north). A pair of two-bed rooms with adjoining toilet is contained within each 18' x 22' structural bay along the south facade, while the off-center corridor and other service facilities are housed within the strip of similar bays along the north wall.
The typical semiprivate room at Mt. Zion Hospital, San Francisco (above) has wall-size windows which give even the inside patient a cheery outlook. Note room's built-in lighting and handsome furnishings.

Four-bedroom plan for Greenwich, Conn. hospital (above) is similar to that for Alexandria Bay hospital (photo, left above). The latter has wall-to-wall windows, but a 3'-7½" sill because rooms face northwest (instead of south) toward a river view. Each bed may be completely isolated by a curtain.

Sun control in Shoitz hospital nursery is provided by draw curtain at the wall-size window, permitting the use of floor space adjacent to the glass.
PATIENTS' ROOMS combine homelike features, nursing conveniences

The bright, cheerful effect produced by the wall-to-wall windows of patients' rooms in SOM hospitals is shown by the photographs on the facing page. Combination of a large fixed glass panel on the side opposite the beds and a smaller section of movable sash on the other side not only keeps drafts off the patients, but permits the nurse to regulate ventilation even when curtains are drawn around the bed nearest the window.

Sill heights are varied to meet local conditions. In San Francisco's Mt. Zion Hospital, glass was carried from the ceiling almost to the floor to give patients the benefit of a view of the city. (A shallow convector forms the sill, prevents down drafts.) But in the Alexandria Bay hospital overlooking the St. Lawrence River, sills are higher than normal (3'-7 1/2") to counteract the cold climate and a northwest exposure, which the clients had insisted on because local inhabitants found more therapy in a view of the St. Lawrence than in a sunny room (photos, opposite).

The cheerful quality of the daylighting is augmented by soft wall colors, often in two related shades on opposing walls. Electric lighting is provided by a night light low on the wall opposite beds and two-way fixtures above each bed. Light, natural finish woodwork in doors and cabinets is favored to help avoid an institutional feeling.

Doors are equipped with stainless steel push and kick plates to aid maintenance.

To reduce the amount of bed-pan handling and encourage early ambulation of patients, individual toilets are provided for as many rooms as possible. SOM share the conviction of the U.S. Public Health Service that the higher first cost of these facilities is offset by long-term savings in nursing care and by a quicker turnover of patients. Plumbing costs are reduced by putting water closet, lavatory and bed-pan spray back-to-back with those of the adjoining room, and running vertical pipe chases between them.

Space subtracted from the room by individual toilets is regained by using the toilet partitioning as a back-up for built-in closets and drawers for each patient. This reduces furniture to a minimum, makes the rooms seem more spacious and facilitates movement of beds.

In line with the best current practice, the four-bed room is the largest provided in most SOM hospitals. Since its width is just twice that of the basic room, the capacity of the hospital can be easily expanded or contracted by adding or removing partitions. Basic rooms accommodate either one or two beds and generally range in size from 10' x 16' to 11'6" x 18', depending on the type hospital and the budget (plans, left).

In finishing their hospitals, SOM follow the maxim, "Save on the low levels and spend on the high." This results in better equipment and more space for the patient.

In patient areas and corridors, asphalt tile floors, rubber cove bases and painted plaster walls predominate. SOM hold that paint not only adds color and warmth to the hospital but can be properly maintained by a well trained staff. Structural glazed block is used in utility areas and ceramic tile in operating rooms—for sterility and cleanliness. Acoustic tile ceilings are used in corridors and utility areas to deaden sound—tile is favored because of ease of replacement. Conductive floors in operating rooms are often composed of terrazzo mixed with carbon black—a technique borrowed from the munitions makers.

Besides providing the patients with open-ended rooms, SOM plan the hospital to bring daylight into as many service and staff areas as possible (with the exception of operating rooms, where daylight is sometimes a liability). For general lighting of corridors and public areas, recessed-type fixtures are favored for appearance, cleanliness and simplicity. The architects think that a certain amount of brightness contrast in lighting adds cheer to the hospital, avoids the institutional look of completely even light distribution. This theory is also applied in patient rooms where two-way lights above patients' beds create an interesting light pattern on walls and ceiling.

SEPARATE SERVICE WINGS improve circulation, simplify structure

Except where land is at a premium, SOM prefer to separate surgery and ancillary services from the main block of nursing facilities. Their reasons:

1. The larger spaces and special mechanical equipment required by these services can be better accommodated in a separate wing with a different framing module from that of the nursing wing. Result: mechanical and structural economies in both units.

2. Obstetrical and delivery rooms in the service wing can be linked directly with the nursing floors which they serve, thus eliminating the vertical travel required when these rooms are above or below the hospital unit.

3. Noise, odors and traffic of service areas are kept away from patients and the danger of contamination is reduced.

Plans on the following page show how SOM have applied this principle to the design of small, medium and large size general hos-
pitals. In the 72-bed Gouverneur hospital in upper New York state, the architects preserved uniform column spacing in the nursing wing and gave most patients a river view to the south by putting services in a wing on the north side. This wing provides space for administrative offices and laboratories on the first floor and surgical-obstetrical facilities on the second. The delivery room is cleanly segregated from operating rooms and is directly adjacent to the maternity unit at the west end of the nursing wing. Kitchen and laundry are on the basement level—above grade because of the sloping site. All services are scaled to accommodate a 40-bed addition at a later date.

In the 108-bed Shoitz Memorial Hospital in Waterloo, Iowa a low, U-shaped service wing provides an excellent circulation pattern around an inner court. Administrative offices and adjacent services are concentrated in the base of the U, easily accessible to outpatients from the entrance on the east side of the court. On the west side, a double-corridor arrangement with operating rooms in the center segregates surgical traffic and gives inpatients access to treatment and diagnostic facilities. From the ambulance entrance on the north side, emergency cases can be moved quickly to surgery. Since this plan combines adjacent services, operating rooms and surgical beds on one floor, elevator traffic is cut to a minimum.

The slope of the site has permitted kitchen and laundry to be located on the basement level without sacrifice of natural light and ventilation. Both these facilities are designed to serve up to 100 more beds which will be added in the future by extending the nursing wing east and west.

This type of horizontal expansion is favored by SOM, because it provides more space for the money (the original roof is saved) and interferes less with operation of the existing building. But site conditions usually force provision for vertical growth.

For the 211-bed Greenwich, Conn. hospital, SOM developed a typically clean T-shaped plan which puts adjacent services and surgery in the stem and south-facing patients' rooms in the crossbar. Plan of the third floor (right) shows how operating rooms fit into the 20'-8" x 18' bays of the stem, while the nursing wing is framed by 20' x 22' bays on the patients' side and by 15' x 22' bays on the service side of the corridor.

Laboratories, radiology and other adjacent services are immediately below the operating suites. Central sterile supply is directly above, linked to surgery by dumbwaiters. Expansion to 400 beds is possible with present facilities.

SOM's clean handling of traffic flow is exemplified by the bank of elevators which links the two units of the hospital. Two elevators, reserved for patients and visitors, open into a pleasant glass-walled lobby; the others, for services, open in the opposite direction to a receiving area for storage of heated food carts.

In larger hospitals, SOM frequently handle the elevator bank as a separate element to simplify framing. At Brooklyn Veterans' in Ft. Hamilton elevators and other vertical services form a connecting link between a wing of adjacent facilities and the main hospital. The service elevators opening into one corridor, and public and patient elevators into another. In the hospital units of Ohio State and N. Y. U.-Bellevue medical centers, elevators are housed in shafts projected from the main building.

For the big hospital SOM prefer to rely largely on elevators for delivery of food and supplies rather than on dumbwaiters or mechanical conveyor systems. Says Robert W. Cutler, "Too much gadgetry can complicate the work of the staff through slip-ups in timing and through mechanical breakdowns. With proper administration, elevators can deliver enough supplies to nursing stations in the morning to meet most of the day's requirements."
STRUCTURAL AIMS: simplicity, uniformity, economy

Structural simplicity is a dominant characteristic of all SOM hospitals. This is achieved by meeting plan requirements with clean, rectilinear building shapes, by stacking like elements to permit uniform column spacing in each major wing, by keeping vertical pipe shafts in clear runs with most horizontal pipe lines in the basement.

SOM prefer steel framing for hospitals mainly because it provides more flexibility for future mechanical and structural changes. Due to metal shortages and the higher costs of steel construction, however, many of their recent hospitals have been framed in reinforced concrete. Details on these pages show simplifications developed by SOM in both systems.

In the new Maternity Pavilion for Los Angeles' Cedar of Lebanon Hospital, exterior columns were set back to permit steam risers and returns to feed directly into convectors below the windows. This not only eliminated bends in pipe, but also shortened the span between outside and inside columns, permitting lighter steel framing. (SOM's John B. Rodgers, partner-in-charge.)

To reduce noise during erection of the 150-bed addition to San Francisco's Mt. Zion Hospital, SOM used an all-welded steel framing system. Column connections (detail, right) were designed by engineer I. Thompson for maximum shop fabrication and ease of erection. Plates and brackets at juncture of beam and column permit "down-hand" welding of all field connections and allow leeway which eliminates precision cutting of beams. Resulting continuous beam structure, far more rigid than conventional steel framing, economically handles wind and earthquake stresses. (John B. Rodgers, partner-in-charge.)

For Ohio State's 600-bed university hospital SOM developed a structural system in reinforced concrete which combines uniform column spacing and flexibility for mechanical runs. By bracketing columns within double beams and using metal pan joists, a row of rectangular openings is provided between each pair of columns. The opening next to corridor columns accommodates the present vertical pipe chases between rooms; the other openings, covered temporarily with a 3" unreinforced slab, may be used to bring ducts or pipes up at any point on the column line to meet future needs. (N. A. Owings and R. W. Cutler, partners-in-charge.)
Their ability to design new building types to meet the new requirements of special hospitals is demonstrated by SOM’s handsome, ground-hugging structures shown here. Like the slab-type hospitals shown on preceding pages, they are shaped primarily by the patients’ needs. But in two of these cases, the dominant need was for a friendly, psychologically helpful atmosphere—one is for crippled children, another, for mental patients. The third is relatively small.

Though the height of these buildings is limited to one or two stories, the criteria which govern the design of SOM’s multistory hospitals still apply: proper orientation for patients’ rooms, structural simplicity, clean separation of patients from service areas.

For the receiving and diagnostic building of Illinois’ Tinley Park mental hospital (top view, opposite), SOM designer W. T. Priestley developed a spreading two-way finger plan which puts male and female patients on opposite sides of central service areas. A series of interior courts brings light and air into these areas and their connecting corridors. The layout of each nursing unit, with all rooms facing south and utilities on the north, carries out the theme of SOM’s general hospitals—except that the nursing station is located at the end of the corridor for control of a spacious dayroom. Courts between the nursing wings provide outdoor recreation space for patients. And to avoid a shut-in feeling, most patient areas will have full glass walls, with lights of tempered glass which will eliminate the need for costly detention screens. The entire plan is based on repetition of a standard 20’ x 20’ bay.

Alexandria Bay hospital (middle view, opposite) is one of three “North country hospitals”—the Edward John Noble Hospitals—located at Alexandria Bay, Gouverneur and Canton, N. Y., among which Gouverneur has central facilities such as the laundry serving all three. These differ from the big hospitals of SOM in that all the functional elements that usually require separate framing are combined in a single simple structural shell—the operating rooms, patient rooms and other facilities being adapted to a single framing dimension. (David Scholes, in charge.)

The Indiana children’s hospital in South Bend (bottom view, opp. page), designed in association with Pohlmeier & Pohlmeier, achieves a similar blend of pleasing environmental effects and economical construction. Two patient wings, with rooms facing south, are linked at one end by a covered porch and at the other by a block of diagnostic and therapy facilities which serve outpatients as well.
Conservative approach led owners of Pittsburgh's new skyscraper—525 William Penn Place—to build a slab reminiscent of Rockefeller Center.

Photos: Ben Schnall; Standard Oil Co. (N. J.); Erna Stoller
THE ULTIMATE SLAB uses the best of proved building techniques, brings to a climax a skyscraper design evolved over two decades

This is the most expensive office building erected in the U. S. since the RCA Building in Rockefeller Center. Named 525 William Penn Place, the 41-story Pittsburgh skyscraper was put up at a bare-building cost of $19.5 million. Obviously, a capital investment of this size (enough to build nearly three such “experimental” buildings as Lever House) called for a conservative approach which meant that experiment, research, innovations—the cornerstones of building progress—had to be left to less expensive projects.

The result is a thoroughly conservative building. It uses the best of proved materials and climaxes the evolution of a skyscraper concept first expressed by Manhattan’s Daily News Building in 1930. In that building, vertical piers and a clean, knifelike roof line set the pace for the design of skyscrapers during the ’30s. Rockefeller Center buildings carried the concept further but all retained massive and monumental bases from which towers and slabs sprang.

Now here is the ultimate slab—without crown, setback or vestigial base. The vertical lines of its ribbon piers flanked by stainless steel fins plunge from a height of 520’ straight into the sidewalk—where entryways are treated simply as elongated window spaces. No store display windows distort the fenestration pattern and no zoning restrictions hamper the sheer rise of its walls.

In it can be seen details borrowed honestly from its fore-runners—the RCA Building and the Empire State Building. Yet each borrowed detail is improved in the transfer. The metal spandrel, for example, was first used on Rockefeller Center buildings—but here the spandrel facing is stamped, not extruded, and the entire window frame plus spandrel skin is a prefabricated unit reaching from floor to floor and bolted in place in one economical operation. The idea of metal fins to help secure the facing stone and to emphasize vertical dividing lines between the “stacks” of windows and the limestone piers came from the Empire State Building—but here the fins are integrated with the window spandrel units producing a 41-story stack which asserts the building’s soaring verticality.

Remarkably similar to the slab of Rockefeller Center’s Esso Building (r.), 525 differs sharply in ground floor treatment. Piers on 525 go straight down into the sidewalk, forming doorways (l.), while traditional concept of a building base was preserved in Esso Building (below).

Prefabricated stainless steel window spandrel facing unit (below) is quickly set in place. Only brick backup and limestone pier facing are needed to complete the exterior wall.
Block-size park and low adjoining bank building will give a degree of openness to Pittsburgh whose narrow streets make tall buildings such as 525 a matter for community concern.

Evidence of new Pittsburgh

How this tall slab came to be is a story of Pittsburgh's top industry: steel, a bank, the valuable ground in downtown Pittsburgh, the zoning provisions of a city which still is in the pre-setback era, plus the impetus toward parklike space provided by the Point Park development several blocks away. But over and above all individual considerations looms the farsighted Allegheny Conference: town planning headquarters de luxe for Greater Pittsburgh and one of its most enthusiastic supporters, Richard Mellon.

Completion of 525 William Penn Place brings Pittsburgh one step nearer its goal of redevelopment (Nov. issue '49). Applying, on a limited scale, the Rockefeller Center principle of juxtaposing buildings with adequate surrounding space, 525 faces its as yet uncompleted counterpart—the Alcoa Building—across a block that will be turned into a park (see sketch) with money donated, in part, by Mellon. (Under this planned oasis will be built a multilevel garage.) Thus the park front of the building is assured enough space for a balanced display of its mass.

On one side, above the low Mellon bank, enough space is left to give light and air to the huge, sheer slab. But conditions on the two remaining sides point up an alarming situation. Here, the enormous slab faces two existing buildings across narrow streets (the curse of downtown Pittsburgh) and blocks out light. To maintain the slab design and avoid setbacks—which could have alleviated the situation—air rights over the Mellon bank were taken and the building line was set 6' further back than was legally necessary. Even so, there simply was not space enough to "carry" the large building. The unhappy condition may spur the city to open up its downtown section in the future, but for the present, the buildings across the streets from 525 are blinded and suffocated.

Two buildings joined

In designing the clean slab building the architects had the problem of joining it to the adjacent three-story Mellon Bank & Trust Co. Building. Both the owner and architects felt the necessity of respecting the bank's stolid neoclassicism in an extension of the treatment of the old building around the base of the new one (see sketch). But after making many studies and models the flaws in the thinking became obvious and a more direct solution was sought.

Many may argue that, while 525 may be the ultimate slab vertically, it is adulterated in plan by the corner notches or reveals. The departure from a simple rectangular slab sprang from an unavoidable site condition: the block on which the building stands is a parallelogram but not a rectangle. The bank building itself is a parallelogram though this is not apparent to a casual observer. Necessarily rectangular, 525 had to be joined with the old bank and oriented with sidewalks and curb lines on the other three sides. Hence the notches or reveals. In addition, the reveals help relate the two dissimilar buildings in a way that repays study. Instead of joining the corners at the outside building line, the junction is recessed. This treatment defines each structure, leaves them widely differing though nonconflicting architectural expressions.

Space for three tenants

Mellon Bank & Trust Co. occupies and owns the first eight floors of 525, a substreet floor and two basement levels. The lowest basement, the lobby and 30 floors are leased by U. S. Steel. T. Mellon & Sons' investment offices occupy the 39th floor. The building is
owned by 525 William Penn Place Corp. of which John W. Galbraith is president.

Typical floors measure 114' x 220', average 18,000 sq. ft. net, show the imprint of Rockefeller Center planning—on which the same architects worked. The service core is at the center of the rectangular floor and no side office space is more than 36' from windows. Deep office space at both ends of each floor is useful here, however, by virtue of later advances not available to Rockefeller Center—high intensity lighting, complete air conditioning and glass office partitions. With these, the corridors and interior offices avoid a claustrophobic feeling.

**Showcase for steel**

Keynote of the building’s extensive use of steel is the lobby. In it, chromium stainless steel sheathes irregularly shaped exposed beams and columns. A black-painted steel pan ceiling conceals pinhole lighting which is reflected from the white terrazzo floor. High level lighting prevails in the elevator lobbies where most of the ceiling consists of fluorescents concealed behind plastic pans. Here again, walls are finished with stainless steel as are elevator doors and cabs.

As a decorative finish, stainless steel is used also for trim around glass doors, for drinking fountains and wall-mounted ash trays in corridors, on counters, and in flatware and table tops in the employees’ luncheonette. Kitchens are all stainless steel, and...
even interior window sills on the executive floor are of the same bright metal. Climaxing the use of stainless steel is the ceiling of U. S. Steel's huge 53' x 26' board room on the 38th floor. Decorative acoustical pans of stainless steel form the luxurious ceiling. The pans were strengthened by a special operation which permits 26-gauge steel to be used, giving the same rigidity as 22-gauge.

As important as the use of many stainless varieties is the use of steel in less obvious forms. Cellular steel flooring throughout (except on mechanical floors) speeded construction, saved weight and gave electrical flexibility to the building.

Full office flexibility was assured with movable partitions of carbon steel panels. After rubber or asphalt tile was in place over an entire floor the partitions were bolted in position.

Washrooms, located in the service core, boast the first major installation of sound deadened, porcelain-enamelled steel wall panels. (Fixtures and partitions are wall mounted.) Electric outlets by washbowls, full-length mirrors in women's rooms, stainless steel towel cabinets and utility shelves add a luxurious note to the rest rooms.

Also in the service core is an electrically operated conveyor system for routing mail and office supplies. Special baskets slide from small ramps on each floor onto arms attached to an endless vertical conveyor. An arrangement of electrically controlled fingers on the arms regulated by a dial at each dispatching station route the baskets to their intended floors.

### Turntable service access

In the basement, a 26' diameter turntable permits off-street parking for trucks in the 27'-6" bay between the loading platform and the outside wall. Basement unloading was mandatory for cash-carrying bank trucks, but the scheme also avoided on-street parking for all deliveries. With the turntable, trucks up to 30' long can easily be handled in the narrow space.

Photos: Ben Schwall
THE CURTAIN WALL COMES OF AGE

First large scale demonstration of lightweight, fireproof, metal-faced curtain wall goes on view this month in two Pittsburgh projects

After a decade of research and experiment, the metal-faced curtain wall has emerged from the test tube to enclose four of the largest postwar buildings: the aluminum-clad Alcoa headquarters and the steel-clad trio of office towers sponsored by Equitable Life—both in Pittsburgh.

Unlike anything ever used before, these metal skins offer certain distinct advantages over masonry. Besides having the properties of masonry (structural adequacy, insulation, fire resistance and flexibility) they are thin in cross section, light in weight, and, because they are built of large panels with relatively few joints, they are quickly erected, highly resistant to rain and moisture penetration and easy to maintain.

The desirability of an efficient curtain wall has long been appreciated, but the difficulties in the realization of this idea proved almost as great as the advantage that might be obtained. Just how serious these difficulties were can best be indicated by the fact that it took architects Harrison and Abramowitz, Alcoa, and the George A. Fuller Co. several years to develop their aluminum-faced wall, while master builder Andrew Eken of Starrett Brothers & Eken has been working since 1946 to develop Equitable's prefabricated stainless steel panel. The complexity of the curtain wall problem is further underlined by the fact that the two solutions achieved in Pittsburgh are diametrically opposed in almost every particular. Apart from its prefabricated aluminum facing panels, Alcoa's wall is built up on the site. On the other hand, Equitable's wall is a complete, prefabricated package which has only to be bolted and welded to the building frame. Both walls eliminate the need for expensive scaffolding.

Designed to simplify and speed up site work, Alcoa's wall is faced with 6' x 12' story-high aluminum panels 1/4" thick but stamped 8" deep in an inverted pyramid shape designed to take a 30 psf wind load. Behind this panel is a 2" to 8" air gap and a 4" wall of perlite concrete with a 1" lath and plaster finish, giving a total thickness of 6" to 13". The wall is erected from inside the building, the perlite concrete being sprayed with McNulty's plaster pumps onto a base of slotted aluminum lath after the facing panels are in place.

Equitable's stainless steel wall consists of an outer skin of 22 gauge 17% chrome steel, backed with a very porous 1 1/2" concrete breather bed and then 3" to 4" of reinforced perlite.
Erection of steel panels

Precast mullion is eased into position (photo, left) where it is first bolted, then welded (below). Section through mullion (left) shows how walls are attached to brackets on spandrel beams.

A 3½ ton corner column section is hoisted into position. Completely prefabricated, all 288 sections used on each floor are placed in an 8-hr. shift. Horizontal section (above) shows structural parts making up wall—column covers, corner column covers, mullions and spandrels. Resultant wall, 5¼” thick, has a “U” value of 0.23, an estimated cost (less research) of $6.80 per sq. ft.

Concrete, making a total thickness of only 5½”. This wall is made in five basic panel sizes. These structural members are: 1-2) two widths of story-high column covers, 11’-9” high and weighing about 1½ tons each; 3) story-high exterior corner covers, L-shaped in plan with 4½’ wings and weighing 3½ tons; 4) story-high mullions 1’-4” wide and 7½” thick weighing half a ton; 5) spandrel wall sections 3’10” x 5’-7” high also weighing half a ton. Thanks to prefabricated construction and careful organization this wall goes up at the rate of a complete story (9,264 sq. ft. of wall) every day.

Steel versus aluminum

Since these two walls involve widely different techniques of curtain wall construction it is useful to study the manner in which each satisfies the requirements of a good wall:
Erection of aluminum panels

Alcoa's wall panels, complete with windows, are bolted to angles hung from soffit spandrel beams. Section (left) shows wall to be 13" thick but half of this comes from diamond pattern on facing.

Section above details wall construction.
This wall weighed only 40 lbs./sq. ft. (panel 24 lbs., perlite concrete 28 lbs., furring and plaster 10 lbs.).

Thickness. Equitable's wall is 51/2" thick compared with 13" on the Alcoa Building, which could, however, have been reduced at least 6" by eliminating the architectural "diamond" feature in the face panels.

Insulation. Alcoa's wall provides better insulation having a "U" factor of 0.16 compared to 0.23 in Equitable's prefabricated panel. This underlines the efficiency of a big air space as an insulating medium.

Weight. Forty lbs. per sq. ft. for Alcoa's wall compared with 42 lbs. for the stainless steel wall, which contains a 11/2" layer of heavier porous aggregate.

Speed of erection. Equitable's wall went up at the rate of a floor a day while the backup wall in the Alcoa building was installed by four 4-man crews at the rate of 2 1/2 floors per week. Thus the prefabricated panels went up twice as fast as the walls built on the site.

Fabrication. Big presses stamp out aluminum panels 6' x 12' at a stroke, whereas the steel must first be formed in strips only 12" wide, which are then welded together.

Rigidity. Being mechanically bonded to its concrete backing, the steel panel is more rigid than the unbacked aluminum though both are designed for 30 psi wind loads. (Most codes require buildings higher than 100' to withstand wind loads of 20 lbs.)

Fire resistance. Both concrete back-ups are designed to withstand a 4 hour fire test (Pittsburgh requires a 2 hour test at 1,700° F.) immediately followed by a hose stream test. The stainless steel (melting point 2,600° F.) would still be strong enough to take the hose test even without backing, whereas the aluminum would have melted away at 1,300° F.

Condensation. The designers of both buildings are confident that they have pro-
Stainless steel sheet, 22 gauge, shaped in 12" wide strips and welded. White lines in this corner section are edges of steel turned in to hold layer of coarse, porous aggregate in position.

A column cover section with reinforcing placed on top of coarse aggregate layer ready for casting of lightweight perlite concrete. Reinforcing consists of 4" wire mesh together with 1/8" strengthening rods.

Perlite concrete cast on assembly line from huge hoppers. Porous layer is 1" to 1 1/2" thick while perlite concrete layer is 3" thick, giving a total wall thickness of 5 1/2" in the column sections and 4 1/2" thick in the spandrel sections.

Provided adequate air circulation right behind the metal skin to take care of any condensation. Both walls provided weep holes at each horizontal joint.

Calking. Joints constitute a maintenance problem in any wall. Alcoa aimed at avoiding this problem by building the inner wall continuous (except for the window openings) from spandrel beam to spandrel beam and from column to column.

On the other hand, the joints between each structural section in Equitable's walls are heavily calked. Starting on the outside there is a 5/8" layer of bedding compound compressed to 3/4", then 5/16" thick asbestos fire-felt, while the inner side of the joint is grouted.

Maintenance, corrosion. Because both aluminum and stainless steel are highly weather resistant and because there are a minimum of joints to be calked, maintenance will be low. The aluminum panels are coated with a 5% silicon-aluminum alloy giving them a distinctive gray color that Alcoa hopes will last the life of the building.

Since nickel for regular 18-8 stainless steel was unobtainable at the time Equitable's walls were manufactured, a 17% chrome stainless had to be used as the best available substitute. This actually cost more than nickel steel because it had to be used in 22 gauge instead of 24. Studies of weathered samples up to 20 years old indicated that almost all cases of rusting occurred when the chromium content dropped below 16% so the chrome content minimum was set at that figure and Builder Eken expects it to retain its finish indefinitely. Engineers will be able to compare the weathering of this chrome steel with that of the regular stainless steel faced masonry walls of the U. S. Steel Building close by (see page 130).

Finishing. After Alcoa's sprayed concrete inner wall is set it is furred and plastered on the inside. On the other hand, Equitable's wall is of completely dry construction except for a little fireproofing on the columns.

As a vapor barrier the inside of Alcoa's wall is coated with a vapor resistant paint. Equitable provided no vapor barrier except that the dry wall under the windows was lined with aluminum foil primarily to deflect heat from the window units back into the room.

Production of Equitable's Wall

The steel faced structural sections are prefabricated in two stages: first the stainless steel facing is shaped and prepared, then the reinforced backup is cast using the facing as formwork.

The stainless steel sheet is shaped into rigid sections about 12" wide which are welded together as required. Before welding, the outside edge of each section is turned inwards to about 1" from the outer facing. Thus the porous concrete, once set,
Alcoa's 6' x 12' panels are stamped in a huge press. After being anodized and finished, the reversible aluminum windows are fitted and the panels are ready for transport to the site.

Photos: Jay Bee Photographic Studio

BUILDING REPORTER

Fabrication of aluminum panels

Acres of aluminum panels in fabricating plant await shipment. More than 80 panels are used in each of the 30 stories of Alcoa's new headquarters office. With the lightweight backup the aluminum skin saved 1,500 tons of structural steel against conventional wall construction.

Corners of aluminum panels are welded together to provide rigidity in the panel. Erection is simplified by having slotted holes in the sides of the panels attached to the supporting angles.

is held rigidly in place behind the metal skin.

After welding, the metal skin for each panel is placed on a steel form shaped to fit the corrugations of the panel, so that it does not become distorted by the load of concrete upon it. The sides of the forms are hinged up for easy manipulation. A 1" layer of coarse aggregate concrete of a dry mix (consisting of only 3/8" screened aggregate and a minimum of cement and water) is laid in the form. This breather bed, so porous that water can be poured right through it, permits moisture to be dried out by natural ventilation.

Once the stainless steel facing is shaped and welded ready to go to the casting yard the face is protected with a layer of plastic skin to avoid damage to the stainless steel surface during transportation, casting of the back-up or erection. This plastic is steamed off when the panels are in position in the wall.

Next wire mesh and bar reinforcement are placed in the form together with the necessary connecting plates and lifting hooks before embedding in a 3" layer of perlite concrete. The mix is 51/2 bags of cement, 1,365 lbs. of fine sand, 17 cu. ft. of perlite and 431/8 gals. of water. This gives a concrete having 1" slump, a strength 2,200 psi in 28 days and a weight of 104 lbs. per cu. ft. This strength was considered sufficient and any increase meant a corresponding increase in weight. After 24 hours, the sections are moved from the forms to pallets for curing and delivery to the site.

A factor in the steel skin wall is the cost of the 300 forms. These cost $300 each, or 15 1/4¢ per sq. ft. of wall, and to enclose a floor each day requiring 288 panels this number of forms had to be continually in use with the factory operating on a three-shift basis. In spite of over 60 re-uses the forms are still good for future jobs.

Lifting hooks, with considerable reinforcing to handling stresses over the whole member, are placed in the top of each panel. Corner columns are also reinforced by diagonal braces which are removed once the members are positioned in the wall.

At the building, column piers and Mullions are bolted and welded at each end to brackets on each floor beam. Bolt heads were attached to the reinforcing before casting. Each bracket supports the top of the lower column and the bottom of the column above it. At each floor beam there are two brackets for each column pier and corner pier, one at each side; only one bracket is needed for each mullion. Spandrels rest on projections off the Mullions and piers where they are bolted into position.

Regarding costs Andrew Eken with this experience behind him, estimates that a wall like this could be built for $6.80 per sq. ft. net wall area, compared with about $9.60 for limestone, $5.40 for brick, and $7.50 for part limestone and part brick. Included in the $6.80 figure is $2.10 for the stainless steel panels, $3.10 for backing them up, and $1.60 for erection, caulking and cleaning. The masonry estimates include an allowance for additional structural steel to
Fabricating the aluminum panel is much simpler than fabricating the steel—so simple, in fact, that a big press forms a 6' x 12' story-high panel and cuts out a 4'-2" x 4'-7" high window opening in a single operation.

After being anodized, the aluminum panels are stamped, trimmed and inspected before the windows are fitted and the panels are taken to the job site and stacked on each floor ready to be erected.

Panels are bolted to galvanized brackets secured to soffit spandrel beams. Slotted aluminum lath is attached flush with the outer edge of the concrete covered spandrel beams and two layers of 3/8" reinforcing rods are attached to channels in the floor and the underside of the spandrel beams. Then, with the window protected by a wooden framework, perlite concrete is sprayed on in layers not more than 1" thick. The mix (1 cu. ft. cement, 3 1/2 cu. ft. perlite, 15 1/2 gals. of water and an agent to reduce viscosity) is placed in a special blowing machine of 8 cu. ft. capacity, which forces out the mixture at pressure of about 15 lbs. per sq. in. (The gunite process, by comparison, uses pressures of 40-80 psi.) This concrete has a strength of 2,000 psi after 28 days and weighs 70 lbs. per cu. ft.

Labor problems
As with any new building technique, curtain wall construction is not clearly covered in union jurisdiction rules. Both sheet metal workers and structural ironworkers claimed the right to erect these curtain wall panels. On the Alcoa building when ironworkers got the job sheet metal workers picketed the building, holding up work for four days. The Pittsburgh Building Trades Council then suspended the sheet metal local for picketing in a jurisdictional dispute and got the rival locals to agree to a truce, while the question was decided by the industry's Joint Board on Jurisdictional Disputes. The job was finally given to the ironworkers but the jurisdictional problem will have to be resolved on each future project by local building trades councils. The Pittsburgh decision does not constitute a precedent.

On the Gateway Center buildings, sheet metal workers, ironworkers and stone masons all claimed jurisdiction, but worked out a compromise settlement. The sections were manufactured by sheet metal workers, hoisted into position by ironworkers and attached by stone masons.
FRANK LLOYD WRIGHT'S MASTERWORK, the Solomon R. Guggenheim Memorial Museum, may be in construction before the end of the year. Plans for this modern gallery, curved around a spiral ramp, were filed with the New York City Building Commission last month. Thus New York City can expect to get its first building designed by the world's greatest architect and the American public can expect to get an architectural masterpiece.

The 50-sheet roll of plans for the building was filed with the help of Holden, McLaughlin & Associates, a top New York architectural firm who made the floor-by-floor space computations and supplied the other detailed data set down on the long forms which initiate the process of securing city approval. (Architects Arthur Holden and Wright have a long friendship based on a mutual respect for de Tocqueville's *Democracy in America.*) Because the building is a continuous spiral, with no division between floors, the routine requirement of estimating space on each floor became a laborious undertaking. But actual differences between this unconventional building and requirements of the New York City code now appear less than many had supposed. The major ways in which this modern gallery may be at variance with code requirements, city building officials said, are these:

1. The building's remarkable openness, which merges exhibit area and access area into a single unrolling space, does not meet fire-safety provisions which require that public halls be enclosed by a fire-resistant wall.

2. The translucent material which the architect hopes to use for a crystal dome at the top of the spiral does not meet the city's requirement for a roof with a 1 1/2 hr. fire-resistant rating. These considerations as well as any other minor variances will be referred by the City Building Commission to the Board of Standards and Appeals, a four-man group chairmanned by architect Harris H. Murdock. While the gallery's reinforced concrete structure is also so unprecedented as to fall outside the stipulations of the city code, city officials are confident that there will be no obstacle to its approval. The Board of Appeals may request certain tests, but engineers who have examined the structural system report that it will meet loading tests without question.

While the plans filed by Wright last month show revisions over the original plans as published by the *Forum* (Jan. '46), the basic concept is unchanged: a wide spiral ramp rises tangent to a half-circle
(containing steeper ramps and an elevator) giving fast access to any level of the continuous exhibit arranged along the spiral. In the new plans the height of the spiral has been decreased by one level and the connecting administration building has been somewhat decreased in size. The Guggenheim Foundation has now acquired the entire Fifth Avenue Block, between 88th and 89th streets, where the Museum will overlook Central Park, and Wright has added to his plans an adjoining 15-story building which will be rented for studios and apartments.

As this remarkable building moved on its way through the many humdrum processes set up to apply to everyday building, it was supported by an immense popular enthusiasm. This enthusiasm, on unprecedented scale, was shared alike by city officials and by distinguished art critics, by the owner and by the public itself. Much of it is reflected in the statements below:

New York City's Building Commissioner Bernard J. Gillroy will determine to what extent the Museum meets the city's code requirements. Said the Commissioner, who is an engineer by training: "There is no question in my mind but that this building will be a great magnet, drawing thousands of visitors to New York City. Wright's architectural conceptions are truly democratic; they do not rely on the architectural sophisticates alone for appreciation, but appeal to something in the imagination of almost every man. Not all things of beauty are restful, but one of the remarkable aspects of this building is its repose, its easy-to-absorb beauty. Wright has an intuitive engineering sense. While many of his concepts cannot be proven by formula, they are unquestionably sound. Laws are written to protect the public from the hazards of the average building. No code could possibly anticipate the advances of an extraordinary structure like this. That's why it is essential to have a body like the Board of Appeals to which such a building can apply for variance."

Harry F. Guggenheim, chairman of the Board of Directors of the Solomon R. Guggenheim Foundation, said: "We intend to carry out the wishes of the founder of the Foundation who saw great inspiration in
Frank Lloyd Wright's architecture and felt that it should be made available to Americans generally. We are hopeful that the plans will be approved by the city. Mr. Wright believes that the small steel sizes used for the network of reinforcing rods may simplify the problem of obtaining materials. Start of construction, of course, will depend on 1) approval of the plans by the city authorities; 2) availability of materials; 3) assurance that the building can be constructed within the sum estimated by the architect.

Curzon Dobell, president of the Preload Co., Inc., is a brilliant engineer in prestressed concrete construction. When Wright was considering prestressing this spiral structure, he asked Dobell to go over his calculations. (For Wright's pres-
ent and more economic structural system, see section below.) Dobell said: "Wright has a great sense of what is within the limits of possibility in structures. In executing this spiral, he was dealing with a tremendous horizontal component thrust, a kind of bursting force at the edge of the spiral. His concept was spectacular even when compared with the most advanced work in Europe and perfectly feasible for execution. His round form exploits the self-bracing characteristic of the circle: the circle, supported and braced from the enclosing wall, is made to act as a spiral cantilever floor.

"This building is extremely efficient. Here instead of a heavy monstrous building, we have a lively, pleasing light structure whose slow gradual ramp completely removes the fatigue and ennui heretofore associated with a trip to the museum."

Speaking for the great public interest in this building, Rene d'Harnoncourt, Director of New York's Museum of Modern Art said: "The news that Frank Lloyd Wright's plans for the Museum of the Guggenheim Collection are soon to be realized is very important news for all who are interested in contemporary art. Whenever Frank Lloyd Wright deals with a new problem he starts with fundamentals and develops new forms. A museum by America's master builder should not only be an architectural achievement in itself, but should also open new vistas for all of those interested in the presentation of works of art.

"I cannot think of a happier occasion for the people of the City of New York who are interested in cultural values than the erection of a building that will give them an important work by Frank Lloyd Wright and enable them to see a great collection of modern art."

Said Frank Lloyd Wright: "Here for the first time architecture appears plastic, one floor flowing into another instead of the usual superimposition of stratified layers cutting and butting into each other by post and beam construction.

"The whole is cast in concrete more like an egg-shell in form than like a criss-cross beam structure. The concrete flesh is rendered strong enough everywhere to do its work by filaments of steel either separate or in mesh. The structural calculations are thus those of the cantilever and continuity rather than the post-and-beam formula. The net result of such construction is a greater repose and an atmosphere of the unbroken wave — no meeting of the eye with angular or abrupt changes of form. All is as one and as near indestructible as it is possible to make a building. Unity of design with purpose is everywhere present and naturally enough the over-all simplicity of form and construction ensure a longer life by centuries than could be sustained by the skyscraper construction usual in New York City. The building is intended by Solomon R. Guggenheim to make a suitable place for exhibition for an advanced form of painting wherein line, color and form are a language in themselves, independent of representation of objects."

"This advanced painting has seldom been presented in other than the rooms of the old static architecture. The paintings themselves are in perfectly air-conditioned, well-lighted chambers, chambers something like those of 'the chambered nautilus,' all are well lighted by natural daylight as well as artificial light. Thousands of paintings are thus provided for. A theater appropriate for special new exhibitions of light, motion, color and sound in varied patterns is an underground and bombproof feature of the building.

"The structure itself is extremely light and strong and will be a gleaming, white plastic-aggregate formed of white cement and crushed white marble in various sizes — in general a matt-finished surface — polished wherever desired. Glass tubing, long tubes laid up like bricks in a wall will form the top-lighting surfaces like the central dome. Interior insulation, wall linings and floors will be of cork stained pale gray or the floors may be of gray rubber tile. It will be completely air conditioned, and there will be no movable windows.

"The nature of this building-design will seem more like a temple in a park on the avenue than like a business or residential structure. The side streets are left wider open than usual and the whole presents an almost unbroken garden-front to the avenue."

STEEL AND CONCRETE SPIRAL RISES LIKE A COILED SPRING: THE RAMP IS A CONTINUOUS CANTILEVER

One of the most fascinating aspects of Wright's work is the skill with which he can develop any given structural system to reach his end. He has studied various ways of building this spiral; none has forced him to depart from his original concept of a "coiled spring." His first design was for prestressed reinforced concrete; this would probably have required expensive winding at the edge of the spirals like that used in huge concrete tanks. Discouraged by the high cost of reinforcing steel, he once "turned the job over to the shipyards" for an estimate on welded steel construction.

In his final system, Wright has hit upon an economical way to transfer the load of the ramp to the surrounding wall by cobweblike networks of reinforcing rods. The section shows how the outer wall is stiffened by a series of vertical fins or braces set at 30° sectors (like the membrane sections of a grapefruit). These fins start at the first floor and gradually deepen to 24° at the top of the spiral, but are a uniform thickness of 6".

"The whole is cast in concrete more like an egg-shell in form than like a criss-cross beam structure. The concrete flesh is rendered strong enough everywhere to do its work by filaments of steel either separate or in mesh. The structural calculations are thus those of the cantilever and continuity rather than the post-and-beam formula. The net result of such construction is a greater repose and an atmosphere of the unbroken wave — no meeting of the eye with angular or abrupt changes of form. All is as one and as near indestructible as it is possible to make a building. Unity of design with purpose is everywhere present and naturally enough the over-all simplicity of form and construction ensure a longer life by centuries than could be sustained by the skyscraper construction usual in New York City. The building is intended by Solomon R. Guggenheim to make a suitable place for exhibition for an advanced form of painting wherein line, color and form are a language in themselves, independent of representation of objects.

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TRIPLE-PURPOSE TERMINAL

designed for travelers, sight-seers and vacationers, built to withstand the jolt of ferry docking

To motorists it’s a ramp; to pedestrians it’s a hard, wooden bench. But architect Lester Tichy decided a ferry terminal could be much more.

Ignoring all the ill conceived, badly executed transportation terminals littering the U. S. today, he took a cue from the most progressive air terminal design to provide not only a comfortable waiting place for travelers but also an attractive place from which sight-seers can watch boats arriving and departing. The high point is a large, window-lined luxury dining room. On the shore side, the owners plan a resort complete with houses, a shopping center, athletic fields, beaches and small boat harbor in the lee of the pier and terminal building.
Luxury dining room for sight-seers as well as travelers seats 105 people, has %" fixed plate glass windows opening south and west on view to boats and ocean.

Odd shape of terminal building (above) was dictated by pier shape and building function. Put on separate pilings (below), terminal is free of pier to keep building from being damaged when boats dock and jolt the pier structure.

Open, sheltered space under bridge on terminal’s first floor is used for service of boats and building. Note neat handling of exterior stairway to waiting room.
Located 15 mi. further out on the Cape from its former site the new terminal avoids the town of Cape Charles's congested traffic and reduces the running time of the ferries by 30 mins. To get the more favorable location, Virginia Ferry Corp. bought 315 acres of farmland adjoining the coast and paid 25% of the costs of extending U. S. Highway 13 to the new terminal. When this Kiptopeke Beach acreage is fully developed, land and road costs will be recovered through the sale of house lots and lease of planned commercial buildings—including a motel, shops and stores—which should turn the beach into a profitable business. Careful plans have been made to this end. Sewage from the terminal building, for example, is not dumped into the water where it would pollute the beaches. Instead, it is carried inland for disposal.

The unostentatious building was designed primarily for function and low maintenance costs. In addition it possesses the sophistication of quiet, rather than stridently sought, simplicity. Its spare, ship-shape exterior has white block walls (finished with stucco despite the architect's doubt about its longevity in that climate), yellow plywood soffits with blue painted metal sash. Columns are either grey or yellow. Setting off the building's utilitarian character is an artfully designed stairway visible from outside through a dramatic two-story window. Its stringers are gracefully arched laminated wood, with white oak treads, open risers and stainless steel rail.

Putting the building on the pier (rather than on the more usual shore abutment) raised the problem of providing strong flexible foundations to cushion sway and shock when the big ferry boats jolt the pier. Solution lay in sheet piling for the pier and sand fill, separate concrete piles for the building. The result is a "floating base" for the terminal and the absorption of lateral loads by the sand and pilings themselves. Cost of these pilings was $8,775—apart from the $228,000 building cost.

First floor of the 13,500 sq. ft. steel and concrete block building is devoted to service facilities: offices, utilities, storage area, sheltered parking space for service trucks and employees' dressing rooms. All public space is on the second floor where the kitchen is the operational center. Sprouting from it are two lunch counters, a cigar stand and service entrances to the 105-seat capacity dining room on the south side. Only other enclosed spaces are tile finished rest rooms along the north wall. Waiting rooms fill the rest of the floor where passengers board boats through a covered bridge. Economic considerations made it necessary to finish walls with plaster. A fan room on the roof ventilates the building and provides year round air conditioning for the dining room made necessary by fixed "%" polished plate specified to resist wind loads up to 80 m.p.h.
BUILDING FOR DEFENSE

... Civil Defense Administration tells
how to strengthen existing structures,
how to design new ones against atomic attack

Though only an utter defeatist would say that World War III is inevitable, all are agreed on a long period of international tension. This could blaze into shooting war if an aggressor nation came to believe that sudden aerial onslaught would permanently wreck the opponent’s economy. Therefore civil defense, the ability to recover from a sneak attack, is as important as offensive weapons for the preservation of Western democracy and world peace.

Following the principle that we should hope for the best but prepare for the worst, we are faced with a number of vital questions:

1. What are the effects of atomic bombs on each of the main types of buildings in our cities today?
2. What degree of protection might these buildings afford for our people and our essential productive machinery?
3. How can this protection be improved most rapidly and economically?

For two years the Shelter Division of the Federal Civil Defense Administration has been studying these questions and co-ordinating field surveys in 53 cities with basic research at Lehigh University and MIT. Now they have some answers.*

CD’s shelter program would protect 17 million people in existing buildings, 16 million by new construction

As a result of preliminary surveys Shelter Division estimates that of some 67 million people living in critical target areas, probably half of these are working in central commercial, industrial and institutional buildings in which right now there is adequate shelter available for not more than 2 million people. With minor and major modifications costing up to $40 per person another 15 million could be sheltered, leaving 16 million people to be protected by new construction at an estimated cost of $90 per head.

In all, $1,800 million are needed for the protection of the working population of our vital target areas, of which half must be found by the states. The federal government is authorized to supply only matching funds for shelter program purposes. States are now busy surveying precisely how many people can be sheltered where, and how these areas can best be strengthened.

So far the amount appropriated for civil defense is tragically insufficient. Out of a total of $535 million of federal funds originally requested, Congress has granted only $75 million. It is evident that more than enough funds for civil defense will never be forthcoming. Realistically, CD points out that the protection

* The answers are detailed in three manuals published this month:
1. Shelter from Atomic Attack in Existing Buildings—Part I. Methods for Determining Shelter Needs and Shelter Areas. This manual sets forth a census and survey technique for determining where and to what extent shelter is needed, also gives a method for selecting suitable shelter areas within existing buildings.
2. Shelter from Atomic Attack in Existing Buildings—Part II. Improvement of Shelter Areas. This manual indicates how existing buildings may be improved to eliminate existing hazards.
3. Interim Guide for the Design of Buildings Exposed to Atomic Blast. This technical publication contains minimum standards and criteria for the design of new structures that will have a reasonable chance of survival half a mile from ground zero—a nominal bomb (equivalent to 20,000 tons TNT) exploded at optimum height (2,000').
Effects of an Atomic Explosion

An exploding atomic bomb generates terrific temperatures and a violent pressure wave. This blast is withstood by earthquake resistant construction at distances of half a mile, but will still damage houses at more than 2 mi. There is an initial abrupt rise in pressure which falls to zero in approximately one second, after which a much less intense suction phase occurs, lasting for several seconds.

Effect of such a pressure wave on a building is equivalent to a heavy blow (of the order of 50 p.s.i. immediately below a 2,000' high air-burst) followed by a steady pressure—in effect, a giant squeeze—on all sides and the roof of the building. After the shock front has passed there remains a drag force of following winds directed away from the point of detonation. This drag force decreases to zero, and is succeeded by a steady force in the opposite direction during the suction phase.

Nuclear radiations have no permanent effect on buildings, but are deadly to exposed persons; even at 3,000' they will prove fatal to about 50% of people protected by 12" of concrete.

Thermal radiations (flash heat) are less harmful to human beings but can set fire to highly inflammable materials. Greatest danger comes from fires spread by secondary effects such as the scattering of furnace and kitchen fires, the shorting of electrical circuits and the disruption of gas pipes, all acting on the mass of combustible materials splintered by the blast.

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In group A buildings, potential shelter areas are selected in each of the basement and the sub-basement (if any) and in each story except the top three, while in group B buildings potential shelters are selected only in the basement. To satisfy CD standards, a shelter area should have the maximum amount of dense material between it and the outside of the building and should be the largest area which meets the greatest number of these characteristics, listed in order of importance:

1. It should be in a part of the building which is structurally compact with close spacing of columns and short span floor beams.
2. The area should be out of direct line with doors and hallways having outside exposure.
3. It should be free of glass, heavy lighting fixtures or anything that might be thrown about by blast.
4. It should have at least one interior stairway—one not adjoining an outer wall.
5. It should contain no furnaces or boilers and no large steam, water or gas pipes.
6. The ceilings should not be of the suspended type.
7. The floor directly above should not have unusually heavy concentrated loads.
8. The area should be as free as possible of furniture or other heavy materials.

Hardly any potential shelter area will be found reasonably free from hazard without a certain amount of modification. CD therefore urges that building owners, architects and engineers cooperate with municipal authorities in making these specifications as quickly and effectively as possible. Far more people can be protected per dollar spent by upgrading potential shelter areas than by any new construction. Additional shelters can be provided later as required, and as more funds become available.
At Hiroshima and Nagasaki CD engineers noted the resistance of various types of buildings to atomic blast:

1. The strongest were reinforced concrete or heavy steel framed multistory buildings designed for earthquake resistance. These have continuous connections between all parts of the structure. Masonry curtain walls may be expected to fail.

2. Next came industrial buildings with strongly braced continuous steel frames. The light coverings generally associated with these structures are likely to be blown away or broken, especially the brittle types such as corrugated asbestos sheeting.

3. Strongly braced wooden frame houses that are relatively low and wide are quite strong, especially if diagonally sheathed. Large glass areas are vulnerable but in shattering may lessen the load on the frame.

4. Light shed-type commercial structures with long spans, light columns and little lateral bracing have poor blast resistance. They are easily pushed over.

5. Masonry wall-bearing structures are especially vulnerable to blast because of their lack of resistance and relatively low strength under lateral loads.

6. Tall, light wood-frame buildings of the tenement pattern are very weak. Their lack of bracing in the walls makes them especially vulnerable to blast and they are very susceptible to fire.

**CD gives first priority to strengthening shelter areas in existing buildings**

Heavy suspended ceilings and fixtures should be removed against the possibility of their being torn free by blast and becoming dangerous missiles. Lighting fixtures should be compact and firmly attached to the ceiling. Steam or gas mains should be housed to minimize danger resulting from rupture. Large water pipes in basement shelters should be relocated or suitable drains provided to minimize the danger of flooding.

Glass which could be blown into a shelter area should be replaced with a soft fiberboard or plastic that would fail by tearing.

Large utilities such as furnaces or electrical equipment should be closed off from a shelter area by a masonry or equivalent wall having a minimum fire rating of 2 hrs.

Internal shelter areas can be protected by building reinforced concrete blast walls, the load of which is carried by building columns. Walls of plaster on metal lath with wood or metal studs can also offer reasonable protection. The blast wall should act as a thin beam spanning from column to column and should be stiffened at least every 20’ by an intersecting wall or column. Where the structural support is available it is desirable to span the blast wall in the short direction from floor to ceiling.

Reinforced concrete blast walls give good protection and should also be designed to strengthen the entire structure by acting as very strong wind bracing. Attention should be given to the danger of overloading, and if that is a possibility the blast walls should be continued right down to the foundations.

Partial blast walls 7’ high might be advantageous. Where limited space is available their construction would be easier, the opening above the wall would allow for blast equalization and the additional weight on the columns would be smaller. Light metal screens should be secured between the top of the wall and the ceiling to stop flying missiles, while entrances should be strongly baffled.

Basement shelters should be strong enough to withstand any debris load that may fall upon them. The roof of the shelter can be strengthened by placing intermediate supports beneath the floor members and thus making them capable of carrying greater loads on shorter spans. These intermediate supports can be supplied by beams mounted on column studs, partitions or masonry piers.
Protection of equipment. Industrial plants are extremely vulnerable to damage and vital equipment can best be protected individually. These pictures show how powerhouse equipment was protected in Germany during World War II. They are taken from Damage Control in Wartime, published by National Industrial Conference Board, Inc., New York.

Precast concrete frames (left) afford most protection but %" steel roofing (above) can be used where there is danger of floors being overloaded. After a direct hit (right) machinery so protected remained undamaged.

Protection of personnel. Among the precast personnel shelters tested by the U. S. Navy at Eniwetok Atoll these thin-shell ribbed panels bolted together to form a dome shelter proved the most efficient. Covered with 2' of earth, they provide safe shelter ½ mile from point of burst.

In new construction CD engineers recommend principles of earthquake resistant design against atomic blast

Blast loads on a building are affected by the intensity of the shock wave, by the size and shape of the structure and by its behavior—that is, whether or not windows or wall panels will shatter and so relieve pressure. Moreover the very short duration of the intense initial loading means that its effect is considerably less than a similar permanent loading and it will frequently be necessary to consider plastic structural action. Most important, there should be no weak link in the structure which might permit collapse before other parts of the structure are brought to full capacity.

In both Hiroshima and Nagasaki, buildings of earthquake resistant design proved the most stable under atomic attack. Therefore to increase blast resistance a procedure similar to seismic design is recommended. The complicated dynamic blast forces are replaced by equivalent lateral and vertical static loads that can be handled by customary analysis.

Shelter Division engineers recommend that equivalent static forces of 90 p.s.f. of gross side area and vertical forces of 70 p.s.f. of roof area be applied to the structure. The floors and roof are treated like very deep beams loaded in the horizontal plane by the forces from the front walls and supported by bents or shear walls at intervals to transfer the lateral loads down to the foundations. Working stresses for wind loads may be used to calculate the necessary resistance. Structures designed for these loads are expected to have a reasonable chance of survival at distances over half a mile from a Nagasaki-type bomb and are estimated to add not more than 5% to the total cost. Buildings could be designed for even greater resistance to blast but this would require so much material as to be impracticable in most cases. In every question relating to building for defense we have to balance our security.

(Continued on page 176)
FOUR-STORY HIGH SCHOOL: Site planning conceals its bulk; floor planning makes its operation easy for students and staff

A four-story school is usually bulky to look at, tiring to climb and difficult to administer. But not this one. It cleverly uses a slope down from the street to conceal its bulk. It bridges the slope with an entry walk to the second floor, making it unnecessary for students to climb more than two flights of stairs. And it distributes its four grades one to a floor, simplifying the administration and circulation problem. Thus it is actually four one-story schools stacked on top of each other.

To accommodate an immediate enrollment of 1,200 and provide for expansion to 1,600, the architects were forced to build their central classroom wing vertically. (A sprawling one- or two-story building would have overcrowded the 17-acre site.) Faced with this fact, the architects took elaborate pains to give their four-story school many of the advantages of today's popular low-lying schools:

- Just as the facade was reduced in apparent height, so the rear was made to appear only three stories high—by setting the narrow (42'-101/2") top floor back from the face of the 67'-9" wide building.

- Direct access is provided to both of the two lower floors. At the front, the entry “bridge” to the second floor is supplemented by an entry walk which follows the slope down to the first floor level. At the rear two entries to the ground floor are supplemented by a ramp leading from the playing field up to the second floor gym.

- Vertical circulation is minimized and easily controlled. Each floor is a one-grade school in itself—complete with administrative office. Stairs are relegated to the ends of the classroom wing. All wings (except the library wing) connect with the second floor. The library connects on the third floor level and is supplemented by reading rooms on the other floors—connected by a book lift.

- Special use rooms are removed from the main classroom wing—connected by buffer zones to minimize noise transfer. To the front, easily accessible from the street, is an open-air assembly area (later to be covered with an auditorium) and the convent chapel wing connected to the classroom wing by the library. Projecting to the rear is the multipurpose room at one end and the cafeteria and gym at the other. Architecturally this has resulted in a well “articulated” building mass—one in which the different uses show clearly and are easy to “read.”

- Classrooms are square in plan—an ideal shape seldom seen in high schools—to decrease the length of corridors and the expensive perimeter. To bring all possible daylight into the deeper rooms the architects will use directional glass block over vision strips.

- Top lighting is achieved in the gym where skylights and prestressed concrete beams form the entire roof. Plastic roof domes in dressing rooms and showers carry out top-lighting scheme in supplementary areas.

- Bad weather outside playing areas are provided by open ground floor space under special use wings.

- Expansion will be easy with eventual enlargements already planned to extend the classroom stem and build an auditorium over the initial open-air assembly area.
From the street, the four-story school will appear only three stories high due to a one-story drop in site. Main entrance is at second floor level of classroom "stem." Special use rooms (gym, chapel, etc.) are housed in wings.
"Each class to be homed in a specific unit or wing. Each unit or wing to be arranged and equipped to meet the needs of the class housed therein."—Teachers of Bishop DuBourg High School.
Four one-story schools

In the main classroom stem, each floor houses one grade, starting with the ninth grade on the ground floor and going up to the 12th grade on the fourth floor. Horizontal traffic on each floor is thus limited to students of a single grade (about 300). Moreover vertical traffic is divided between two sets of stairs, one at either end of the floor where it will least interfere with study.

Each floor is administered separately from its own administration room connected to the central administration area (next to the street entrance) by an intercommunication system.

Even when it comes to getting books the students need not leave their own floor—each floor has a satellite reading room supplied by book lift from the central library, which is in a separate wing on the third floor.

Four special use wings

The detailed organization of the plan is evident in the location of the four special use wings. Gym, cafeteria, chapel, library and multipurpose room as well as the open-air assembly are placed at the ends of the main stem near the stairs to reduce traffic through the classroom areas, and are separated from the main stem by sheltered walkways and vestibules which serve as sound buffers.

Parts of the school which will be used by the community are quickly accessible from the street. Central administration offices are just inside the main doorway. Both the chapel and library are on the street side—accessibility coupled with traffic noises was apparently preferred to privacy coupled with the noise of children on the playing fields at the rear of the building.

Costs

The 2.5 million cu. ft. school plant will cost an estimated $3 million—$1.20 per cu. ft., $2,500 per pupil, or $83,000 per classroom. One reason for the higher-than-average cost per pupil is that central facilities are already in place for the future enlarged enrollment. There is also a generous use of space in lobbies and in the vestibules connecting the various wings as well as such luxuries as semiprivate dressing compartments in the gym shower rooms.

Where students' welfare was not involved, every effort was made to keep costs down. To help their clients thoroughly understand the proposed design and to permit contractors to bid the job closely, the architects not only prepared extensive detail drawings and specifications but also took off the quantities of materials, equipment and furniture required. In some cases several alternate methods of construction were offered for bid. In the case of floor structure, for example, the four types listed below were let out for bid and the one with the lowest cost and fewest disadvantages will be selected.

<table>
<thead>
<tr>
<th>Structure</th>
<th>Cost Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid slab</td>
<td>$1.45 per sq. ft.</td>
</tr>
<tr>
<td>20” metal pan</td>
<td>$1.10 per sq. ft.</td>
</tr>
<tr>
<td>18” x 12” tile filler</td>
<td>$1.55 per sq. ft.</td>
</tr>
<tr>
<td>12” x 12” tile filler</td>
<td>$1.40 per sq. ft.</td>
</tr>
</tbody>
</table>
Side-lighted classrooms

To keep the length of the classroom stem from becoming too long (it now measures 390') and get a maximum number of rooms per foot of exterior wall, classrooms are square (24' x 25'3'') in plan—an ideal shape according to many educators.

Chief problem of such a room shape, of course, is daylighting, and the architects solved it by using light-refracting glass block between the 2'-6'' vision strip and the ceiling. Light through the glass block is redirected toward the ceiling to get maximum illumination to the interior wall. The hung plaster ceiling was sloped from a height of 11'-9'' at the windows to 10'-0'' at the corridor partition to bounce back the redirected light to desks. [But this effect of sloped ceilings is usually overrated—Ed.] On the first three floors, corridors borrow natural light from the classrooms through glazed areas above cabinets and lockers which form the corridor partitions. Fourth-floor rooms are bilaterally lighted with the aid of a south clerestory over the corridor. (See section through classroom wing at top of page).

Rows of hung fluorescent fixtures parallel to the windows supplement natural light in all rooms.

Top-lighted gym

The top lighting of the gym has exciting possibilities. To simulate outdoor light the architects have made the entire roof the light source—it consists of skylight strips alternating with prestressed concrete beams. (These span the short way of the 94' x 110' gym; they are 4' wide at the flange and 5' deep.) To kill the striped effect the architects have hit on a handsome light diffusing medium. Under the roof they will hang an egg-crate baffle consisting of glass fiber curtains 4' deep suspended on frames, so that the eye will see a shimmering soft web up above. At night fluorescent lights hung below the web will produce a comparable effect.

Sound control is helped by affixing acoustical tile to the exposed webs of the prestressed beams.

Shower rooms and semicompartmented dressing space located on both sides of the gym vestibule are top lighted through plastic domes set in the roof.

To make the much-used gym playing floor do double duty, an electrically operated curtain can divide the playing area in half.

The ground floor of the gym wing contains the cafeteria which can serve 20-25 students per minute. A feature here is a continuous conveyor belt system on which students place used trays; the belt carries the utensils directly to the dishwashing area.

Plans for expansion

When enrollment reaches 1,600, the class stem unit will be extended westward to enclose the convent courtyard. Music and dramatic arts programs will get another floor over the two-story east wing.

Student assemblies (to be held at first in the gym) will get a separate auditorium large enough to seat the entire student body in the area now designated for open-air assembly. The initial open-air stage will provide part of the foundation.
Prestressed concrete girders spanning 94'-wide gym roof support skylights. To diffuse the direct sunlight, plans call for an eggcrate arrangement of 4' glass fiber curtains suspended from girder webs. Skylights bear on edges of girders' upper flanges, leaving middle of the flanges for storm drainage gutters.

Future expansion plans envision a third floor added to east wing, auditorium built over open-air stage area large enough to permit assembly of student body.
NINE TOP SCHOOLS:
winners in two competitions
feature wide variety of contemporary design

Long recognized by the architectural press, the merits of contemporary school design have finally come into their own. Guided by a jury of experts,* School Executive, magazine for school officialdom, in its first competition for Better School Design awarded all five prizes and most of its honorable mentions to schools of modern architecture. And this broad decision was echoed in the awards made in another competition sponsored jointly by the equally conservative American Association of School Administrators and AIA.

Concerning today's contemporary schools in general, School Executive's jury commented: "This competition demonstrates that school buildings can be designed from the inside out, and that program requirements need not be fitted—somehow—into some stereotyped building form, as has been the case so often in the past. Most of these buildings evolve in a natural way as the result of a logical interpretation of the educational program in terms of site, space, structure, materials and equipment."

Other excerpts from the jury's comments caption each photograph.

* Architects Morris Ketchum Jr., Robert Hutchins, Walter Kilham Jr., Ray L. Hamon, chief of the School Housing Section of the U. S. Office of Education, and Benjamin C. Willis, superintendent of schools in Buffalo.

NEW BANGOR ELEMENTARY SCHOOL, Bangor, Me. Eaton W. Tarbell & Associates, Architects. "Another outstanding example of good regional architecture based on a skillful use of natural materials and appropriate colors used with a fine sense of scale and proportion. In plan, several wings are grouped together to form open courtyards that are partially sheltered against winter winds and snowdrifts. This school's outstanding achievement is its warm and friendly character." (Scheduled for detailed presentation, AF, May '52.)

MIRA VISTA ELEMENTARY SCHOOL, East Richmond Heights, Calif. John Carl Warnecke, Architect. "Location of administrative and special purpose rooms with their roadways and parking areas on the comparatively flat entrance level and the skillful and bold handling of the classroom wings and their connecting walkways on the steep hillside above both prove the designer's ability to take full advantage of difficult site conditions. School and site blend in a charmingly romantic composition." (June issue '51, p. 185.)

LIDO BEACH SCHOOL, Long Beach, Long Island, N. Y. Reissner & Urbahn, Architects. "This combined elementary-junior high school is a superlative exercise in space composition by a plan which spreads out in a series of well related wings and courtyards. This school shows some noteworthy advances, particularly in a logical use of plastic skylights and in the choice of such easily maintained exterior materials as aluminum sash and porcelain enamel panels." (Dec. issue '51, p. 172.)
ROSEDALE ROAD SCHOOL, Yonkers, N. Y. Edward Fleagle, Architect. "The centralized location of administrative and specialized rooms, which permits expansion of either classroom wing, is noteworthy. The building is also well related to its sloping site. Space, structure, materials and equipment are all competently handled. Indoors and out, the building has a nice residential character."

WILL ROGERS ELEMENTARY SCHOOL, Stillwater, Okla. Caudill, Rowlett, Scott & Associates, Architects. "The excellent regional character of this elementary school has been achieved by careful attention to climate control. The entire solution is based on careful preliminary studies of ventilation, lighting and acoustics. Overhanging roofs shelter classrooms and open play areas against excess sunlight, heat and glare. Its dignity, honesty and simplicity have been achieved at minimum cost." (AF, Jan. '52, p. 144.)

AASA-AIA AWARDS, selected from a field of contestants which only partially overlapped School Executive's, duplicated the magazine's in only one case: the Stillwater, Okla. building by architects Caudill, Rowlett, Scott & Associates (left above). The four other winners are shown above (top to bottom): Senior High School, Oak Ridge, Tenn., Skidmore, Owings & Merrill, Architects; Lee Elementary School, Manhattan, Kan., F. O. Wolfenbarger, Architect; Sunshine School, Fresno, Calif., David H. Horn & M. D. Mortland, Associate Architects (a detailed picture taken of this school will appear in a subsequent issue); Clayton High School, Clayton, Mo., William B. Ittner, Inc., Architects-Engineers.

Photos: Ruth Gray; Rondal Partridge; Hedrich Blessing; Julius Shulman
LIGHTING competition spotlights new trends:
combination of light sources, more plastics,
higher voltages, easier maintenance

Selected from 330 entries in the fourth annual competition of the International Lighting Exposition, these photographs illustrate six highly successful methods of lighting six widely different kinds of buildings, ranging from a textile plant to a shooting gallery. All of them winners but not necessarily prize winners, they were picked by FORUM editors as those which combine good lighting with good architecture—a limited classification in a competition open to electrical contractors, utility companies, equipment salesmen, as well as architects and consulting engineers, and including such miscellaneous subjects as street lighting, airport beacons and floodlighting.

As significant as the individual designs shown on these pages are the lighting trends observed by the jury in its study of all the entries:
• Toward an increasing use of luminous ceilings of plastics and glass
• Toward the combination of light sources: incandescent and fluorescent
• Toward more geometric lighting patterns integrated with the architecture
• Toward the use of special lighting equipment to solve particular problems
• Toward easier maintenance of lighting equipment
• Toward higher voltages—particularly in fluorescent installations
• Toward better quality, higher intensity lighting

The $2,500 contest was sponsored by the Industrial and Commercial Lighting Division of the National Electrical Manufacturers Assn. Winners will be announced May 5 at the Exposition in Cleveland.

Millinery store. General illumination of 125 foot-candles is provided by the luminous ceiling consisting of translucent corrugated plastic hung 18" below rows of fluorescent tubes spaced 18" on centers. Accent lighting of 200 foot-candles is supplied by 40-watt louvered incandescent down lights mounted flush with the ceiling. Vertical perforated acoustical baffles divide the ceiling into 36" strips. Harry L. Nicol, General Electric Supply Corp., and Larry R. Nall, Detroit Edison Co., Detroit, Mich.

Library lobby. Flash ceiling troffers spaced alternately 4' and 5' on centers and containing 40-watt, 60" fluorescent tubes are supplemented by similar lamps in the cove around the circulation desk. Directed toward the ceiling, the cove lights reduce somewhat the brightness contrast between the ceiling and the troffers—the bugaboo of all troffer ceilings. With the aid of the off-white acoustic ceiling tile (60% reflectance), the lighting design produces 48 foot-candles of general illumination in the lobby, 30 foot-candles at the counter. Brightness readings: ceiling, 5.4 foot-lamberts; edge of cove, 4 to 6.8 foot-lamberts. Leonard H. Gussow; Harley, Ellington & Day, Inc.; Detroit, Mich.

Art gallery, measuring 32' x 60' with a 12' ceiling, is lighted by 30 fluorescent fixtures with four 40-watt, 48" tubes each. The tubes are controlled in pairs to permit lighting of the walls or the central area of the room, or both. Fixtures are modified with a central vertical baffle of metal and the two outside tubes are covered with clear glass while the inside tubes (used only for light displays in the center of the room) are shielded with ground glass to reduce glare. Illumination of paintings is 20 foot-candles with only the two outside rows of lights on, 32 foot-candles with all lights on. Brightness: 30 and 34.7 foot-lamberts, respectively. Delbert K. Perry, architect, New Britain, Conn.
School gymnasium uses three types of incandescent lamps to light the 94' square area. Over the playing floor 27 high-intensity (750-watt) fixtures mounted 20' above the floor and spaced 10' x 17' deliver 16-28 foot-candles—an average of 24 foot-candles without shadoics. Each spectator section is lighted to 7-8 foot-candles by a row of four 330-watt fixtures which serve mainly to cut down brightness contrast. Each backboard is illuminated to 35 foot-candles by 300-watt ceiling hung spots. Joseph E. Baker (architect) and C. W. Paine, Ohio Power Co., Crooksville, Ohio.

Rifle range. In the modernization of this room for a rifle and revolver club, a carefully devised combination of light sources resulted in higher scores for experts and beginners alike. On the firing line, 16 indirect 500-watt incandescent fixtures mounted 20' above the floor and spaced 10' x 17' deliver 10-13 foot-candles—an average of 12 foot-candles without shadoics. Over the range four rows of two-lamp fluorescent fixtures produce 60 foot-candles. They are angled at 45° toward the targets and three of them are shielded from the firing line by an inclined baffle (see photo). Targets are illuminated to 130 foot-candles by two rows of seven 300-watt incandescent floods—one row on the floor, the other hung from the ceiling—both 5' from the targets. Result: marksmen at the firing line 50' away can see .22 caliber bullet holes in the targets with the normal unaided eye. Robert G. Watkins (utility man), Detroit Edison Co., Detroit, Mich.

Textile plant is comfortably and efficiently lighted with rows of fluorescent fixtures (two 40-watt tubes with provision for a third) on 11' centers and 16' above the floor hung perpendicular to the rows of winding machinery. An average of 40 foot-candles is delivered to the work surface. Shadows, glare and gloom are practically nonexistent. (Previously the room was inadequately lighted by two-tube individual units hung 7'-5" above the floor and about 11' apart parallel to the winding machinery.) R. M. Person (distributor), Mill-Power & Supply Co., Charlotte, N. C.
"Those March winds drove the rain right into our new warehouse as if its block walls were cheesecloth."

"Within six months after we moved into our new branch office building, we had to recall the mason contractor to patch up the brickwork."

"Our stone library walls looked fine when they were finished, but you should see them now!"

Such laments are typical of the continual chorus of complaint inspired by faulty masonry wall construction. Unfortunately, too many architects and builders think of a masonry wall simply as so many small units laid one on top of another. This explains why too many walls crack and leak.

Building a presentable, durable, weathertight masonry wall is a complicated operation whose success depends on many factors—some controlled by the architect, some by the builder. Here is my philosophy of good masonry construction:

1. Study the frame in connection with the masonry wall and eliminate all restraints which may cause joint failure.

2. Analyze the characteristics of hollow backup units, particularly their dimension.

---

MIT's construction experts analyze the oldest form of construction, recommend eight ways to make it meet modern standards of appearance, strength and weather protection—an article by Professor Walter C. Voss*

3. Choose, if possible, masonry units with an absorption of 4% to 10% for facework and not to exceed 15% for backup. Units with higher absorption rates should be controlled by uniform wetting.

4. Select a mortar which is not too rigid and has characteristics of reconstitution and reasonable elasticity. Know the composition of the cement.

5. Insist upon delivery of dry units; keep them in dry storage; lay them dry (unless their high absorption rate requires that they be laid wet); and protect them after laying.

6. Use a dense joint forced back against the brickwork after initial shrinkage has taken place. Never point wet mortar; strike only when it is thumbprint hard.

7. Avoid excessively acid cleaning washes—preferably use none at all. Clean with plain water or ordinary soap powder and water, removing all fins and mortar blotsches with a stick and fiber brush.

8. Study the effects of thermal and wetting expansion and contraction to free the wall from excessive restraints so it may move without serious stresses. Let the wall float—flexibly restrained but not clamped.

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Walls of various kinds present different problems. Bearing walls are always more weatherproof than curtain or panel walls of the same detail, simply because their heavier dead loads produce more intimate contact between the masonry units and the mortar. In high buildings the design of curtain walls is complicated by the elastic consolidation and lateral forces imposed by this type of structure. This requires very careful consideration of the movement characteristics and the construction details at interruptions in the envelope.

While use of the continuous frame permits construction economies, improper detailing may raise maintenance costs and cause eventual cracks and leakage. Reason: continuous frames are more likely to transfer stresses over greater distances than simple frames.

Because wood framing of simple spans is not bonded to the masonry and therefore allows movement without excessive stress, it creates little displacement of the masonry. Wall-supported structural steel and precast reinforced concrete frames behave similarly except that bond is usually present and refers movements to the walls.

Types of walls. Research has proved that weather tightness of a wall increases with the number of continuous vertical mortar barriers or withes between the wall's two faces. A single vertical mortar withes will increase weather resistance as much as six times. A solid 8" brick wall has no such mortar barrier—headers extend through the wall. To create a continuous internal mortar barrier in an 8" wall, many architects specify full stretcher or clipped header courses bonded with galvanized ties. Such walls have given excellent weatherproofing results while many header-bonded walls have failed. The usual 12" solid brick wall or the wall of 8" solid brick backup faced with 4" ashlar also provides a single continuous vertical mortar barrier. If the header bond courses of the backup are properly spaced to occur between the horizontal joints of the facing brick or ashlar, even greater protection is afforded.

Where hollow backup units are specified, we are confronted with an even more complex and troublesome problem. Most units now available have faults from the point of view of weather tightness and these must be overcome in construction. Hollow backup units are usually laid with their walls

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*This article is based on a paper delivered by Professor Voss, Head of MIT's Department of Building Engineering and Construction, before a recent meeting of architects and contractors at Birmingham, Ala.

Masonry wall ruptures due to thermal expansion of the frame

(Continued on page 184)
REASONS FOR SPECIFYING GARAGE DOORS for your Commercial, Industrial and Residential Jobs

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Commercial building needs credit

From now on credit, rather than materials, will determine the volume of commercial building. The prospect of more steel, aluminum and copper does not, therefore, mean a marked recovery from the present slump in commercial building. Even if materials controls are substantially eased as promised by NPA, credit control—the Federal Reserve Board's Regulation X—will remain. And Regulation X is tough on commercial building, limiting the loan to 50% of value. Federal Reserve says this is not as tough as it sounds since the regulation permits the loan to be based on capitalization-type appraisal under which the loan might be much more than 50% of the investment. Owners and promoters, however, complain that lenders are conservative in their appraisals and rarely go over half of replacement cost. The result is often an equity requirement of 50% or more.

Anyone who has ever arranged the financing of a commercial structure knows what a rare bird 50% equity is. It is a fit inmate for a financial zoo; it certainly doesn't run around loose. Efforts to evade the regulation by sale-lease-back deals or by financing on other than mortgage security are not avail. Such transactions, if not hooked by Regulation X, are netted by the Voluntary Credit Restraint Program. There is no legitimate escape.

Yet up till now there is no indication that credit relaxation is being considered.

Commercial building has been hit harder than many realize. Because commercial building activity—warehouses, office buildings, loft buildings, stores, restaurants and garages—came through 1951 with a slight gain over 1950, many believe this kind of building has not been severely hurt by controls.

The facts prove otherwise. Item: the gain was made almost wholly in the early part of the year; the last six months of 1951 showed steadily growing declines from the corresponding months of the year before. Item: the decline became much sharper after NPA's very rigid restraints on new commercial building starts for the last quarter of 1951 and the first half of 1952. Item: most commercial building that did go ahead in 1951 had had its financing arranged before Regulation X had been imposed and before the end of the easy money days last March. Item: for the first two months of 1952, commercial building activity was running more than a third behind the volume for the same period a year ago. (Only recreational and amusement building—almost entirely banned by NPA—has been hit harder.)

Five good reasons for relaxing credit control on commercial building activity:

1. From now on the duration and seriousness of the present slump in commercial building will be determined mainly by the availability of sufficient credit to make financing feasible.

2. There is little prospect that construction activity in 1952 will be inflationary. On the contrary, it will probably be deflationary, with an unavoidable slump in commercial building.

3. Because of the long time lag between decision to build one actual expenditure, an early relaxation of credit is needed to prevent the slump in commercial building from continuing and perhaps becoming more serious in 1953.

4. Commercial activity since World War II has lagged behind its historical relationship to total building and to the economy as a whole. Credit relief is needed to prevent further distortion.

5. Credit control discriminates against commercial building in favor of industrial building, even though commercial is behind demand while the industrial may be reaching saturation.
Outlook for the year is for a volume of commercial activity no more than 60% of last year's total. And even if credit relaxation should be added to the easing of materials controls, the result would not be greatly different. It takes almost as long to get ready to build a commercial building as it does to build it. Land acquisition, architectural and engineering plans, financing negotiations, permits and so forth consume months. Aside from the 1,000-odd projects awaiting NPA approval at the middle of March, it is doubtful that many additional projects, except those of a very small size, could be started during 1952. A 1952 commercial building slump is a certainty.

There is nothing inflationary in the construction outlook to justify credit control of commercial building. Regulation X has only two reasons for being: 1) to help conserve critical materials and 2) to help restrain inflation. The first, on the basis of NPA's own actions, no longer is important. The question of inflation alone remains.

The probability of renewed inflation in 1952 has fewer supporters than only a few months ago. On the contrary, the prophets of economic relapse are becoming more and more vocal. Without engaging in this broader speculation, there is nothing to suggest that construction itself can raise much of an inflationary wind during 1952. Here are the portents, in addition to the slump in commercial building:

1. Total volume of construction—private plus public—will at best fall short of 1951.
2. Military construction is running behind expectations.
3. Local public works programs are generally lagging and cannot be rapidly increased for the same reasons that commercial building cannot be rapidly stepped up.
4. Private residential building at best will fall short of last year.
5. Industrial building will peak sometime in the third quarter.

All along the line there are signs of weakness, in relation either to what was built last year, or to what was expected this year, or both. No inflationary dangers lurk in these shadows. Instead, there is more than a little risk that the decline in private activity may become more serious in 1953, as a drop in industrial building is added to that in commercial activity.

The best offset to the inevitable slowing down of industrial work would be an increase in commercial building. But many plans for commercial building will be deferred so long as the prospects of feasible financing terms are slight. Thus responsibility for risking a building slump is on the managers of Regulation X.

(Continued on page 168)
Commercial building needs credit relief

Commercial building has been running behind its historical relationship to other trends. The desirability of encouraging commercial building rests on other grounds than that of furnishing a temporary stabilizing mechanism. Since the end of World War II, commercial building has been running behind its historical relationships to industrial building, total private building and gross national product.

In the past, industrial building has usually played second fiddle to commercial building except in war years. For every five-year period since 1920—the first year for which records are available—commercial has run ahead of industrial except during the war years and for the period after World War II. In the latter years, relationships were reversed. The graph (p. 167) points up this story:

1. After World War I, commercial was usually ahead of industrial. Since World War II, it has been ahead only two years out of six.
2. Since 1946, commercial building has been lower in proportion to total private activity than the average of any five-year peacetime period after 1920. Industrial building has kept pace better.
3. Since 1946, commercial building has not been much greater than it was in the high building years 1925–29, when population and national income were both much smaller than now. In terms of physical volume, commercial building since the war has averaged about half that of the 1925–29 period.

Compared with the gross national product in the two postwar periods, the contrast is even more striking. During the first half of the 1920's, commercial building averaged 0.8% of the average gross national product. During the second half of that decade, the ratio rose to 1.1%. For the five years 1949–50, however, commercial building averaged slightly over 0.4% of the national product.

It is clear then that, even in the time of the easy money market between 1946 and the Korean outbreak, commercial building did not keep pace with the growth of the economy. A change in Regulation X would help to prevent the lag from becoming more serious.

Regulation X is unduly discriminatory against commercial building. As an example of "selective control," Regulation X permits a few officials to substitute their judgment for that of the market as to what types of activity are most beneficial.

So long as the whole community is generally agreed on the objectives—that, in dire emergency, materials must be conserved for defense purposes and that consequently, industrial building to provide for defense needs may be more essential than commercial construction—such an official judgment will be tolerable. However, when the problem of distributing materials no longer exists, when the nation's industrial capacity has been brought to the required level, and when the control of inflation remains the whole consideration, the discrimination as between one type of demand and another no longer is reasonable or desirable.

If, amid a free market for materials, inflation should still prove to be a threat, then the measures to be taken should be those of general applicability, which affect the whole demand for credit, but leave individual claimants in their normal competitive positions. In particular, little justification can be made of a policy which holds back commercial building, which is already seriously lagging, and continues to give free rein to industrial building, which may be threatened with overexpansion.

For this, if for no other reason, the grip of Regulation X on commercial building should be eased. The reluctance of the Federal Reserve Board to let go altogether is understandable in view of the serious problems of debt management that may lie ahead. Nevertheless, caution may be overdone. A relaxation to permit a two-thirds loan-to-value ratio in place of the present one-half would bring Regulation X into line with the Voluntary Credit Restraint Program. It would still exercise restraint on purely speculative ventures, but it would let needed sound projects get under way. The time is over-ripe for such a move.

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HOLLOKORE DRILLED PERFORATIONS
The Hollokore Drill (cross section sketch shown above) developed by Simpson Research and Engineering, is responsible for the clean round perforations of Hollokore. In the enlarged unretouched photograph reproduced above, notice the clean-cut holes...no fuzzy edges...no loose fibers to encourage unsightly bridging when repainting.
Fifty-three acres of production space in this giant plant are reliably served by "packaged" General Electric power distribution equipment.

Tanks Roll in 7 Months at New Plant

Secondary power distribution in the new plant is made on a 480-volt grounded-wye system—for greater safety, better system operation. This is one of 18 new 1500 kva E load-center unit substations added during the plant conversion.

G-E power distribution equipment—easily specified, quickly installed—helps speed plant conversion to defense production

This new plant is an outstanding example of rapid conversion to defense production. Despite many obstacles, the first tank rolled off the line only seven months after the World War II plant was taken over. A major project in the conversion effort was the complete revamping and expansion of the electrical distribution system to meet the heavy demands of tank manufacture.

Selection of General Electric equipment helped speed conversion in these ways: (1) co-ordinated systems are readily designed around easy-to-specify G-E equipment, (2) "packaged" G-E equipment is quickly installed and connected, and (3) when substantially all power equipment is G-E, we will co-ordinate manufacture and shipment of system components.

You can gain these time-saving benefits for your industrial plant projects by specifying dependable, user-preferred G-E distribution equipment. And remember, G-E application engineers are ready to advise and assist those charged with distribution-system planning and design. Contact your G-E apparatus representative. And write for new brochure GEA-5600, "Electric Power for Industry's Third and Largest Expansion." Sect. 665-115A, General Electric Company, Schenectady 5, N. Y.
Look at the flashing in this photograph. The pieces forming the counter flashing not only hang loosely, but are simply tucked into the mortar joints. As a result, the flashing offers little, if any, hindrance to water penetration.

Sound flashing of chimneys calls for a design that will intercept, and divert to the roof, water that has permeated the masonry. The drawing at the left illustrates a practical flashing method which is quickly and easily installed. Note that the cap flashing, extended through to the flue, will stop the downward flow of water which has been absorbed by the exposed masonry. Both the cap and base flashings can be readily fabricated in the shop so as to be available on the job when needed.

WRITE FOR DETAIL DRAWINGS

The purpose of recent research and investigation by Anaconda building specialists has been to develop methods of using a minimum of sheet copper for maximum results in the protection of buildings from weather.

This work has resulted in a series of drawings which show suggested detail of new applications and improved methods for sheet metal work. These drawings, including the ones shown here, are available in a complete portfolio on 8½" x 11" sheets convenient for filing. Send for your set now. Ask for Portfolio S. Just write to The American Brass Company, Waterbury 20, Conn.
In 4 simple operations, the cylinder of the new Russwin "Stilemaker" lock can be reversed for a different hand of door. It takes less than a minute. No serious installation delays if hand of door has been changed. When time is at a premium, this and other advantages of the "Stilemaker" lock count heavily in the architect's favor. Ask your Russwin Distributor for complete description of the advance-design "Stilemaker".

Russell & Erwin Division, The American Hardware Corp., New Britain, Conn.

BUILDING FOR DEFENSE

(Continued from page 151)

ty against cost and to use what limited labor and materials we have available so as to give the highest average protection per dollar spent.

There is one basic difference between seismic design and blast design. For earthquake resistance, structures should be as light as possible since the forces involved increase generally with an increase in the weight of the structure. On the other hand, for blast resistance, mass is helpful. The over-all blast loads are proportional to the areas exposed and only those areas exposed to unbalanced forces are affected.

Shelter areas need special consideration. They will usually be sited in the central core of a multistory building and either exterior walls or interior partitions surrounding them should be designed for survival. They should be of concrete, 8" thick, reinforced with 5/8" rounds at 6" o.c. designed for a minimum lateral load of 150 p.s.f. and be firmly tied to supporting members.

Floor weaknesses are 1) the possibility of buckling of the floor slab, prevented by stiffening ribs running perpendicular to the outer wall, or 2) the possibility of failure at construction joints, which can be avoided by extending reinforcing steel far enough through the joints to develop maximum strength.

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The possibility of unbalanced blast pressures will have to be considered. For instance, where the space beneath a floor does not contain openings or breakable panels amounting to 20% of the lower story wall area, the floor should be designed for a live load of 100 p.s.f. acting towards the unvented region. Similarly, horizontal and vertical pipe galleries should be vented with breakable panels about 25' apart and amounting to about 20% of the area.

Elevator shafts may also admit blast pressure. Their walls should be designed to withstand a pressure of 150 p.s.f. from either side. A reinforced concrete cap, for instance, with holes for the various cables, should be placed on the top of the shaft designed for similar 150 p.s.f. loading.

In short, venting may be more easily permitted than prevented, and panels should either be very weak or very strong. If designed to fail they should be light, relatively fragile sheets such as gypsum or asbestos that will disintegrate without forming dangerous missiles.

For new construction CD recommends a central protective core area, says the extra cost is not more than 5%.

If more or less identical shelter areas are constructed in all stories of a building by placing blast walls at corresponding locations, the result is essentially a structure within the structure which may be called the protective core. In addition to defining relatively safe, more or less central areas that can be used for shelter or vital storage, such a core provides additional shear resistance to the building as a whole. Each shelter area should have a minimum of two exits and it is desirable that the core should contain stairs.

It is best to leave enough openings in the protective core so that pressure equalization is quickly achieved on both sides of every
These openings must be arranged with a series of strong baffles to minimize the danger of debris entering the shelter area.

For existing factories CD suggests ways to protect personnel and vital equipment

New construction affords the best opportunity for including protective measures at minimum cost, but existing structures can also be strengthened. Blast damage can be reduced by strengthening against lateral and downward forces, by the removal of irrelevant features that might be dislodged and by the elimination of fire hazards.

Industrial-type buildings with saw-tooth type roofs are especially vulnerable to blast damage. The most effective measures will be 1) to reinforce the structure and thus eliminate any weak links that would permit collapse before other parts of the building have reached the full capacity of resistance, and 2) purposely to provide a weak connection between the frame and the curtain walls so that the latter can easily blow away (again without creating a missile hazard) and so permit pressure equalization inside and outside the building.

Complete protection of industrial buildings against blast is impossible. It will therefore be necessary to protect personnel and the most valuable equipment in the plant. Precast concrete walls can be used to protect both men and machinery. They can be pre-fabricated in segments in a ribbed shell concrete design as suggested by Arsham Amirikian, head design engineer of the Bureau of Yards and Docks. Such shelters, erected in whatever span was required and carefully sited on the manufacturing floors of large plants, proved invaluable in Europe during the last war in reducing the number of casualties to both men and equipment.

CD stresses the need to plan rescue operations before the attack

Adequate protection against bombing will require very comprehensive and detailed planning to avoid panic and to allow first aid, rescue and fire-fighting teams to operate after an explosion. These teams, and their equipment, must be in protected structures to avoid incapacitation. Utility lines and sewers should be protected and there must be reserve water supply points for the control of fires. These matters should receive the very highest priority and the first allocation of whatever limited funds are available.
YOU have always recommended paneled walls for appearance. Today with scarce, high-cost maintenance labor, you can also recommend them on the basis of economics. The higher original cost of installing plywood is often offset in ten years or less by savings in painting, paper hanging and maintenance.

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In the openings between an enclosed loading dock and a large food warehouse illustrated below, twenty-four Mahon automatic closing, Underwriters' Labeled Rolling Steel Fire Doors were installed to protect the contents of the building. These doors are manually operated in normal service, but are equipped with fusible links and an automatic closing device which quickly closes the door in case of fire. Mahon Underwriters' Labeled Rolling Steel Fire Doors, like all other Mahon Rolling Steel Doors, occupy no usable space inside or outside the opening...they are built to give a lifetime of trouble-free service...for instance, the galvanized steel for the interlocking curtain slats of Mahon Rolling Steel Doors is chemically cleaned, phosphated, and chromated to produce paint bond, and the protective enamel coating is baked on at 350°F prior to roll-forming. This is just one of the extra value features of Mahon Rolling Steel Doors—you will find others if you check specifications carefully. See Sweet's Files for complete information, or write for Catalog No. G-52.

MAHON STANDARD POWER OPERATOR 929-P


Mahon Release Device and Governor on the Automatic Closing Mechanism of a Mahon Rolling Steel Fire Door. Fusible links release the mechanism in case of fire and the door closes automatically.

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Manufacturers of Rolling Steel Doors, Grilles, and Automatic Closing Underwriters' Labeled Rolling Steel Doors and Fire Shutters; Insulated Metal Walls, Steel Deck for Roofs, Partitions, and Permanent Concrete Floor Forms.
General contractor and technical supervisor of Standard Dry Wall Products, Inc., plan correction of an extreme condition existing in bleacher seats at Braves Field, Boston, Massachusetts.

Right photograph shows soffits of concrete seats where concrete has blistered away from reinforcing rods. Rods were sandblasted and sealed with THORITE Patching Mortar and entire undersurface sealed with THOROSEAL.

Above photograph shows THOROSEAL FOUNDATION COATING being grouted into upper, or wearing, surface of bleacher seats.

General contractor, Henry Gironi, Allston, Massachusetts, an expert, with long experience in masonry maintenance, rehabilitation and surface protection, performs correction task on Braves Field, with satisfaction to all concerned. Waterproofing Products, Inc., Allston, Massachusetts, furnished the materials.

THORITE Patching Mortar was used for sealing rods and patching cracks and blisters in concrete. THOROSEAL FOUNDATION COATING was used for grouting wearing surfaces.

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—used in many prominent modern buildings

Here is one of the nation’s prominent modern schools with a radiant heating system supplemented by mechanical ventilation—completely controlled by Powers.

For flexibility of adjustment and better control the temperature regulating system is divided into six zones.

Each Zone—is heated by circulated hot water regulated by a Powers MASTROL system which controls temperature of water in relation to outdoor weather. Ventilation for each of the six zones is supplied by large unit ventilators controlled by a Powers duct thermostat operating Flowrite valves and dampers.

Auditorium is heated by a central fan ventilating system. Gymnasium is heated by two large unit ventilators. Both types of ventilation circulate room air except when rooms are occupied at which time outside air is proportioned to the load. Temperature in both of these spaces, as well as in the Locker Room, is regulated by various Powers controls.

Steam Boiler Control for Varying Loads Three oil-fired boilers here are regulated by a Powers No. 252 Pneumatic Pressure Regulator controlling three PE switches which cut in the right number of boilers required for the heating load.

Powers MASTROL System of Control is ideally suited for radiant heating. It has been widely used to control many types of forced hot water heating. Performance records show it unsurpassed for reliability. Maintenance cost is practically nil.

When problems of control for any type of heating or air conditioning arise, call Powers. Our more than sixty years of experience in supplying control for important buildings may be helpful to you.

Powers MASTROL System of Control in each of 6 zones regulates the temperature of water circulated from steam heated hot water converters to various rooms. Temperature of water is maintained in direct relation to weather outdoors.


Only a few of our many types of control for Radiant Heating are shown here.
ETTER MASONRY WALLS

Three methods of construction using concrete block backup result in walls of varying quality: 1) Usual practice of laying up brick first and parging it results in unfilled vertical spaces between brick and backup. 2) When backup is laid first and parged, vertical joint is filled, but moisture passage through header brick leading into void of backup block is still present. 3) Mortar barrier dams the water passage, and a strip of metal lath holds continuous mortar bed to produce a still better wall.

vertical but sometimes, as in the case of clay tile, these elements are horizontal. In either case it is difficult to create full, sound mortar bed and end joints. When laid vertically, a complete bed joint depends upon the thickness of the walls. (In this respect concrete block or tile is less troublesome than clay tile, unless it is of the double-walled high load bearing type.) Vertical joints in these cases are discontinuous or entirely lacking except for indifferent face mortar pads. Even these may fall off in laying and be pointed later with only a "lick and promise." In addition, when such a wall encounters a facing bond course of brick, the headers lead directly into the voids of the unit (see figs. 1 and 2 above) so that any unfilled or partially filled side joint in the header course can lead water directly into the backup voids to travel no one knows where. When the backup is laid with the walls horizontal, the vertical and joints present an even greater problem and cause a great deal of leakage. Header backers so commonly used in this type of wall construction are no better except that they do allow the backup and the facing header course to break joint. Where facing is applied to a wood frame or to cast concrete, the problem is not usually leakage but anchorage, for this type of backing provides a positive dam to the entrance of water, when properly constructed.

Methods of construction. Regardless of type, a masonry wall must be well built to be durable, presentable and weather tight. Construction practices which affect quality include the sequence of laying, conditions at time of laying, pointing and protection.

Where hollow backup units are used the usual procedure is to lay up the face brick to bond course height, parge the brickwork, then set the backup block or tile. This procedure has been responsible for much faulty masonry work, but the inertia of contractors and architects still prevents improvement. Several things are bound to happen if walls are laid up this way (see fig. 1, above). First, the joints in the face brick are likely to be broken if enough pressure is applied in parging to do a good job. This very definitely spells trouble later. Furthermore, in setting the backup tile it is necessary to fill the vertical face joint behind the parging—a joint which may be as deep as 12" in the case of...
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The table in this attractive Reynolds Metals conference room shown below is surfaced with walnut Micarta® over aluminum foil. It is immune to burning cigarettes, cigars, doodles and pencil scrapes. It is always ready for the next meeting—can be cleaned with a damp cloth. Another typical example of Micarta’s versatility.

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PERFORMANCE FACTORS
of aluminum awning-type windows

Every day, more and more architects and contractors are turning toward aluminum awning-type windows. These newer, more modern windows are being specified for all types of construction, including factories, commercial buildings, apartments, hotels, schools, hospitals and homes. Over a period of years, the aluminum awning-type window has been subjected to rigid and exhaustive tests to determine its performance characteristics and operating efficiency under every known weather condition. This research has been carried on by the leading manufacturers in cooperation with leading architects.

THE “OPEN” WINDOW

One important advantage in favor of the aluminum awning-type window is that it can remain “open” to provide ventilation and fresh air circulation even when it is raining. Slanting sash is the answer. One aluminum awning-type window, the Ludman Auto-Lok, goes a step farther in this respect. The bottom sash of the Auto-Lok window is designed to remain slightly open, while the upper sash are closed tight and automatically locked. This feature allows for night ventilation and limited ventilation during inclement weather.

BETTER VENTILATION...easier to clean

Because of their outward projection, the vents in aluminum awning windows provide maximum possibility of attaining 100% ventilation. While not all awning windows can be opened to nearly 90 degrees (almost straight out) the degree of their opening can be predetermined by checking the manufacturer’s specifications. In their wide-open position awning type windows can be cleaned from the inside. This very important maintenance factor cannot be underestimated. However, the basic design of the window must be checked. For, on certain of these types, where vents are pivoted on a fixed point, the top vent cannot be cleaned from the inside. The Ludman Auto-Lok window can be cleaned completely...all from the inside, top sash, too. This feature is accomplished by Ludman’s uniquely designed operating hardware, in which the hinge points of the top sash float down with the mechanism when the window is opened to provide a convenient 6” opening between the top sash and the window frame.

AIR INFILTRATION

Paradoxically, the use of aluminum awning windows has for many years been retarded because of their generally unsatisfactory performance on the score of tight closure and elimination of air infiltration. Yet, today, the tightest closing window ever made is an awning...
type window. This unit is Auto-Lok, developed by Ludman Corporation after many years of research. Its tight closing performance is made possible by its patented hardware, a self-locking device which automatically seals the window tightly when closed. Auto-Lok hardware provides a closure ten times tighter than the popular established standards for casement windows and projected sash. Pittsburgh Testing Laboratory tests reveal that air infiltration through a standard, assembly line Auto-Lok window amounts to only 0.095 cubic feet per minute...a degree of weather-tightness hitherto thought impossible in any window. Though the Auto-Lok locking action is exclusive with Ludman, other manufacturers are beginning to use a vinyl plastic weatherstripping material similar to that which Ludman uses to weather-strip the Auto-Lok unit.

SIMPLE OPERATION

The "one-hand" operation of aluminum awning-type windows is another feature that is very well accepted...and, in many instances, one of the important deciding factors in the selection of these windows. For example, this feature is important to hospitals, where busy nurses with a tray in one hand can still open or close the windows with their free hand...saving time and trouble. Each individual manufacturer utilizes a distinct type of operator to actuate the window operating hardware. Usually they have large gear boxes to generate the great amount of force required to actuate the torque bar window mechanism. Because of their size they extend over the face of the window sill into the room. Some have removable cranks and extension drives. A study of the operating hardware of all aluminum awning-type windows reveals the fact that Ludman, maker of the Auto-Lok Window, has the most efficient mechanism from the standpoint of easy operation and trouble-free service. The automatic, self-locking principle of the patented Auto-Lok operating device eliminates torque strain required to force the hinges in order to pull individual sash in tight against the frame. In fact, the Auto-Lok mechanism is so perfectly balanced and requires so little pressure that a child can operate the windows.

THE IDEAL WINDOW for any installation...in any climate

The aluminum awning-type window is practical from every standpoint. Installations all over the world, in all climatic extremes, have proven their practicability. Their attractive horizontal lines make them entirely adaptable to all types of architectural design from cottage to skyscraper. Their rapidly growing acceptance is having a marked influence on architectural designs because their clean horizontal lines fit admirably into modern architectural styles.
they handle peak loads with maximum efficiency and minimum maintenance

Peelle Counterbalanced Motorized Doors increase the carrying capacity of freight elevators as much as 20%. When peak load demands would tax the physical capacity of a manual operator, Peelle Motorized Doors and Peelle Vertical Sliding Car Gates open and close in one fourth the time of manually operated doors. This eliminates costly bottlenecks in busy plants, yet the cost of motorizing is but a small percentage of the total investment.

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Peelle Motorized Freight Elevator Doors assure safe, smooth operation and reliable performance. These doors are approved by the Underwriters’ Laboratories and the Factory Mutual Insurance Companies. They always carry the U. L. Seal.

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Edwin F. Guth, Sr., has given fifty years of his life to his work with almost religious devotion. His efforts have been rewarded.

His company, now celebrating its Golden Anniversary, is recognized as one of the leaders in the lighting industry. He has achieved fame for his contributions to the betterment of lighting. We at GUTH pause to honor this man who has shaped the past and future of our company.

Thanks, E. F. Guth, Sr. And thanks to all of you who have been so wonderful to us during this past half-century.
It's no mean trick to turn a problem into a bonus. But the owners and builders of New York City's new 27-story Sinclair Oil Building did it. Here's how.

Problem: because there was a bed of solid rock beneath Fifth Avenue and 48th Street, the cost of blasting for a sub-basement refrigerating plant for air conditioning would have been terrific. Solution: Carrier Absorption Refrigerating Machines chill water with steam by absorption. They have no major moving parts and are practically vibrationless. So it was practical to put them on the roof.

Bonus: Instead of long, costly condenser water lines, and pumps with extra horsepower and extra-heavy casings to withstand the hydrostatic pressure of 27 floors which an ordinary basement plant would have required, the roof-top installation used short water lines and pumps with standard casings ... a clear saving of some $25,000 on first costs alone!

Another bonus: the Carrier Absorption Refrigerating Machine handles extremely light loads automatically with high efficiency. This is mighty important in a year-round air conditioning system like Sinclair Oil's, where only a small amount of refrigeration will be needed during cool weather.

The Carrier Absorption Refrigerating Machine is built in five sizes, from 115 to 350 tons. Maybe it can help you turn a problem into a bonus, too. The nearest Carrier office will give you all the information you want. Or write for our folder, "Absorption Refrigerating Machines." Carrier Corporation, Syracuse, New York... for 50 years — the people who know air conditioning best.
To solve your "WALL-OF-ICE" problem... 
this NESBITT THERMAL BLANKET:

Architects who design and school officials who approve large window areas in the modern classroom may delight in their choice if thermal comfort has been considered. Unit ventilators could be selected by conventional standards if thermal comfort depended alone upon the classroom air temperature. But today we know that low-temperature exposures and cold window downdrafts may remain the robbers of pupil comfort, even in classrooms with close control of room-air temperature. The practical solution to the chilling effect of window downdraft is to release heat upward over the exposure.

For conditions of large glass area and cold outdoor temperature, Nesbitt provides Wind-o-line Radiation for integration with the Syncretizer. Wind-o-line consists of fin-and-tube radiation in a grilled wall-hung casing to extend from both ends of the ventilating unit for the full window length—and continued, if required, along cold outside walls. (Or it may be had as a component of the storage cabinets forming The Nesbitt Package.) Wind-o-line solves the problem of heat loss logically with a heat gain where and when needed. Convected currents of warm air temper the window downdraft and divert its flow upward and above the heads of the room occupants.


NESBITT Syncretizer WITH WIND-O-LINE

Wind-o-line Radiation may be integrated as part of The Nesbitt Package of Syncretizer and storage cabinets.
**BETTER MASONRY WALLS**

Despite the provision of an expansion joint, mortar expansion caused the failure of this snow-covered brick parapet wall.

**STEAM-PAK generators cut building costs**

When you specify Steam-Pak Generators for heating or steam generation in a new building, you immediately reduce cost of the building because you eliminate need for a high stack or chimney. A low vent is all that is required. You save much more than in building costs though—because Steam-Pak Generators are built to provide heat and process steam at efficiencies unattainable in standard boilers. This saving alone in many plants has paid off the cost of new equipment within a year. We invite you to write today for more details.

**Protection** of a wall during erection cannot be overemphasized. Rain-soaked walls will never be as satisfactory in performance and appearance as those laid with dry units and protected with weighted canvas covers. A good slogan is “deliver, store, lay and keep the units dry until capped by construction details.” This will eliminate many shrinkage strains, help prevent efflorescence, and help keep the work clean.

**Thermal variations.** Aside from movement induced by wet and dry weather, another climatic effect which often causes distress is thermal variation. Most materials expand with a rise in temperature. This expansion is proportional to the length of the wall, the maximum temperature differential and the coefficient of expansion. This thermal coefficient increases with the density of the assemblage. Thus extremely dense units when used with rigid, dense mortars expand much per unit of length, per degree of temperature rise. On the other hand, reasonably porous units laid in more elastic mortars have lower expansion coefficients.

When the over-all movement of a wall section reaches a critical value, expansion joints should be provided. If the wall is restrained by structural frames, great care must be taken to allow expansion to take place without inducing shears. This involves technical analysis (Continued on page 200).
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Specifically designed for control of low-voltage distribution circuits in commercial buildings, Westinghouse Building-Type Switchboards provide low-cost circuit protection with these advantages:

... Where Westinghouse Type AB Nofuze "De-ion" Circuit Breakers up to 600 amperes are suitable, these compact breakers keep cost and space to a minimum.

... Where circuit requirements are such that AB Breakers cannot be used, and for ratings above 600 amperes, stationary mounted Westinghouse Type DB Air Circuit Breakers are used.

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By merely inserting the track roller in the proper hole, the Raynor "Universal" Graduated Hinge may be used on any section of the door. Used with a tapered track, this amazing hinge automatically seals the door against the jamb or molding when in the completely closed position and automatically breaks the seal for a free-easy rolling door the instant the upward action is started.

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Stanley Magic Doors say "Glad to see you" and "Come again" with the grace and attentiveness of an honored host. Controlled by the "Magic Eye" (photoelectric) or "Magic Carpet", entrance and exit doors (service doors, too) open automatically on approach, stay open until all traffic has passed, then close quickly and silently — as if by magic!

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Architects, engineers, contractors — planners and builders of tomorrow — choose their materials with care. The quality of the completed job depends on them. And the specialists responsible for the successful, dependable operation of an air conditioning system pay strict heed to the proper selection of the air distribution equipment...the point where success is measured.

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Many architects are specifying Wascolite Skydomes to fulfill exacting lighting requirements for close work. The reasons of architect W. Henry Neubeck, Trenton, N.J., for using Skydomes in the Hamilton Township, N.J., postoffice, shown here, are typical:

"In the work space, we used five Skydomes in preference to two saw-tooth skylights as originally suggested by the Postoffice Department. The appearance is more pleasing, light distribution is improved, heat loss reduced and maintenance eliminated. By using Skydomes instead of windows, we also obtain the necessary privacy for this work."

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- The correct size, type, number, spacing and above-floor height of Wascolite Skydomes.
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Postoffice, Hamilton Township, N.J.; W. Henry Neubeck, architect.
when Beauty lets its hair down
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And in this fashionable salon, patrons often have a lot to say about the beautiful Flexachrome* floor.

Operators love Flexachrome's bright, rich colors, too...its smart appearance. And you should hear what they say about its resilience...its all-day foot comfort!

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Steering in is being in—when the doors are Tuf-flex* tempered plate glass. These crystal-clear glass doors are truly entrances—not barriers. They give the entrant a clear view of the interior. For your building, and its tenants, that can mean a dollar-and-cents difference. Tuf-flex doors are made tough to stand up to the traffic they invite. The \( \frac{3}{4} \)"-thick glass is tempered to a strength three to five times that of regular plate glass.

Tuf-flex doors are available in a variety of sizes, with handsome bronze or alumilited fittings designed to take standard pivot hinges and other builders' hardware.

Take a look at your doors now—do they look inviting? If they don't, take a look at the variety of Tuf-flex door designs your L'O/F Glass Distributor can show you. Or mail the coupon for your free copy of our Tuf-flex door booklet.

Libbey-Owens-Ford Glass Company
8842 Nicholas Building, Toledo 3, Ohio

Please send me a copy of your book showing uses of Tuf-flex doors, as well as your installation detail folder.

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Company:
Address:

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* TUF-FLEX
Tempered Plate Glass DOORS
MADE ONLY BY LIBBEY-OWENS-FORD GLASS COMPANY
8732 Nicholas Building, Toledo 3, Ohio
How many catalogs do **you** need when writing heating specs?

**When You Specify Dunham**—you need *just one*. You don’t have to wade through a *variety* of heating equipment catalogs to find what you want. Here’s why:

Dunham makes a *complete line* of heating equipment for residential, industrial, commercial and institutional buildings. Everything, from the simplest radiator valve to completely automatic, precision temperature control systems, is in *one catalog* arranged for quick specifying.

Specify Dunham, and all the responsibility is in good hands. For nearly half a century Dunham has meant top quality heating performance. Specify Dunham and *you* get client satisfaction.
This Dramatic Litecraft Fixture (#512) actually "angles" illumination, projecting sharp highlights and unusual dramatic effects.

ACCENT combines a 43 degree tilt with a 360 degree rotation. Standard Finish: Satin Chrome.

Available in Satin Bronze, Satin Brass and Satin Copper and other special finishes at slight additional cost. Also available for top access in high ceiling installations. Litecraft is the largest manufacturer of recessed adjustable ceiling accent lights.
BETTER MASONRY WALLS

Three steps in preparing a proper joint: 1) excess mortar is cut flat, 2) mortar is allowed to become thumbprint hard, 3) mortar is compressed with cylindrical tool \( \frac{3}{4} \)" larger in diameter than the joint, thus compensating for mortar shrinkage.

CAST IRON PIPE

This modern apartment building is but one of countless structures of all types throughout the country for which Clow (threaded) Cast Iron Pipe has been selected. It was chosen because of its lasting corrosion-proof qualities which assures a useful service life of more than a century.

More and more architects and plumbers are turning to Clow Cast Iron Pipe for 3 to 10 inch downspout, waste and vent piping since it has such superior qualities and its 18 foot lengths can be installed faster and therefore more economically.

Critical characteristics of masonry units are their absorption, dimensional stability and strength—all of which have great influence on the success of a wall.

If the units are of a type that expand and contract with each wetting and drying, the usual practice of wetting them before laying will aggravate disruptive stresses after laying and cause efflorescence. When units are laid after expansion by wetting and heat, lower humidities and lower temperatures will produce a cumulative strain which is certain to open up vertical joints. If sufficient water movement is present, most units and mortars will effloresce. Use of dry units will insures less efflorescence, particularly if the face of the wall is properly pointed and the mortar and units are compatible. However, laying units dry requires a mortar which has a high flow after suction—in other words, a mortar which resists the extraction of water and possesses what is called antibleeding properties.

No wetting is required for units with an absorption of less than 15%. On the other hand, units with excessive absorption should be carefully and uniformly wetted—a difficult task which poses the possibilities of efflorescence.

A masonry unit with a high rate of total absorption will remove more water from the mortar than a unit with a low rate. This characteristic must therefore be considered simultaneously with the mortar specification. On the other hand, a unit which has too low a rate of total absorption will cause water gain at the unit-mortar interface and impair intimacy of contact and eventual bond. Somewhere between these two extremes lies the proper unit and mortar. It has been my prac-

(Continued on page 204)
Does Far More...Yet Costs No More
than ordinary sheathing, applied!

"Tug of War" Test Proves
Greater Bracing Strength

As the turnbuckle was tightened, note how the Celotex Insulating Sheathing panel remained plumb—while the panel of ordinary sheathing was distorted. Now you see why Celotex Insulating Sheathing builds a better, stronger wall at lower cost! Why it belongs in your specifications!

CELOTEX INSULATING SHEATHING
does several jobs at one cost

Applied (that's the only way to figure true cost), Celotex Insulating Sheathing costs no more, and usually less, than ordinary sheathing. Yet it gives you far more.

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4. DOUBLE-WATERPROOFED. Inside, by integral treatment that coats every fibre; outside, by asphalt coating on both surfaces and all edges. Yet it has over twice the vapor permeability required by government agencies!  
5. IT'S THE ONLY SHEATHING made of tougher, stronger, long Louisiana cane fibres—and protected by the patented Ferox® Process from dry rot and termite attack.  

Count up the savings and advantages, and you'll agree: Celotex Insulating Sheathing is the key to more comfortable, more enduring homes at lower cost. That's why it's being specified by more and more architects all over the country. Write for free booklet giving full data. The Celotex Corp., Dept. MB-42, 120 S. LaSalle St., Chicago 3, Ill.

For better homes...specify genuine

CELOTEX BUILDING PRODUCTS

Quick, low-cost way to build "the Ideal Wall"

Celotex Insulating Lath insulates as it forms a strong, solid, continuous plaster base that reduces danger of plaster cracking. Used in combination with Celotex Insulating Sheathing, it gives you "the Ideal Wall"—a better, stronger wall with BUILT-IN insulation. Write for complete information today.

The Celotex Corporation
120 S. LaSalle Street
Chicago 3, Illinois
Bids on alternate designs
show reinforced concrete saves 6.76%
... cuts steel requirements 50%

In planning this 616-unit public housing project, the Buffalo, N. Y., Municipal Housing Authority ran exhaustive cost studies to determine which type of building frame would be less expensive—reinforced concrete or structural steel. Costs for the project had to be estimated closely, before appropriations could be made.

Engineers of the Housing Authority prepared a complete floor and column design for one building—for both structural steel and reinforced concrete. In addition, a separate structural steel design was prepared by an outside engineer. Then all three designs were submitted to contractors for preliminary pricing.

The results are shown on the opposite page. Reinforced concrete won hands down. It offered a clear saving of 6.76% of the general contract cost, or $270,038.00! Furthermore, reinforced concrete used 2,350 fewer tons of steel, urgently needed for national defense.

Savings like these are typical of those realized by builders all over the country with reinforced concrete. And reinforced concrete is not only economical. . . it is inherently firesafe, and provides a permanent rugged structure which is highly resistant to wind, shock, and quakes.

On your next structure, design for reinforced concrete!

ARCHITECTS: Beckus, Crane & Love;
MECHANICAL ENGINEERS: Beman & Candee;
STRUCTURAL ENGINEER: James N. De Sorio, P.
saved...

$270,038.00

AND 2,350 TONS OF STEEL

BY BUILDING WITH

REINFORCED CONCRETE

COSTS PER SQUARE FOOT  (Preliminary Designs)

<table>
<thead>
<tr>
<th></th>
<th>Concrete Frame</th>
<th>Steel Frame Design #1</th>
<th>Steel Frame Design #2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineer's Estimate</td>
<td>$1.825</td>
<td>$2.335</td>
<td>$2.302</td>
</tr>
<tr>
<td>Contractor A, N. Y. C.</td>
<td>1.68</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contractor B, N. Y. C.</td>
<td>1.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contractor C, Buffalo</td>
<td>1.945</td>
<td>2.499</td>
<td>2.41</td>
</tr>
<tr>
<td>Contractor D, Buffalo</td>
<td>2.178</td>
<td></td>
<td>2.053</td>
</tr>
<tr>
<td>Contractor E, Buffalo</td>
<td>No estimate, but stated concrete was cheaper</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SAVING IN FRAMING COSTS

Low structural steel estimate ... $2.053 per sq ft
Low concrete estimate 1.680
Saving ... 0.373

For 616,644 sq ft of supported floor area:
Saving in framing costs ... $230,008
Saving in brickwork ... 28,030
Saving in plaster, partitions, etc ... 12,000
Total indicated saving ... $270,038

CONCRETE REINFORCING STEEL INSTITUTE
38 South Dearborn Street, Chicago 3, Illinois
BETTER MASONRY WALLS

tice to limit the cold-water absorption of face units to from 4% to 10% and to allow a maximum cold-water absorption of 15% for backup units. Units which have higher absorption can be used, but with care.

Dimensional stability of a masonry unit is also extremely important. In this regard clay units are far superior to concrete units. Curing and drying shrinkage of concrete units are responsible for many wall failures. Because these units are made in many shapes, many plants utilizing many diverse techniques, their curing, aging, water content and homogeneity vary widely. If laid in a wall while relatively green and wet, the ordinary 8 x 8 x 16" concrete block may shrink during the first few months as much as 1/16" in length—equivalent to a coefficient of shrinkage of about .004" per in. The resultant tensile stress imposed upon the vertical joints and upon the block is inordinately high—much more than the bond strength of the mortar and even the tensile strength of the concrete in the block.

Mortar. Many investigators have blamed the mortar for most of our troubles with masonry walls. No one can deny that mortars must provide integrity and aid in producing weather resistance. Much depends upon the bond produced and the capacity of the mortar to offset some of the troublesome basic characteristics of the units. It is therefore important to make sure that the mortar has the ameliorating characteristics necessary to form a sound wall.

All mortars are a combination of well known cementitious materials, sand, water and sometimes some admixture. Including Portland cement, natural cements, slag cements, hydraulic limes, limes, or combinations of two or more of these, these cementitious materials each contribute certain characteristics to a mortar:

- Portland cement produces higher strengths and more brittle interfaces, induces bleeding and has a lethargic response to wetting and drying movements. It also arrives quickly at a stabilized state of solution and gel structure without the capacity of reconstitution.
- Natural cements are more elastic and have characteristics of reconstitution, but have great variations in composition because they come from rock which has great natural variations.
- Slag cements are sometimes in much the same category as Portland and at times resemble the behavior of natural cements, except that they are usually controlled in their composition.
- Hydraulic limes combine some of the gel-forming characteristics of the hydraulic materials but also possess the reconstituting capacity so necessary to successful mortar performance. A bit lower down the scale in strength, they nevertheless possess other highly desirable characteristics. Thus, the designer must choose between strength and watertightness.
- Ordinary limes possess to an even greater extent these characteristics of reconstitution. They reduce the compressive strength of mortar but materially increase its bond and resiliency.

This complex situation has resulted in some marketed cements of doubtful efficacy in mortar. While they meet standard specifications for strength and for other characteristics—which in themselves are compromises with scientific facts—they fall far short of proper performance. Therefore, no one ought to use any bagged material, whatever its name, unless he is certain of its composition, i.e. unless its basic constituents are printed on the bag.

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 New Continuing Education Building at Michigan State College... a part of the new 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.
- Read the articles on this building. Then you will know why you can rely on Van for your food service equipment as has Michigan State on previous occasions, too.
A lesson FROM SEARS ROEBUCK

What Sears Roebuck's catalog does for many a farmer, "Ruberoid Bonded Built-Up Roofs and Flashings" does for architects and builders. It's a complete reference catalog that simplifies selecting and applying the right roof every time.

George Dahl, Dallas architect, used this handy book to pick the ideal roof for Sears Roebuck's new Houston store. Situated in the North Shepard section of booming Houston, this modern store combines efficient store operation with maximum customer convenience. And the 4-ply tarred felt and coal tar pitch Ruberoid roof combines efficient application and maintenance with maximum protection from the hot Texas sun.

Through over half a century of experience, Ruberoid specialists have developed tested specifications to cover every type of roofing problem.

You, too, will find a ready answer to your next roofing problem by consulting "Ruberoid Bonded Built-Up Roofs and Flashings." If you don't have a copy, we'll be happy to send you the new edition without charge. Just drop us a note on your letterhead. Or refer to Sweet's Architectural Catalog 8A/RU. The Ruberoid Co., 500 Fifth Ave., New York 36, N.Y.

THE RIGHT ROOF FOR ANY JOB — FROM ONE SOURCE

Ruberoid makes every type of built-up roof — Smooth Surfacéd Asbestos, Coal Tar Pitch with gravel or slag surfacing, and smooth or gravel-and-slag surfaced Asphalt... in specifications to meet any need. Ruberoid Approved Roofers are not prejudiced in favor of any one type. You are assured of centralized responsibility, smoother operation, uniform quality with Ruberoid built-up roofings.
ODDS ARE THIS* WILL BE YOUR NEXT BIG PROBLEM:

SELLING

* Perhaps it already is

Maybe you don’t think of yourself as a salesman. (You’d better begin to!)

Maybe a sales staff works for you. Or maybe a Sales Manager works for you. (Better start thinking, hard, about how hard he and his men are selling)

Because whatever your business, whatever your job, you will almost surely have more need for selling as the year grows older.

U.S. production is topping all previous peaks. But, as defense-buying tapers off this year, you and your firm and all Industry will be caught short unless you turn your attention start thinking, hard, about how hard he and his men are selling.)

They are not writing a “how to do it” series (in the ordinary sense of the phrase). What they are doing (for the first time on this scale in their twenty years of publishing) is to apply to the great, lore-laden subject of selling their peculiar and special talents as first-rank business journalists with unique experience in their trade.

For these reasons, the editors of FORTUNE are devoting a major part of the text in their next ten issues to a series of searching articles on “Selling in Today’s Economy.”

You have probably read a great deal on the subject, much by men who call themselves “experts” in this quasi-science, all written from some point-of-view in the remote or recent past.

This FORTUNE series has little if anything in common with other things on Selling you have read. The editors of FORTUNE are not specialists in selling—nor do they pretend to be. They are not writing a “how to do it” series (in the ordinary sense of the phrase). What they are doing (for the first time on this scale in their twenty years of publishing) is to apply to the great, lore-laden subject of selling their peculiar and special talents as first-rank business journalists with unique experience in their trade.

In the course of these ten articles, the editors will marshal and report many techniques and procedures of selling as they are used and employed by companies of all kinds all through our economy today. Since you cannot read about the way knowledgeable people conduct their businesses without learning a great deal to apply to your own business, these articles might after all be called a “how to do it” series.

But they make no judgments. They do not recommend ways of selling—methods of compensation for sales—retirement policies or distribution set-ups. They report, with a clarity and understanding unapproached by any other group of journalists writing about business today, on what many companies of considerable stature and reputation all through the American economy are doing and thinking about the subject of selling.

The first report appears in FORTUNE’s April issue. It will be called “Why do People Buy?” and it will not be “easy” reading. It sets the stage for what will follow—and may well be a mind-stretching exercise for many a reader. The following articles will get highly specific, will probe and expose such areas as:

- Is the social taboo against salesmen growing?
- Can retailers be turned into merchants?
- The secrets of the Ivy League of Selling (capital goods)
- How to keep a salesman . . . . . happy
- How much is the science of merchandising replacing the art of selling?
- Is “Market” research really research?
- Are small companies outbidding big ones for top salesmen?
- How effective is advertising?

This series on Selling is in addition to all the stories on distribution FORTUNE has already published and will continue to publish. Through this series, you’ll get a special no-holds-barred look at the selling procedures, good and bad, of many specific companies. All can suggest to you alterations in your own sales-thinking, in preparation for the great selling crisis that almost surely lies ahead.

Invest in yourself—subscribe to FORTUNE today by mailing the coupon

The series on “Selling in Today’s Economy” will continue all through your FORTUNE subscription—if you subscribe today. And, whatever problems arise in your business life during the next 12 months—you will be able to meet them more knowingly with the help of the unmatched information, ideas, stimulus you’ll gain from reading FORTUNE—every month.

For every month, you’ll find in FORTUNE the essence of the fast-paced, epic story of our industrial civilization—deeply probed, organized, beautifully presented. For example, the monthly Business Roundup is the best-based short and long range look ahead in type today. Labor brings you the best labor reporting available anywhere—and other departments keep you up-to-date on essential, provocative news about New Products and Processes, People and Technology. These features add continuity to the definitive articles of venture and adventure, in-and-about Business, which are the long-famous foundation of FORTUNE’s continuing story.

And always you’ll find FORTUNE filled with creative raw-material you can use to spark your work, your conversation and your progress.

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Editorial & Business Offices, 9 Rockefeller Plaza, New York 20, N.Y.

TO: FORTUNE Subscription Service, Kittredge Bldg., Denver 2, Colo.

Send me FORTUNE each month for the next year, beginning with the April 1952 issue with the first of the Selling series. This coupon entitles me to an introductory rate of $10. (FORTUNE is regularly $12.50 a year, $1.25 a copy.)

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THE MAGAZINE OF BUILDING
ARCHITECTURAL IDEAS WITH ENDURO STAINLESS STEEL

ENDURO is fertile with functional and decorative building ideas. It offers so much to the architect—handsome, striking effects . . . beauty that outlasts the years . . . resistance to rust and corrosion . . . ease of cleaning . . . client enthusiasm. Among the strongest of commercial metals, ENDURO can be used in thin weight-saving sections. It is readily workable; skilled fabricators are to be found everywhere. Here you see ENDURO creatively adapted to a handsome sunshade. Where will you use it next? . . . in curtain walls? . . . in building fronts? . . . in doors? . . . for flashing? . . . or, in a completely new and exciting way? You’ll find more details about ENDURO in Sweet’s . . . and for special help in developing your own ideas, write:

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See Sweet’s for data on Republic Pipe, Sheets and Roofing...Electrunite E.M.T...Fretz-Moon Rigid Steel Conduit... Berger Lockers, Bins, Shelving and Cabinets...Truscon Steel Windows, Doors, Joists and other Building Products.
Corridor in Rego Park Apartments, New York area, decorated with Wall-Tex. Kelly & Gruzen, architects.

why Wall-Tex is a wise investment for Rego Park Apartments

Seventeen 6-story buildings, housing about 800 families — and the walls on all floors are decorated with Wall-Tex fabric wall coverings. Dorothy Draper, Inc., Interior Decorators, chose Wall-Tex for its color-and-design beauty and its unmatched service features.

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installed by Gallagher & Speck, Inc.

Photos by Torkel Korving

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Frank Lloyd Wright on architecture . . .
Elwyn E. Seelye on civil engineering . . .
R. C. Reese on concrete design . . . John Lindsey on Wren . . .
Giulio Argan on Gropius

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WRITE for information on the complete line of Marlo comfort-conditioning equipment.

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AMERICAN PEOPLES ENCYCLOPEDIA YEAR BOOK, 153 N. Michigan Ave., Chicago 1, Ill.
576 pp. 6% x 9%. Illus. $10

There are two good reasons why the 1951 edition of this Encyclopedia Yearbook is of more than usual interest to architects: two top-flight architects are included among the contributors.

Richard J. Neutra, discussing trends in home construction, compares residences of the "My House, My Castle" era with today's compact "self-service" houses with their myriad contraptions, devices and gadgets which simplify their design and upkeep.

On the broader subject of architecture, Frank Lloyd Wright writes in a style as imitable as his architecture. Because they are brief, provocative and dangerous to excerpt, Wright's comments are presented below in their entirety:

"The Renaissance in Europe—"a setting sun all Europe mistook for dawn"—was imported by free America to bring architecture up to the level of a democratic civilization dedicated to freedom.

"But the spirit of Architecture was dead. Human thought had found the printed book. The other arts had fled. Printing was the Machine. In spite of sporadic attempts at 'rebirth' by special kinds of abortion, the ancient forms of architecture could only be outraged by the Machine.

"Meantime the Machine became the monstrous power that moves us now. By way of it, all-out timely materials, like glass and steel, came to hand as a great new means of building. But there were no architectural forms suited to their use. The practice of architecture was so far gone to the composer of the picture that we had no architects able to conceive the radical new forms needed to use the new tools and materials with nobility, inspiration, or even intelligence. So our own architects in this new world further falsified ancient symbols and again prostituted the new materials not only by a kind of mimicry but by mechanical outrage that made our architecture what it is today—servile, insignificant refuse or puerile nostalgia.

"When I speak of architecture as organic I mean the great art of structure coming back to its early integrity: alive as a great reality.

"What forms shall buildings now take if the glory of the great edifice is to come back to man again and he be blessed with the great beauty of truth in the way of his life we call his environment: so meretricious, so inappropriate now?

"How is the sap of human life which we call culture—escaping from autocratic mon­archy to democratic freedom—going to establish itself?

"It was evident long ago that we must no longer picturize, compose, or in any way pretend. We must conceive and integrate. Be-

(Continued on page 216)
SHOCK ABSORBERS
To eliminate water hammer in pipelines.

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Inlets, outlets, gutters, overflows and recirculating fittings.

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Josam's leadership in the plumbing drainage field didn't just happen. For almost 40 years, Josam has not been content to follow, but has been continuously pioneering and developing new products that have become the standard of the industry. Why not take advantage of this experience and take the "worry" out of your plumbing drainage installations. Do as the majority does—to be sure, get Josam! Use coupon below for helpful literature.

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Lower bids and more jobs... that's what using 3M Ceramic Tile Adhesive means to architects, builders and contractors! Tile goes on so much easier and faster that you can save up to 20% on a tile job... and pass the savings on to your customers.

The light weight of 3M Tile Adhesive makes it ideal for dry-built walls as well as conventional mortar-plaster walls. In remodeling jobs, existing walls easily support the weight of adhesive-set tile. And the quick curing time of 3M Tile Adhesive allows newly tiled rooms to be used the next day.

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Send today for a sample of 3M Ceramic Tile Adhesive #10, and also for specification and data sheets covering the description and use of CTA #10. Write 3M, Dept. 144, 411 Piquette Avenue, Detroit 2, Michigan.

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POWER EXHAUSTER

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From the First Colonial Settlements to the National Period

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Each style is described in text and pictures, with special emphasis on its regional characteristics and the conditions and influences from which it grew. Nearly 500 photographs and line drawings of interiors, plans and exteriors make it possible to study each building in detail. Professor Morrison has organized an extensive body of information into a concise survey of both the stylistic and the practical aspects of colonial architecture.

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"Organic building is natural building so organic architecture is the right answer. Construction again proceeds harmoniously from the nature of a planned or organized inside outward to a consistent outside.

"The space to be lived in is now the core of any building and in terms of space we find the new forms we seek. Or lose them. The old order called "classic" is therefore reversed and, where so many of our basic materials are wholly new, we are searching again for the natural way to build appropriate to the unprecedented life now to be lived in them. Our modern advantages should not continue so disadvantageous as they are becoming.

"That we be enamored of the negations brought by the Machine may be inevitable, for a time. But I like to imagine this novel negation to be, as I have used it,—only a platform underfoot to enable a greater splendor of life to be ours than any known to Greek or Roman, Goth or Moor. We should know a life beside which the life they knew would seem not only limited in scale, narrow in range but pale in richness of the color of imagination and integrity of spirit.

"As the matter stands, the pallor is ours and the shame. The giant leverage the Machine might be for human good may fail in its own weight from helpless, human hands, far short of our hope.

"Spirit only can control it but Spirit is a science Mobocracy does not know and Democracy must motivate.

"Our American architecture has become no work of art at all but, at best, a technical makeshift. Buildings more than ever are a mere piece of property. As for kindred 'production' our big industrialists are so busily 'streamlining' standardizations that we have been not only compelled to see some egregious makeshift touted, passed along as creation, but also to see superficial effects instead of causes finally accepted as euthenics by the 'higher education' and the officialdom it must please in order to live at all.

"Restlessly, we as a tirelessly exploited—and in turn exploiting—people must find some kind of release.

"Lacking refreshment for whatever native love of beauty the god of the creative impulse may have passed along to us by nature, we turn to Organic architecture. As preceding generations found symbolism and empty pretensions called monumentality, so we find refreshment in rejection of shoddy sensationalism and new-fangled invention or the novelty of superficial beautifications by the commercial 'designer.'

"These are really no higher than those of the professional beauty parlor or a cigarette
FOR THE LINCOLN ELECTRIC PLANT...

FIBERGLAS* Roof Insulation

It's low in thermal conductance

It's long lasting... It's Economical

<table>
<thead>
<tr>
<th>JOB DATA ON ANOTHER FIBERGLAS INSULATED ROOF</th>
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<tr>
<td>Building: Lincoln Electric Co. ................. Cleveland</td>
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<tr>
<td>Design and Construction: The Austin Company ... Cleveland</td>
</tr>
<tr>
<td>Year of Completion: 1951</td>
</tr>
<tr>
<td>Type of Deck: Steel</td>
</tr>
<tr>
<td>Type of Built-up Roof: 4-ply tar and gravel</td>
</tr>
<tr>
<td>Insulation: Fiberglas Roof Insulation, approximately 750,000 sq. ft.</td>
</tr>
</tbody>
</table>

Low Thermal Conductance—When you specify the heat conductance required for roof insulation you make unmistakably clear the degree of heat protection you wish. We'll gladly certify to the low “C” values of Fiberglas Roof Insulation as shown:

<table>
<thead>
<tr>
<th>Thickness:</th>
<th>1/2&quot;</th>
<th>3/4&quot;</th>
<th>1&quot;</th>
<th>1 1/4&quot;</th>
<th>1 1/2&quot;</th>
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<tr>
<td>Conductance</td>
<td>.50</td>
<td>.33</td>
<td>.25</td>
<td>.20</td>
<td>.17</td>
<td>.13</td>
</tr>
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</table>

Long Lasting—Will not rot or decay, swell or shrink—fibers of glass are unharmed by possible dampness. Will not deteriorate from exposure to either the elements or normal roof traffic. Durability and low maintenance costs are assured.

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Basketball Coach

Adolph Rupp, University of Kentucky

HUNTINGTON LABORATORIES, Inc.
Huntington, Indiana
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University of Kentucky Fieldhouse

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WREN, HIS WORK AND TIMES. By John Lindsey. Philosophical Library, New York, N.Y. 256 pp. 8¼ x 5¼". Illus. $6.00

Neither biography nor treatise, this narrative outlines Wren's life (as an astronomer, atomist, scholar, scientist, politician and

(Continued on page 224)
In this recently-built residence for young divinity students, Pratt & Lambert job-tested colors help to create an atmosphere conducive to spiritual study as well as home-like living.

This employment of color for both decorative and functional purposes, was effected by using Pratt & Lambert Paint and Varnish throughout the building.

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The door illustrated is a heavy, 5-section, power-driven vertical lift door — built heavy enough for roughest usage... constructed for complete weathering and service.

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BOOK REVIEWS

architect) and his work with major emphasis on his crowning achievement—St. Paul’s Cathedral.


Somewhat comparable in purpose and format to Architectural Graphic Standards, these two volumes plus the unrevised third volume (1947) on Field Practice are valuable props for the civil engineer and contain much useful data for architects. Volume I’s prime purpose is to furnish the engineer with “sufficient data so that he could design any civil engineering work without other reference books.” Volume II includes sample specifications for nearly every type of building and heavy construction, plus “cost figures for all labor, materials and other factors involved in construction work and a method for keeping them continuously up to date.”

MOUNT RUSHMORE, By Gilbert C. Fite. University of Oklahoma Press, Norman, Okla. 5 1/4 x 8 1/4”. 27 pp. $3.75

This is the story of the Mount Rushmore National Memorial—the “four faces” carved in granite in the Black Hills of South Dakota—the “most flamboyant attempt ever made by man to preserve his heritage for future generations.”

THE ART NOUVEAU, By Henry F. Lenning. Martinus Nijhoff, 9 Lange Voorhout, The Hague, Netherlands. 8 x 11”. 143 pp. 21 guilders

This is devoted to the style which brought the pictorial arts as well as architecture and the related arts out of the lingering romantic tradition of the 19th Century. It deals with the importance of the style as an indispensable bridge to organic construction and interior design.


An illuminating discussion on the functions of sculpture, poetry, painting, music, drama and architecture, and their possibilities for the enrichment of life.


A profusely illustrated discussion (in Italian) of Gropius’ work up to and including the Harvard dormitories.

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To be useful today, school kitchens must be modern—must be adapted to the changes in teaching methods. Kitchen Maid is a pioneer builder of kitchens for schools, apartments, institutions, homes. For more than 30 years it has been solving the problems of school installations—keeping pace with educational developments. Kitchen Maid kitchens will be found in schools and colleges throughout the country. Kitchen Maid dealers are well trained and experienced in school work. And Kitchen Maid cabinets, soundly built of hardwood are uniquely suited to the demands of school service. Choose Kitchen Maid equipment for your next school project. Call your dealer, or write the factory.

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at right—Young hands and young minds are now trained in modern home-making techniques in this modern Kitchen Maid kitchen.

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FITCHBURG, MASSACHUSETTS
PLASTIC-FIBER STRUCTURAL PANEL has
corrugated core fused between faces

The big construction news to come out of last month's Plastic Industries Exposition in Philadelphia is the **Kerr Panel**. A low pressure laminate, the lightweight panel is one of the few building materials which exploit plastic's molding possibilities.

In the processing, the panel's reinforcement serves as the skeletal mass for the final shape. A thin (1/16") glass fiber mat crimped into 16 corrugations 3" deep is sandwiched between two flat 4' x 8' fiber mats. The three layers are then pressed between heated platens and impregnated with pigmented polyester resin. Off the press comes a 60 lb. monolithic structural panel with high compressive, tensile, and flexural strength.

Incombustible, insectproof, and corrosion resistant, the **Kerr Panel** is being used for interior partitions, demountable prefab buildings and walk-in refrigerators. (K factor for the 3 3/16" thick panel is .15; it may be brought down to .09 by slipping preformed insulation inside the corrugations.) It is suitable for outside walls and, used as flooring, has a safe working live load of 25 lbs. per sq. ft. on an 8' span. It may be sawed, drilled and routed with band tools and can be furnished with curved sides or ends. Special tongued and grooved fittings for joining the panels are available. Since color is fused into the material during fabrication, no additional finish is required. Translucent white is the standard color but the panels will be made in almost any shade specified. Prices range from about $1.75 to $2.30 per sq. ft., depending on quantity purchased. Current plant capacity is 200,000 sq. ft. a month.

**Manufacturer:** Alexander H. Kerr & Co., Inc., Kerr Panel Div., 2950 Winona Ave., Burbank, Calif.
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SPEC-LESS SPECTRE
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This architect forgot to specify the proper panelboards to control lighting in his project. While other buildings are used 'round-the-clock without trouble, his frequently have lighting difficulties. This haunting annoyance could have been avoided by specifying a modern circuit breaker panelboard.

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You provide 3 extra-quality features when you specify

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5/8 inch throw insures secure locking even on doors that shrink or warp!

for extensive master-key systems the Corbin master-ring cylinder doubles the number of possible key changes!

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In heavy traffic areas, the steel plate gives concrete flooring additional wear resistance.

**PRODUCT NEWS**

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*Manufacturer:* Acme Steel Co., 2840 Archer Ave., Chicago 8, Ill.

**SLOTTED STEEL ANGLE used for constructing plant equipment**

Industrial accouterments—from scaffolding, partitions and cabinets to benches, handrails and hatracks—may be assembled with *Dex-Angle* fabricating units. An erector set grown up, the 10' slotted-leg galvanized steel angle is put together with bolts and a wrench. No drilling or welding, or special brackets, clips or hooks are necessary. Equipment may be constructed, altered, and dismantled easily and rapidly, and the *Dex-Angle* are completely salvageable. Small indentations every 3” along the angle simplify measuring and accurate cutting.

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(Continued on page 234)
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The new **SCR** Insulated Cavity Wall is the latest development in masonry construction.

It is insulated with Fiberglas Cavity Wall Insulation—Pouring Type, specifically developed by Owens-Corning Fiberglas Corporation for this particular wall.

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"Z," "T," "I," and box sections. Ten 10' angles packaged with 75 nuts and bolts sell for $20. In quantities of 50 or more packages, the price is $17.60. Accessory steel panels 3' long and 6" wide with 1" flanges are made for use as shelving. Each panel will support 300 lbs. Casters are also available for portable bins and hand trucks.

Manufacturer: Acme Steel Co., 2840 Archer Ave., Chicago 8, Ill.

### Rubber Sandwich: Gym Walls with Bounce

Hard surfaced gymnasium walls have caused many serious injuries. A fatal accident in a Connecticut school spurred a local manufacturer into research on a resilient wall. A structural crash pad, Spongex Safety Cushion Wainscotting, is the result of that study. The new panel consists of a 2' x 6' x 5/8" plywood sheet to which are bonded a 5/8" layer of rubberized curled animal hair and 3/8" of soft cellular rubber. (Both spongy layers are compressed to a 1" thickness before lamination for added resiliency.) A strong vinyl sheeting with a mottled green finish is drawn over the sandwich and stapled to the plywood backing. To provide the air relief necessary for efficient cushioning, six 1" portholes are drilled in the plywood. The panels also are good sound deadeners for the athletic exuberances on the court.

They are supplied with 4 metal clips for easy attachment to horizontal furring strips. A 1/4" baseboard with a rabbet along the inside top edge may be constructed to serve as a bottom rail. A wood "L" top rail with inside dimensions of 1 1/2" x 2" may be built to cap the panels. The price of the wainscoting is $21.25 per section.

Manufacturer: The Sponge Rubber Products Co., Shelton, Conn.

### Stainless Steel Made with Noncritical Alloy

To help conserve the short nickel supply, Allegheny Ludlum has developed a technique for large scale fabrication of stainless steels alloyed with manganese and chromium. Known in the laboratories for many years, these steels are now available commercially. They are reported to be suitable alternates for 18-8 chromium nickel stainless steels in applica-

(Continued on page 236)
Penta protects wood in VA hospital

Over one hundred thousand board feet of lumber for the John B. Cochran Memorial Hospital, being built in St. Louis by the Veterans' Administration, will be protected by penta preservative.

Thirty-five thousand board feet of lumber used as subsills below windows was pressure-treated to retain 6 pounds of penta preservative per cubic foot. Outside doors, sash, frames and 1,350 outside windows were dip-treated with penta. Penta now is named in more than 50 government specifications.

Monsanto Penta (pentachlorophenol, technical) is a stable chemical produced specifically for wood preservation. It protects against termites and other wood-boring insects. It prevents decay due to fungi. Penta does not leach... does not wash away in rain or ground water. Treated with properly formulated Monsanto Penta, wood can be painted or varnished.

For information on the use of Monsanto Penta, which gives wood durability sufficient to replace hard-to-get steels in many applications, contact the nearest Monsanto Sales Office or write MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1752-C South Second St., St. Louis 4, Mo.

PRODUCT NEWS

...where high corrosion resistance is required.

RESIN VARNISH is fast-drying sealer for concrete floor surfaces
For concrete floors subjected to heavy wear in factories and warehouses, Rex is producing a new sealing compound, Concrete Glaze. This fast-drying clear varnish seals the pores of concrete with a tough durable coat which is said to have excellent resistance to acids, alkalis, grease, oil, water and steam. It may be brushed or sprayed, and the floor can be walked on less than four hours after finishing. It can be used for exterior applications as well as inside jobs. Price is $3.95 per gallon in 5 gal. pails.
Manufacturer: Rex Home Supply Co., 142 S. Highland Ave., Ossining, N. Y.

10-point FIRE PROTECTION always starts with
A SURVEY OF NEEDS!

Adequate fire protection is as important to the buildings you design, erect or manage as your physical well-being is to you. What would you think of your doctor if he diagnosed and prescribed treatment without making an examination? On a similar basis, fire protection equipment cannot provide complete safety unless the specific needs are pre-determined and the system engineered to the exacting requirements. That's why the first point in "Automatic" Sprinkler 10-Point Fire Protection is "JOB SURVEY and ENGINEERING ANALYSIS . . . detailed to meet individual needs."

WARP RESISTANT SLIDING DOORS made with new wood laminate
One of the first fabricators to utilize U. S. Plywood’s Novity (Dec. issue ’51) in a building product, National Door Co., is making low priced sliding doors with the wood waste wonder material. Two- and three-panel Slidoor units are available 6'-9½" and 8' high for openings from 2' to 12' wide. The doors glide noiselessly on ball-bearing rollers, and adjustable rear slide guides compensate for any inaccuracy in header height. The unit’s construction, combining hardwood frame with the lightweight laminate board doors, is said to assure exceptional dimensional stability. A 4' x 6'-9½" two-panel model sells for $25.
Manufacturer: National Door Co., Kenilworth, N. J.

KNOCK-DOWN STEEL DOOR FRAME is slim counterpart to flush door
Kewanee’s prefab steel door frame, designed for all 1¾" and 1½" interior doors, is priced for low cost housing projects. Selling for about $6.50 to $8 (depending on quantity purchased), this slim trim affords the builder savings in labor as well as initial cost. The frame is primed at the plant with a corrosion resistant aluminum coating and packaged in three parts—the top and two sides. Nail holes are prepunched every 7" along the frame flange for attachment to the subframe—a rigid fastening method said to prevent vibration. A small space is allowed for laying the finished floor under the frame; thus the time spent cutting the floor around the jamb contour is eliminated. Another of the frame’s features is its recessed edge (designed for both plaster and wallboard construction) which acts as a plaster ground so that no temporary stops are needed. Receses also are provided in the jambs for standard 3½" x 3½" butt hinges.
Manufacturer: Kewanee Mfg. Co., Kewanee, Ill.

(Continued on page 240)
Perpetual cleanliness in rest rooms of an ultra-modern skyscraper is a must. Immaculate cleanliness is no problem where plumbing fixtures are off the floor, because there is nothing to interrupt the sweep of the broom and the swish of the mop. Fixture-Bare Floors reduce the day-by-day dollar cost of maintenance to an all-time low, while lifting sanitation to a new high. The New Way of building utilizes wall type plumbing fixtures throughout, installed the Zurn Way—the simple, safe way of installing wall type closets, lavatories, sinks, and other fixtures. This New Way saves time and labor, reduces the use of building material and protects rest rooms from premature obsolescence. Specify wall type plumbing fixtures installed with Zurn Wall Type Closet Fittings and Carriers. Write for booklet entitled, "You Can Build It (Cubic Foot of Building Space) For Less A New Way".

J. A. ZURN MFG. CO., PLUMBING DIVISION
ERIE, PA., U.S.A.

PLEASE SEND ME THE NEW ZURN BOOKLET, "YOU CAN BUILD IT (CUBIC FOOT OF BUILDING SPACE) FOR LESS A NEW WAY."

Name and Title: ..........................................
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Please attach coupon to your business letterhead. Dept. AF

Rest Rooms with Fixture-Bare Floors in These Buildings and Hundreds of Others:

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Approved* Method of Cutting Costs in School Design

In-wall FOLDING TABLES AND BENCHES

COMBINE LUNCHROOM AND ACTIVITIES AREAS . . . ELIMINATE A SINGLE-PURPOSE ROOM!

* See Sweets Architectural File for details on this multiple-use-of-space equipment. Proven and accepted as practical by school officials and installed in hundreds of schools from coast to coast.

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used available space—

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On top of the four big bins is a 16' x 30' machinery house, the roof of which is 100' up in the air where space is always available—and free!

Maybe room upwards will solve your problem for handling and storing flowable bulk materials.

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$1295

Model D


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THE MAGAZINE OF BUILDING
The distinctive textured appearance and subtle tone variations of Armstrong's Cork Tile make it an excellent flooring choice for interiors with modern architectural styling. Its natural color, extra durability, and unusual resilience are the result of an exclusive manufacturing process that retains the natural characteristics of cork.

Parkside Branch
San Francisco Public Library
Appleton and Wolfard, Architects

ARMSTRONG'S CORK TILE
ARMSTRONG CORK COMPANY • LANCASTER, PENNSYLVANIA
Translucent Glass Jalousies* Divide An Office Without Disjoing Its Organization

Something is happening in modern office design! Venetian window partitions or jalousies employing translucent glass by Mississippi are fast replacing solid separations that cut off light, ventilation and communication from adjoining areas. These interior jalousies help integrate the entire organization and permit more accurate control of temperatures for heating and air conditioning.

The new adjustable dividers give each office better control of illumination and air movement. Opened or closed, the translucent glass floods interiors with softened "borrowed light" that creates a friendly feeling of spaciousness and comfort.

Opened windows permit the executive an unrestricted view of his entire force. Yet, he can have complete privacy when desired with an easy turn of the crank. And the closed vanes reduce office clutter to a minimum.

For "venetian window" office partitions, specify translucent, light diffusing glass by Mississippi. Available in a wide variety of patterns wherever quality glass is sold.

Send today for free booklet, "Figured Glass By Mississippi." Contains many ideas for commercial applications of this versatile, modern material.

*Mississippi Glass Co. does not construct or install jalousies. For estimates and other information, see your local supplier.

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WORLD'S LARGEST MANUFACTURER OF ROLLED, FIGURED AND WIRED GLASS

CONTEMPORARY CHANDELIERS: old world elegance for showrooms and lobbies

Executed by Sarfati of Milan, Italy for Lightolier, these white-tie ceiling fixtures are decor in the grand manner. Scaled for large rooms (the one below is of fullback proportions) they fancifully combine elegant forms with mechanics—flexible joints, movable discs, adjustable arms, etc. The crownlike chandelier at left has as its light source 16 polished brass cups which nest frosted incandescent bulbs. Most of the illumination is directed downward; the remainder plays around the radial filigree of 16 supporting rods. It retails for $325. Above, eggshell cups perch on a tubular brass spiral, aiming light in all directions— for $295.

Manufacturer: Lightolier, Inc., 11 E. 36 St., New York, N.Y.

EAMES HIP-POCKET CHAIR adapted for office use

The plastic shell which architect-designer Charles Eames countercontoured, somewhat generously, to fit most people has a new twist. A pivot plate beneath the flotsam mold gives (Continued on page 246)
SCHLAGE CYLINDRICAL LOCKS...Time-Proven

Schlage Dependability—proven by
25 years service—makes Schlage Locks
leading choice for today's important buildings

PEACHTREE-SEVENTH BUILDING
EQUIPPED WITH SCHLAGE "NOVO" DESIGN LOCKS

Peachtree—Seventh Building, Atlanta, Georgia
Architects, Alexander and Rothschild
Contractor, Charles R. Massell
Owner-Builders, Benjamin J. Massell

"The proved, low-cost maintenance record of Schlage Locks was an important factor in our final selection"—Alexander and Rothschild, architects.

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Barber-Colman Company can furnish Electric Door Operators to handle all kinds of overhead, sliding, swinging, and steel rolling doors, and sliding gates — and can also furnish all sizes of Barcol OVERdoors, the improved overhead doors. As a designer and manufacturer of both Doors and Operators, Barber-Colman is in a favorable position to provide properly matched equipment, to give experienced service, and to take good care of a wide range of requirements — all from a single source. You will be well advised to take advantage of the efficiency of this centralized responsibility. Consult your Barcol representative!

1. String of Barcol OVERdoors along the loading platform of a large warehouse.
2. A sliding factory gate, with Barcol Electric Operator controlled from the guardhouse.
4. Four big Barcol OVERdoors arranged for a vertical rise, with Electric Operators.
5. Heavy, automatic-closing metal-clad fire door with Barcol Electric Operator.
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by all ELECTRICAL standards

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by all LIGHTING Standards... When compared with the most approved standards in the science of illumination, "Magna-Flo" systems excel: in high lighting efficiency, because these units are specifically designed for maximum utilization of the highly efficient T12 Slimline Lamp; in high light output, providing high footcandle readings on vertical surfaces and horizontal levels; in proper brightness balance, to provide maximum visual comfort and seeing efficiency; in elimination of direct glare, to reduce eye fatigue and interference with vision.
Compare Benjamin "Magna-Flo" Industrial Lighting Systems with all established quality standards. You'll easily see why "Magna-Flo" units excel all ways! The "Magna-Flo" line is SO COMPLETE that over 300 combinations are possible from just 4 basic reflectors and 3 channels. This completeness makes possible TASK-MATCHED installations for the proper lighting of practically all types of industrial seeing tasks. In addition, "Magna-Flo" excels:

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by all CONSTRUCTIONAL Standards... In "Magna-Flo" units you get equipment that meets the maximum established electrical standards to assure simplified installation, high efficiency and dependable operation. Top-of-channel knockouts provide handy line-wire entrances. Channel caps are easily fastened to the channel by two screws. For maximum efficiency and continuously-cool operation only high-power factor "ETL"-approved ballasts are standard equipment on "Magna-Flo" lighting units.

the chair the free-swiveling mobility essential to office efficiency. A metal rod cat's cradle braces the wood legs. The shell is pigmented in four neutral tones—elephant hide, greige, parchment and neutral gray—and in lemon, sea foam green, red, and dark blue. The legs are birch or walnut. Retail price is about $39.50.

Manufacturer: Herman Miller Furniture Co., Zeeland, Mich.

Square cut ends on the glass holding members make neat corners and cut installation expense.

BUTT JOINT WINDOW MOLDING: clean corners on store fronts

The Butt-Way store front moldings used throughout the Framingham, Mass. "Shoppers' World" (Dec. issue '51) eliminate costly mitering and capping. Fabricated of extruded aluminum coated for corrosion resistance, the glass holding members have flat surfaces and square cut ends which are butted together. The channel is drawn snug against the glass by tightening a bolt (diagram above). Labor time in this installation method is reputed to be 25% less than in conventional techniques.


LIGHT FIXTURE reproduces true whiteness of sunlight

In showrooms, industries and beauty salons where artificial illumination must be used to reveal the true color of merchandise or people—for sales, fabricating, or psychological reasons—the Spectro-Lite may find wide usage. By means of a specially engineered curved reflecting surface, the fixture blends primary light colors to produce a color temperature of 6,000 kelvins—a balanced white light which shows white as white and tinges black with red, just as sunlight does on a clear day. The ceiling model pictured utilizes two blue 6' slim-line lamps (partially shielded by the curved covers), two red and two cool white lamps. It sells for $170.

Manufacturer: John P. Filbert Co., Inc., 2007 S. Vermont Ave., Los Angeles 7, Calif.

(technical publications, page 250)
FOR LEAKPROOF, TROUBLE-FREE PIPE RUNS

Cut-away view of a Walseal Tee showing ring of silver brazed alloy, and completed Silbraz joint.

Specify Walseal* Products

On all types of piping jobs where Type "B" copper or red brass pipe is used, trouble can be avoided by installing Silbraz* joints — made with Walseal valves, fittings and flanges.

Threadless, patented Silbraz joints are silver brazed (not soft soldered) pipe joints that are leakproof, trouble-free — permanent . . . connections that will not creep or pull apart; that literally join with the piping system to form a "one-piece pipe line". Thus, these modern joints eliminate the need for maintenance and costly repairs — especially important where lowered operating costs are imperative.

For complete details on the modern Silbraz joint, made with Walseal products, write for a copy of Walworth Circular 84.

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Here in this close-up is seen the sturdy interlaced reinforcing that Steelcrete gives to concrete walls.

In this photograph the simplicity of Steelcrete assembly is readily seen.

In the roof view, note the relatively long spans made possible by Steelcrete’s lateral stiffness.

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For over half a century, the name Ing-Rich has stood for the very best in Architectural Porcelain Enamel for indoor or outdoor applications. Ing-Rich Porcelpanels and specially formed parts can be depended upon for dimensional accuracy, correct color match and durability.

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The important answer—illustrated in full color, analysed in depth—will appear in the May issue of House & Home.

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HOUSE & HOME

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Diffused Lighting... with PLEXIGLAS

You may well think you are under a naturally-lighted skylight when you visit this gallery at the Museum of Fine Arts in Boston. The effect, however, is obtained by the use of translucent white diffusing panels of PLEXIGLAS acrylic plastic, mounted below fluorescent lamps.

PLEXIGLAS luminous ceilings provide high quality lighting in eight new exhibition rooms at the Museum. The totally diffused illumination is free of shadows and reflected glare. The effect of daylight, the most desirable condition for human vision, is achieved and the disadvantages of depending upon natural light, with its constantly shifting values, are eliminated.

The even spread of artificial light across the PLEXIGLAS surfaces and the absence of visible lighting fixtures make the luminous ceilings architecturally appealing. Higher light intensity and full color values for the paintings are supplied by directional louvers and recessed spotlights.

PLEXIGLAS luminous ceilings satisfy the requirements of architects and lighting engineers for low brightness ratios, high illumination levels, excellent diffusion, and fixture-free appearance. In addition, the lightweight yet strong diffusers are removed easily and safely for cleaning and for access to the lighting source, resulting in a sustained high level of lighting performance.

If you have a lighting problem, investigate "daylighting" with a PLEXIGLAS luminous ceiling. We will be glad to send you technical details about the installation shown above. Write for them.

The Rohm & Haas exhibit at the Fourth International Lighting Exposition and Conference, May 6-9, Public Auditorium, Cleveland, Ohio, will be in Booth 153.
CONSTRUCTION STORY

AS YOU LOOK at this building, you're immediately impressed with the way its entrance feature of green terra cotta Seaporcel porcelain enamel dramatically harmonizes with the rest of the structure.

A PERMANENT facing material of lasting beauty, Seaporcel blends strikingly with any background, whether brick, stone, aluminum or wood.

IN PLANNING new buildings—or making OLD buildings look NEW—architects all over America are specifying Seaporcel because they can always depend upon Seaporcel as a happy solution to the problem of economically utilizing their construction appropriation.

fabricated in any shape, form or section: rounds, compound curves, flutings, read­lings, etc. Obtainable in such versatile textures as "Terra Cotta," "Granite" in Semi-Matte or Gloss finishes; also our new "Leathorcel" finish.

Write today for copy of the Seaporcel idea brochure showing numerous sample installations.

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First Skyscraper in New York
with . . .

Construction Advantages

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2. Lightweight PERMALITE/plaster also used throughout on interior walls.

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80,000 square yards of lightweight Permalite/plaster were used in this building. Permalite aggregate was specified for good reasons:

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They’re reading House & Home... "Superb," Antonio Simon, Architect
"Invaluable," Gordon Balazey, Architect
"A great contribution to the industry," David D. Bohannon, Builder

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To get efficient fluorescent lighting
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There's more to satisfactory fluorescent lighting than lamps and a reflector. There's always a ballast in the fixture... and the way it performs determines whether you'll get full lamp life, rated light output and satisfactory performance.

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