HEADQUARTERS FOR A CONSERVATION COMMISSION BY HELLMUTH, OBATA & KASSABAUM
SAMOA: A NEW FRONTIER FOR ARCHITECTURE IN THE FAR PACIFIC
BUILDING TYPES STUDY: DESIGN FOR RECREATION
SEMI-ANNUAL INDEX
FULL CONTENTS ON PAGES 4 AND 5

ARCHITECTURAL RECORD
DECEMBER 1966 12  A McGRAW-HILL PUBLICATION  TWO DOLLARS PER COPY
this lobby says welcome—softly—with ceramic tile

Here’s a perfect transition from bustling street to quiet interior—a lobby that’s muted in color, low key in mood. American Olean ceramic tile in subtle colors sets that mood. On the floor, soft browns and blues in an original blend of ceramic mosaics. On the curved wall, soft brown Crystalline tile with discreet black and white accents. Sparkling white Crystalline scored tile highlights the supporting column.

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THE DURIROX COMPANY, INC. DAYTON, OHIO DURCO

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Gas plus Carrier absorption cooling simplifies the complex climate problems of this compact school. Economically.

The new Nathan Hale Junior High School in Omaha specified Gas-powered Carrier air conditioning to meet unique climate control problems of modern schools.

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For heating and cooling...Gas makes the big difference
For more data, circle 4 on inquiry card
Rickson and Stevens enhance modern day "cave" in a sophisticated country home with ceramic tile.

The focus of this home, located in a wooded area of Winnetka, Illinois, is the "cave" — a room within a room. It was designed to meet the owner's requirement of an intimate yet isolated conversation area. The cave as well as the surrounding entry, dining and living areas have ceramic tile floors.

The philosophy behind the design of this home is the use of a prismatic plan offering maximum opportunity to capitalize on spectacular views in all directions. At the same time, privacy is accommodated by the adaptation of individual, adjoining living "cells," each with its own roof.

Throughout the home, architects Erickson and Stevens have made extensive use of ceramic tile for decorative as well as functional values. Bathroom vanity tops, tub enclosures and walls are finished in random ceramic mosaic tile with quarry tile. In the kitchen, counter tops and back-splashes are tiled for color harmony and beauty.

If you're looking for a material with limitless possibilities in combined decorative and functional use, look for ceramic tile made in U.S.A. and Quality Certified by the Tile Council of America. The triangular seal at right is your assurance of glazed wall tile, ceramic mosaic tile and quarry tile that is approved to meet the most rigid government specifications. For more information about this Quality tile, a material that can be used with confidence indoors and outdoors, write: Tile Council of America, Inc., 800 Second Avenue, New York, N.Y. 10017.

For more data, circle 5 on inquiry card.
FEATURES

THE FAR PACIFIC: A NEW FRONTIER FOR ARCHITECTURE
A major development program for American Samoa gives architecture a significant role in the achievement of social and economic objectives.

SOUTHERN ILLINOIS’ NEW EDWARDSVILLE CAMPUS
A review of the completed first stage of construction of Hellmuth, Obata and Kassabaum’s master plan for a new university.

WAREHOUSES AND DISTRIBUTION CENTERS
A quiet revolution in the warehousing and distribution of goods has called forth a new array of planning and programming considerations relating architects more closely and responsibly to management problems.

IMAGINATIVE SPACES DRAMATIZE LOW-BUDGET HOUSE
Shed roofs with clerestory windows give exterior form and interior excitement to this house, designed by Clovis Heimsath for a sculptor and his family.

RECREATION: FRESH OPPORTUNITIES FOR INVENTIVE DESIGN
The push for greater and greater quantity of recreation facilities across the country seems, happily, to have generated considerable excitement about quality—fresh design approaches to old and familiar problems. Examples:

RIIS PLAZA: KEEN UNDERSTANDING OF HUMAN NEEDS
A pictorial look at why and how this urban open space works so well.

TWO NEW PROJECTS THAT EXPAND THE RIIS IDEAS
A new kind of play field and new kind of schoolyard by Pomerance & Breines, and Paul Friedberg.

DESIGN THAT EXEMPLIFIES THE IDEA OF CONSERVATION
Warm yet precise design for a recreation building by Hellmuth, Obata & Kassabaum Inc.

CENTRAL PARK’S FOUNTAIN CAFE: NEW LIFE FOR A LANDMARK
Architect James Lamantia’s solution to bringing people into the park.

A PRIVATE TENNIS CLUB: SIMPLE, DISCIPLINED, ECONOMICAL
A thoughtful two-stage scheme for a limited budget development by George Nemeny.

STUDENT CENTER FOR A SCHOOL: Cotswold Contemporary
This fresh design fits well within an unusual environment. Architects Sherwood, Mills & Smith.

ARCHITECTURAL RECORD, December 1966, Vol. 140, No. 6. Published monthly, except May, when semi-monthly, by McGraw-Hill, Inc., 330 West 42nd Street, New York, New York 10036. CORPORATE OFFICERS: Donald C. McGraw, Chairman of the Board; Shelton Fisher, President; John J. Cooke, Vice President and Secretary; John L. McGraw, Treasurer. SUBSCRIPTION RATE: for individuals in the field served $5.50 per year in U.S. possessions and Canada; single copies $2.00; further details on page 6. THIS ISSUE is published in national and separate editions. Additional pages of separate edition numbered or allowed for as follows: Western Section (including Western Architect and Engineer) 32-1, through 32-12. PUBLICATION OFFICE: 1500 Egleton Place, N.E., Washington, D.C. 20002. Second-class postage paid at Washington, D.C. POSTMASTER: Please send form 3579 to Fulfillment Manager, ARCHITECTURAL RECORD, P.O. Box 430, Hightstown, N.J. 08520.
146 FIELD HOUSE: BOLD SOLUTION TO SIZE AND SPACE PROBLEMS
A hillside solution minimizes the bulk of this athletic center. Architects: Callister, Payne & Rosse.

151 GLAZING RECOMMENDATIONS FOR TINTED GLASS
New report tells how tinted glazing should be designed and specified to enhance structural reliability. The objective is to minimize the effects of stresses induced by solar energy absorption.

155 TOTAL ENERGY FOR FIVE APARTMENT GROUPS
A combination of factors, including a centralized maintenance program, favored the use of on-site power generation and heat recovery in five housing complexes in Kansas City.

158 LIGHTING LABORATORY FOR CONSULTANTS
Engineers Syska & Hennessy establish their own laboratory to check appearance and performance of lighting designs.

163 BUILDING COMPONENTS
A synthetic rubber membrane waterproofs the roof of an underground garage at an apartment development by I. M. Pei & Partners.

165 PRODUCT REPORTS
166 OFFICE LITERATURE
255 READER SERVICE INQUIRY CARD

9 BEHIND THE RECORD
"Man Is Really An Animal and Thus Does He Respond" by Emerson Goble.

10 PERSPECTIVES
35 THE RECORD REPORTS
44 CURRENT TRENDS IN CONSTRUCTION
46 BUILDING CONSTRUCTION COSTS
64 REQUIRED READING
89 LETTERS
235 CALENDAR AND OFFICE NOTES
248 SEMI-ANNUAL INDEX
252 ADVERTISING INDEX
COMING IN THE RECORD

A NEW COST INFORMATION SERVICE FOR ARCHITECTS

Serving a great and growing need for currency in architects' general knowledge about costs in the very early phases of project development (rather than the pin-point expertise of the estimator's take-off) is the objective of a new service tapping the resources of consultants and information gathering facilities, interpreting what's happening that may affect either the client's program or the design development.

INDUSTRIAL ARCHITECTURE OF QUALITY

Next month's Building Types Study on Industrial Buildings offers a thoughtful look at the range and quality of the contribution architects are these days making to the architecture of industrial buildings, with a wide variety of examples testifying also, it would appear, to an increased interest on the part of industrial clients to amenity as well as efficiency.

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MAN IS REALLY AN ANIMAL
AND THUS DOES HE RESPOND

If you are as preoccupied with other matters as I am, probably you never heard of "the territorial imperative," or the science of ethology. Hang on a minute; "the territorial imperative" is just the urge of animals and humans to grab a bit of territory, and defend it to the death. "Ethology"—it's not in my dictionary—is the science of the behavior of animals.

But I have had a very interesting time with a book called "The Territorial Imperative," by Robert Ardrey. It sets out to establish many of man's basic urges and needs, and it shatters many shibboleths about how man arrived where he is, and why he responds as he does. Thus it is the greatest of stimulants, and involves security.

What—no sex? No civilization? No religion? No science? No evolutions? Well, they all come in and out; at least there is a great argument about them. But the thesis of the book is that man is an animal with those three absolute necessities. The author believes that if we understood these matters better, we might resist blowing ourselves into kingdom come.

And the architect? Well, it doesn't take much looking at the first of his human needs—identity—to see the importance of building design. Maybe man would fight for his little plot if it had only a miserable shack on it. But his territorial imperative is driving him ever to improve it, to build his identity to a higher status.

Probably, however, man's impulse to build identity gets into a thousand complications. Maybe he builds a great attachment for a little park, a monument building, an architectural achievement. Even though none of these involve any ownership by him, he may develop an attachment which becomes part of his being, his identity. The territorial imperative is why, no doubt, slum dwellers fight so hard to preserve their miserable old houses—their identity is destroyed with their homes.

Quality of design is naturally a vital part of man's feeling of identity with buildings—or furniture, or anything else that he can form an attachment for.

I shall not try to tell you how to style your buildings, to build them into his territorial identity. I'll be content with just one observation: don't forget that the next necessity for man is stimulation. Don't bore him to death.

—Emerson Goble
The engineering approach collides with esthetics

Esthetics won a considerable battle recently when Berkeley citizens voted to tax themselves more than $20 million to put its new transportation lines underground. That is, of course, for the three and a half mile run through the city itself. The voters believe in their city and its beauty and they'll keep it as they want it if it does cost some money.

One engineer, Leroy Greene, reminds engineers that perhaps they have a lesson to learn. "The city puts its money on the line—$20 million worth—to back its esthetic choice."

"Community values are often left far behind in our search for economic solutions for engineering problems. We engineers need to reconsider the weighing of the ingredients that add up to the best solution to a given engineering problem. . . . While price is a major concern, the Berkeley community has indicated to us that an esthetic value has a weight that cannot be measured in pounds. . . . We engineers sometimes lose sight of the public's willingness to pay for what it wants."

Save New York's old buildings: 58,000 of them are waiting

Talking of the possibilities of rehabilitation of old neighborhood buildings, HUD Secretary Robert C. Weaver said that there are 58,000 buildings in New York City qualifying for rehabilitation. They provide housing for 800,000 families, of course, 800,000 new kitchens and bathrooms, millions of windows and doors.

"What I have just been talking about are the figures only for New York City. To project the figures for the nation as a whole raises the prospect of dealing with numbers of walls, windows, and kitchens so astronomical that only a computer could comprehend them."

Well, that should satisfy the most ardent preservationist. It should satisfy too (see previous page) the built-in attachment of the slum dweller to his building and his neighborhood. And it might just be more popular than many a bulldozing urban renewal project. Secretary Weaver will have to watch out that he doesn't get caught in the middle.

The unhappy automobile, a national problem

It is almost a cliché now to say that we must not simply scorn the automobile, and ban it from our thinking. Paul Rudolph recently phrased it neatly: "The American genius for building throughways, bridges, intersections, rendered almost as voluptuous as a Rubens painting is deep in the American tradition of going on, on, on. There is an assuredness of form, when dealing with the moving automobile, that is often breathtaking. It is noteworthy that we seldom question the amount of money spent to get our cars from one place to another; however, the machine when at rest seldom seems happy, warring with its surroundings, indignant with being relegated to a slum of asphalt, ungainly lighting standards, multitudinous signs begetting other signs. The automobile, used to the splendors of the open road, is usually sad in its minimum car park and its occupant often has difficulty getting from the car to the building. In turn many buildings are almost entirely swallowed by the armadas of cars threatening them."

And: "Yes, the automobile and its relationship to the building will become the chief characteristic of the middle 20th century. Le Corbusier foresaw all of this in his proposals for Algiers and the revised road bed which becomes a building, or a series of buildings, several miles long."

"The proposed lower Manhattan expressway is usually discussed as being built above the ground (at about a half the cost), or below the ground. Land values are, of course, destroyed with a huge expressway above the ground. However it would be a different story if the raised expressway were conceived as a building or series of buildings, with the road bed at the top. Such a building should adapt itself to existing buildings on either side."

Rehabilitation being pushed from another direction

The idea of rehabilitating sub-standard buildings, instead of tearing them down, got a boost also from a manufacturer. James J. McLaughlin, of U.S. Gypsum, told the Producers Council that he sees a shift from land clearance to rehabilitation in the solving of city housing problems. He said that 30,000,000 Americans are said to be living in sub-standard dwellings, and that a government survey put the number of deteriorated apartments at 9.2 million.

U.S. Gypsum, he said, is convinced that private enterprise, working in concert with Federal agencies, can offer the best solution to the problem of deterioration. McLaughlin cited estimates that place this market at $52 billion in the next few years.

He points out that many old buildings are structurally sound, that it costs half to rehabilitate them as compared with replacing them, that time is a factor, and that neighborhoods can be preserved.

—E.C.
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RYERSON BBRV
POST TENSIONING
FOR PRESTRESSED CONCRETE STRUCTURES

SEE LAST PAGE FOR PROJECT DETAILS

For more data, circle 13 on inquiry card

6. Airline Terminal, Detroit Metropolitan Wayne County Airport—Each of five 70 x 232-foot post-tensioned concrete roof panels made massive-looking by parapet beams is supported on two tapering cruciform columns. Roof loads are carried to columns by a graceful web of curved and straight post-tensioned concrete roof beams. **Owner:** Wayne County Road Commission. **Architect and Planners:** Smith, Hinchman & Grylls Associates, Inc. **General Contractor:** A. J. Etkin Construction Co., Oak Park, Mich. **Post Tensioning Subcontractor:** Conesco Midcontinent, Inc.

7. United Air Lines Executive Offices—Two-story structure near Chicago’s O’Hare Field achieves dramatic 66’ x 60’ clear spans with continuous 2-way post-tensioning of waffle slabs 2’-6” thick. **Architect:** Skidmore, Owings & Merrill, Chicago. **Contractor:** Gust K. Newburg Construction Co.

8. Oneida Lake Bridge—Nation’s longest post-tensioned concrete span is the 320’ center span of this bridge near Brewerton, N.Y. Shown here are six of twenty-four 146’ cantilever girders weighing 240 tons each. **Owner:** State of New York Dept. of Public Works. **Engineers:** Summers, Munniger & Molke. **General Contractor:** Terry Contracting, Inc.

9. Pulp Tanks for paper plant in Jackson, Alabama, have concrete cores faced with tile on both sides. Each has capacity of 138,320 cubic feet of high density pulp. Post-tensioned tendons resist all circumferential forces including ring tension at top of cone base. **Owner:** Allied Paper Corp. **Tank Designer:** James N. DeSerio, P.E. **Erector:** Stubbins Engineering & Mfg. Co.
THE SYSTEM — Ryerson BBRV post tensioning provides the most efficient, economical and aesthetically satisfactory answer to a wide range of structural framing requirements. Frequently enlisted advantages of the system include:

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- assistance in feasibility studies on the use of post tensioning in specific projects
- preliminary cost data
- specifications and details
- information and experience gained in working on all types of post tensioned structures that may be helpful in your design and layout decisions. This experience includes the largest building and heavy construction projects, both within the U.S. and overseas.

FOR CONTRACTORS Ryerson provides:

- shop-fabricated tendons completely assembled and ready for placement with all fittings attached
- detailed placing plans, force computations and stressing data
- equipment needed for stressing and grouting
- reliable labor estimates plus job-site training in equipment use — or, if preferred...
- in-place quotations with Ryerson providing the materials and labor needed to deliver a complete package — installed tendons, stressed and grouted.

TENDON FORCE CALCULATOR

When the location and magnitude of the prestressing force requirement for a structural member has been developed, Ryerson can, at your option, select the appropriate type of anchorage and tendon size. And we will provide placing drawings.

Wire is 0.25 inches nominal diameter (Area = 0.04909 square inches) complying with ASTM-A421-58T specification. Minimum ultimate strength of wire is 240,000 P.S.I.

<table>
<thead>
<tr>
<th>NUMBER OF WIRES</th>
<th>CROSS SECTIONAL AREA Square inches</th>
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<th>TEMPORARY OVERSTRESSING FORCE Max. in Kips</th>
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<td>636.2</td>
<td>848.3</td>
</tr>
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For more data, circle 13 on inquiry card
In order to serve you better we have standardized on the wire capacities and hardware sizes listed for each type of anchorage. But note that any anchorage can be used with any number of wires (up to its maximum capacity) required to produce a specified prestressing force. Also note that special anchorages can be developed to meet unusual job requirements.

Types B through N and type G are shown with grooved tendons. Types P through Km are shown with greased and wrapped tendons. These are the usual applications, but all types of anchorages can be produced for either type of tendon.

**TYPE B**

<table>
<thead>
<tr>
<th>Anchor Designation</th>
<th>Number of Wires</th>
<th>Bearing Plate Size in Inches</th>
<th>Trumpet O.D., Inches</th>
<th>Conduit O.D., Inches</th>
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<td>4</td>
<td>1⅝</td>
</tr>
<tr>
<td>28B</td>
<td>28</td>
<td>9⅛ x 9½</td>
<td>5</td>
<td>2⅝</td>
</tr>
<tr>
<td>40B</td>
<td>40</td>
<td>11 x 11</td>
<td></td>
<td>2⅝</td>
</tr>
</tbody>
</table>

**TYPE E**

<table>
<thead>
<tr>
<th>Anchor Designation</th>
<th>Number of Wires (Max.)</th>
<th>Bearing Plate Size in Inches</th>
<th>Trumpet O.D., Inches</th>
<th>Conduit O.D., Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>14E</td>
<td>14</td>
<td>6⅝ x 6¼</td>
<td>3</td>
<td>1⅝</td>
</tr>
<tr>
<td>28E</td>
<td>28</td>
<td>9⅛ x 9½</td>
<td>4</td>
<td>2½</td>
</tr>
<tr>
<td>40E</td>
<td>40</td>
<td>11 x 11</td>
<td></td>
<td>2½</td>
</tr>
<tr>
<td>46E</td>
<td>46</td>
<td></td>
<td></td>
<td>2½</td>
</tr>
</tbody>
</table>

**TYPE L**

<table>
<thead>
<tr>
<th>Anchor Designation</th>
<th>Number of Wires (Max.)</th>
<th>Bearing Plate Size in Inches</th>
<th>Trumpet O.D., Inches</th>
<th>Conduit O.D., Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>28L</td>
<td>28</td>
<td>9⅛ x 9½</td>
<td>5½</td>
<td>6½</td>
</tr>
<tr>
<td>40L</td>
<td>40</td>
<td>11 x 11</td>
<td></td>
<td>2½</td>
</tr>
<tr>
<td>46L</td>
<td>46</td>
<td></td>
<td></td>
<td>2½</td>
</tr>
</tbody>
</table>

**TYPES KB & KL**

For coupling to B and L type anchor

Available as 14Kb, 28Kb, 40Kb, 28Kl, 40Kl, 46L
**TYPE S**

<table>
<thead>
<tr>
<th>ANCHOR DESIGNATION</th>
<th>8S</th>
<th>14S</th>
<th>20S</th>
<th>28S</th>
<th>40S</th>
<th>46S</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMBER OF WIRES (Max.)</td>
<td>8</td>
<td>14</td>
<td>20</td>
<td>28</td>
<td>40</td>
<td>46</td>
</tr>
<tr>
<td>BEARING PLATE SIZE IN INCHES</td>
<td>8 x 3</td>
<td>7 ¾ x 7 ¾</td>
<td>10 x 6</td>
<td>11 x 7</td>
<td>12 ½ x 8</td>
<td>13 ½ x 9 ½</td>
</tr>
</tbody>
</table>

**TYPE N**

<table>
<thead>
<tr>
<th>ANCHOR DESIGNATION</th>
<th>24N</th>
<th>30N</th>
<th>38N</th>
<th>46N</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMBER OF WIRES (Max.)</td>
<td>24</td>
<td>30</td>
<td>38</td>
<td>46</td>
</tr>
<tr>
<td>BEARING PLATE SIZE IN INCHES</td>
<td>7 ¼ x 7 ¼</td>
<td>8 ⅞ x 8 ⅞</td>
<td>9 ⅝ x 9 ⅝</td>
<td>10 ⅞ x 10 ⅞</td>
</tr>
<tr>
<td>ROD O.D., INCHES</td>
<td>2</td>
<td>2 ¼</td>
<td>2 ½</td>
<td>2 ¾</td>
</tr>
<tr>
<td>TRUMPET O.D., INCHES</td>
<td>2</td>
<td>3</td>
<td>3 ¼</td>
<td>3 ½</td>
</tr>
<tr>
<td>CONDUIT O.D., INCHES</td>
<td>2 ⅛</td>
<td>2 ¼</td>
<td>2 ½</td>
<td>2 ¾</td>
</tr>
<tr>
<td>SLEEVE O.D., INCHES</td>
<td>4 ½</td>
<td>5</td>
<td>5 ¼</td>
<td>5 ½</td>
</tr>
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</table>

**TYPE G**

**ROCK ANCHOR SYSTEM**

<table>
<thead>
<tr>
<th>ANCHOR DESIGNATION</th>
<th>18G</th>
<th>36G</th>
<th>54G</th>
<th>72G</th>
<th>90G</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMBER OF WIRES (max.)</td>
<td>18</td>
<td>36</td>
<td>54</td>
<td>72</td>
<td>90</td>
</tr>
<tr>
<td>BEARING PLATE Diameter, Feet &amp; Inches</td>
<td>8 ⅞”</td>
<td>1’ 0”</td>
<td>1’ 2 ½”</td>
<td>1’ 4 ¼”</td>
<td>1’ 6 ½”</td>
</tr>
<tr>
<td>TRUMPET O.D. INCHES</td>
<td>3 ¼</td>
<td>4 ½</td>
<td>5 ½</td>
<td>6</td>
<td>6 ½</td>
</tr>
<tr>
<td>STRESSING ANCHORHEAD Diameter in Inches</td>
<td>4</td>
<td>5 ⅛</td>
<td>6 ⅜</td>
<td>7 ⅛</td>
<td>7 ½</td>
</tr>
<tr>
<td>BORE HOLE Diameter in Inches</td>
<td>3 ½</td>
<td>4 ¼</td>
<td>5</td>
<td>5 ½</td>
<td>6</td>
</tr>
<tr>
<td>FIXED ROCK ANCHORHEAD Diameter in Inches</td>
<td>3 ¼</td>
<td>4</td>
<td>4 ¾</td>
<td>5 ¼</td>
<td>5 ½</td>
</tr>
</tbody>
</table>

For more data, circle 13 on inquiry card.
### Type P

<table>
<thead>
<tr>
<th>Anchor Designation</th>
<th>8P</th>
<th>14P</th>
<th>20P</th>
<th>27P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Wires (Max.)</td>
<td>8</td>
<td>14</td>
<td>20</td>
<td>27</td>
</tr>
<tr>
<td>Bearing Plate Size in Inches</td>
<td>3½ x 8¼</td>
<td>5½ x 9</td>
<td>6 x 10</td>
<td>7 x 11</td>
</tr>
</tbody>
</table>

### Type H

<table>
<thead>
<tr>
<th>Anchor Designation</th>
<th>8H</th>
<th>14H</th>
<th>20H</th>
<th>28H</th>
<th>35H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Wires (Max.)</td>
<td>8</td>
<td>14</td>
<td>20</td>
<td>27-28</td>
<td>35</td>
</tr>
<tr>
<td>Bearing Plate Size in Inches</td>
<td>3½ x 8¼</td>
<td>3½ x 9</td>
<td>6 x 10</td>
<td>7 x 11</td>
<td>10 x 12</td>
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### Type M

<table>
<thead>
<tr>
<th>Anchor Designation</th>
<th>8M</th>
<th>14M</th>
<th>28M</th>
<th>35M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Wires (Max.)</td>
<td>8</td>
<td>14</td>
<td>28</td>
<td>35</td>
</tr>
<tr>
<td>Bearing Plate Size in Inches</td>
<td>3½ x 8¼</td>
<td>5½ x 9</td>
<td>7 x 11</td>
<td>10 x 12</td>
</tr>
</tbody>
</table>

### Type T

<table>
<thead>
<tr>
<th>Anchor Designation</th>
<th>8T</th>
<th>14T</th>
<th>20T</th>
<th>28T</th>
<th>40T</th>
<th>46T</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Wires (Max.)</td>
<td>8</td>
<td>14</td>
<td>20</td>
<td>28</td>
<td>40</td>
<td>46</td>
</tr>
<tr>
<td>Bearing Plate Size in Inches</td>
<td>6½ x 3½</td>
<td>8 x 5</td>
<td>11 x 5</td>
<td>9½ x 8</td>
<td>16 x 7</td>
<td>13 x 9½</td>
</tr>
</tbody>
</table>

### Type K

- **Type K**
  - For coupling to M type anchor
  - Available as 8Km, 14Km, 28Km, 35Km
FIELD EQUIPMENT DATA

GENERAL ARRANGEMENT FOR STRESSING BONDED TENDON

GENERAL ARRANGEMENT FOR STRESSING UNBONDED TENDON

STRESSING JACK DATA

<table>
<thead>
<tr>
<th>STRESSING CAPACITY (Max. No. Wires)</th>
<th>8</th>
<th>12</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>54</th>
<th>108</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAPACITY (Tons)</td>
<td>40</td>
<td>60</td>
<td>100</td>
<td>150</td>
<td>200</td>
<td>250</td>
<td>500</td>
</tr>
<tr>
<td>MINIMUM CLEARANCE (G)</td>
<td>5&quot;</td>
<td>8&quot;</td>
<td>9&quot;</td>
<td>11&quot;</td>
<td>13&quot;</td>
<td>13&quot;</td>
<td>18&quot;</td>
</tr>
<tr>
<td>MINIMUM CLEARANCE (H)</td>
<td>3'-9&quot;</td>
<td>4'-0&quot;</td>
<td>4'-6&quot;</td>
<td>5'-0&quot;</td>
<td>5'-0&quot;</td>
<td>5'-6&quot;</td>
<td></td>
</tr>
<tr>
<td>JACK WEIGHT IN LBS. (With Accessories)</td>
<td>230</td>
<td>280</td>
<td>330</td>
<td>550</td>
<td>950</td>
<td>950</td>
<td>2550</td>
</tr>
</tbody>
</table>


Below: Stressing equipment including hydraulic jack and pump permit accurate measurement of force and elongation. Here, 200-ton jack is being used to stress 40-wire bridge beam tendons.

Above: Tendons for one-way slab to be poured in place over precast beams. (Tendons in one direction for temperature only.) Wide spacing with no auxiliary reinforcing steel needed makes placement of utilities and pouring easier.

Above: Grout-type tendons positioned in simply supported beam—in this case precast at the job site. Because of large forces developed by the Ryerson BBRV tendons, only three were required in this 95 ft. beam unit.
FRONT COVER PHOTOS


4. LaGuardia Airport Runway Extensions — One of the largest prestressed post-tensioned projects in the world encompassing two million sq. ft. of pile supported slab extending jet runways out into Flushing Bay. Owner-Engineer: The Port of New York Authority. Contractor: Steers, Spearin, Tully & Gerwick.

ON THIS PAGE


11. Rotatable shipping racks give protection to coiled tendons enroute, minimize storage space requirements at job site and simplify handling and placement.

12. Penstock Slope Stabilization at Mayfield Dam. 90-wire rock-anchor tendons 150' long were used by the City of Tacoma, Wash., to prevent movement of unstable slope under weight of intake structure. Engineers: Harza Engineering Co.
Now...the big ones are going All-Electric

More and more architects and engineers are finding that all-electric design, with flameless electric heating and cooling, can hold down first costs for clients in buildings of all types through the elimination of such items as boiler rooms, fuel storage, stacks and long pipe or duct runs.

Annual costs can also be reduced, since simpler control systems and lower maintenance require fewer employees.

Moreover, because of the wide variety of equipment types to choose from, all-electric design permits greater architectural freedom and flexibility. Expansion becomes easier, too. And all-electric design can also provide from 5% to 10% more usable floor space for additional building capacity.

For more facts about the proven advantages of applying all-electric design to your industrial and commercial buildings, call your local electric utility company. They will welcome the opportunity to work with you.

This plaque identifies a modern building, meeting the standards of electric heating, cooling, lighting and other applications set by Edison Electric Institute.

LIVE BETTER ELECTRICALLY
Edison Electric Institute, 750 Third Ave., New York, N.Y. 10017

For more data, circle 14 on inquiry card
Money-saving idea

Now you can get structural durable shop primers based on Tough, mill-applied coatings cost less than field application—give dependable protection during shipment, field storage and erection—provide an excellent base for a wide variety of topcoats.

Until recently, mill-applied primers on steel products were costly and did a poor job of protection. So most users of structural steel had to do the priming themselves in the field. But no longer. Now many structural steel suppliers are equipped to apply the first truly durable and economical shop primers for steel. These highly impact-, weather-, and corrosion-resistant epoxy coatings are based on Shell Epon and Eponol resins. They save you money in two ways:

1. Fabricators can offer these coatings at a very attractive price compared to materials and labor for field priming. Fast dry of the coating system, plus new automatic sandblasting equipment, permit the economies of production-line operation.

2. These primers have excellent resistance to the heat of cutting and welding operations, as well as to physical abuse and corrosive environments. This minimizes the amount of spot-repairing required before application of topcoats, and insures long-lasting protection of the coated structure.

Excellent base for topcoats

In addition, primers based on Epon and Eponol resins provide an excellent base for a wide variety of topcoat systems. In most cases, removal of surface contaminants by washing and/or solvent cleaning will insure good adhesion to the aged primer.

Bonus advantages

Cleaning and priming of the steel by the fabricator lets him do a better job of inspection. He's much more apt to spot flaws before shipment, saving you time and trouble on the jobsite. Also, shop-primed steel is cleaner and safer to handle.

Three cost-saving shop primers

Choose from a shop primer based on Epon resin or from two different primers based on Eponol resin. Here are the advantages of the three primers:

1. Zinc-rich primers based on Epon resin offer:
   - Outstanding adhesion, toughness and abrasion resistance—minimize damage in handling and fabrication.
   - Excellent resistance to corrosion at low film thickness—in most marine and industrial environments as little as ½ mil gives adequate protection until the finishing coats are applied (not recommended if exposure to highly acidic or alkaline atmospheres is expected to occur prior to application of topcoats).
steal precoated with truly Shell Epon® and Eponol® resins

- **Weldability**—there's no loss of corrosion resistance due to heat from welding and cutting—no hazard to workers. Except for certain critical applications involving special grades of steel, welds of entirely satisfactory quality can be made with zinc-rich primers.

2. **Zinc-rich primers based on Eponol resin**

These primers offer the same desirable properties as Epon resin-based zinc-rich primers with the exception of solvent resistance.

3. **General purpose primers based on Eponol resin** offer:

- **Outstanding adhesion and toughness**—minimize damage in handling and fabrication.
- **Excellent corrosion resistance**—a single 1-mil coat exhibits good resistance to atmospheric corrosion even in acidic, alkaline and marine environments.
- **Good intercoat adhesion with a wide variety of topcoats.**

Mail coupon for details and assistance

Many steel fabricators across the country can now apply these new shop primers to your specifications. At your request, Shell will arrange to have a formulator of these primers contact you. He will work with you and your steel supplier to bring you products with the exact shop primer your project needs. Just send in the coupon.

Steel members in this structure were coated with an Epon resin-based zinc-rich primer to prevent rusting during construction.

---

Shell Chemical Company
Plastics & Resins Division
110 West 51st Street
New York, New York 10020

I would like to be contacted by a formulator of: [ ] zinc-rich primers based on Epon resin  [ ] zinc-rich primers based on Eponol resin  [ ] general-purpose primers based on Eponol resin.

I am interested in using shop-primed steel for __________________________

Name __________________________

Position __________________________

Firm __________________________

Address __________________________

City __________________________

State __________________________

Zip __________________________

For more data, circle 15 on inquiry card

ARCHITECTURAL RECORD December 1966
Now...an answer to one of your difficult closure problems...

The New COOKSON FD10 Series U. L. Labeled Counter Fire Doors

Service-counter closures offering maximum fire protection used to look massive, heavy and cold. Now they need not.

We have a solution to the problem, no matter how critical your taste. It's the new Cookson FD10 Series U.L. Labeled Counter Fire Doors, styled in slim lines to complement modern decor.

Available in either push-up or crank operated design, FD10 Series Doors are being specified and used extensively in schools, cafeterias, offices, stores, ticket windows, hospitals...wherever fire safety and security must be provided without sacrifice of appearance.

See our catalog in Sweet's; or write for your own copy.

Key To Slim-Line Styling
Of The FD10 Series

The curtains of the Cookson FD10 Series Doors are fabricated from the miniaturized #10 slat, in either galvanized or stainless steel. With a center-to-center dimension of only 1¾", this slat has permitted substantial reduction of head and side room requirements.

For more data, circle 16 on inquiry card

THE COOKSON COMPANY
700 PENNSYLVANIA AVE., SAN FRANCISCO, CALIF. 94107
New... for the budget-minded with elegant ideas...

meet the moderately priced Radcliffe

using smooth-line sculptured gn. Modern low silhouette. No channels on the outside of bowl. effuent efficient siphon jet action. all give the new Radcliffe a look elegance. et, this siphon jet beauty sells at rd-fashioned, reverse trap price. ou get a choice of elongated rim gular rim, in telescopic and deco­ seat options. Available in white Crane decorator colors. As an on, you can choose the Neu­ tank... urethane-lined for minum sweat.

e thing more, there won't be

any time-consuming, unprofitable return calls because the Radcliffe is built to endure. We'll stake our engi­ neering reputation on that.

Call your Crane sales office, or wholesale distributor. Or write Crane Co., Dept. 008, 4100 South Kedzie Avenue, Chicago, Illinois 60632.

For more data, circle 17 on inquiry card

CRANE

VALVES • PUMPS • FITTINGS • WATER TREATMENT PIPING • PLUMBING • HEATING • AIR CONDITIONING
Studio Efficiency Apartments
Model 872 (photo above). This complete kitchen is easily designed into any apartment decor and space requirement.

Crane Chef Executive 1
This complete compact kitchen enhances beauty and efficiency of any office. Luxurious real wood cabinet in popular finishes. Hinged top for console convenience.

Crane Chef Model 872
A complete compact kitchen. Includes gas or electric range with oven and broiler; sink; 8 cu. ft. self-defrosting refrigerator with 40 lb. freezer; storage compartment. Disposer optional.

Executive Offices

Married Students' Housing
Model 554. Complete compact kitchen for tight space requirements of college dorms. Needs only 9 sq. ft. of floor space.
Crane Chef® announces the most complete line of compact kitchens—ever!

40 all-new models to solve your space problems.

With a choice of 40 models, the all-new Crane Chef line gives you a flexibility of design and choice never before available in compact kitchens.

Look at design. New, clean, straight edge profiles are keyed to complement contemporary taste for attractive simplicity in decor. Choice of colors, white, wood grains, copper tones—or even luxurious real wood.

Look at space. Largest, complete kitchen needs only 15 sq. ft. of floor space. And Crane Chef gives it to you eight different ways—complete to refrigerator, freezer, range, oven/broiler, storage, sink and drainboard. Disposer available in most models—plus all kinds of other options.

Look at flexibility. If you're thinking smaller, choose from compact refrigerators or ranges—singly or in combination—with or without worktops or sinks. Ranges and ovens: either gas or electric.

Here's even more flexibility. If the various Crane Chef ideas shown here don't match yours—we'll help you with custom-designing.

The new Crane Chef line is the biggest innovation to hit compact kitchening in many and many a year. Get all the details now. Contact Crane Showrooms in New York, Chicago, or Los Angeles; distributors in most cities; or write Crane Co., 4100 South Kedzie Avenue, Chicago, Illinois 60632.

THE NAME IS

CRANE

VALVES • PUMPS • FITTINGS • WATER TREATMENT
Piping • Plumbing • Heating • Air Conditioning

Second Homes
Model 529-GS has gas or electric counter-top range, sink and built-in refrigerator with full-width freezer.

Game Rooms
Model 529 is an under-counter or free-standing refrigerator with full width freezer compartment.

Motels & Hotels
Model 548. This complete kitchen provides full utility where space is at a premium. Takes only 8 sq. ft. of floor space—total.

Crane Co.
Crane Chef—Dept. 008
4100 South Kedzie Avenue
Chicago, Illinois 60632

Rush me a copy of your brochure on the all-new line of Crane Chef compact kitchens.

Name

Company

Address

City State Zip

For more data, circle 43 on inquiry card.
Crane constant pressure systems obsolete the water tower.

They cost less, take less space and do a better job.

Crane constant pressure systems offer a number of benefits old fashioned water towers just can't match. First, these systems are compact. Incorporating Crane pumps in an electrically controlled system, they require less space than mechanical systems . . . eliminate the need to build expensive foundation-to-roof supports.

Second, constant pressure means just that. No matter how many showers, baths, or other demands for water are turned on at the same time, the control system automatically senses the pressure requirements and signals the pumps to meet them. This procedure also saves on fuel and increases the pumps' operating life.

There are benefits over mechanical constant pressure systems, too: the solid-state control system responds quickly and accurately, with no moving parts to wear out; it also eliminates the need for a bulky fluid-coupling device. Another important feature: you don't need anybody around to operate the Crane system.

Learn all the economical facts about Crane constant pressure systems. Write for bulletin CP-1000, Crane Co., Dept. 008, 4100 South Kedzie Avenue, Chicago, Illinois 60632.

For more data, circle 127 on inquiry card
Western Articles to go National; No More "Western Section"

Next month this so-called Western Section of ARCHITECTURAL RECORD will move into the main section of the magazine. That is to say, our coverage of western buildings and western architectural achievements will be reported in the main section of the magazine, and we shall drop this localized coverage in the "Western Section."

We are anticipating that by this move we can increase the attention of the architectural field to the happenings in the western states. So much has been happening there, so much that is significant to the rest of the country, that we feel it all needs national exposure. We shall stop the practice of "this for Western, this for National." That is not to say that every little news item that once made the Western Section will automatically make the national edition, but it does mean that every significant architectural event will be nationally, not just locally, exposed.

We have been increasingly interested in the West. The West has always been more progressive in some ways than the East. But lately the western willingness to fly far has been forced to assume responsible leadership in many areas. Industrial expansion, population growth, new towns, new campuses, new highways and transit systems, and so on.

Now I am getting fearful lest in this view of the West you imagine any reflection on the efforts of Elisabeth Kendall Thompson, for 19 years our western editor. Certainly none is intended; rather it is the other way round. We want Betty to spend her time on the national edition, and make a larger contribution to it. While she has made large contributions to the national editions, she has always had to take time to arrange all that western copy and write that western editorial, and so on. Betty is already, of course, busy arranging more stories on western projects, breaking away from what was essentially a news orientation to architectural material.

No, you will not lose Betty. She will be doing business at the same old stand, and she will be—as she has been—the only staff member of an architectural magazine stationed on the West Coast. She will be more free to travel and will be more available for the larger, penetrating stories. She will have more visits from New York staff members on special story assignments. And if it is really true that the West is finding earlier solutions to some of the problems of Eastern cities, Betty will be interpreting these matters for the national audience.

You will lose her editorial page; indeed you have already lost it, because I am usurping her usual space for this announcement.

Perhaps at this point you can stand a bit of the lore of publishing. Betty's Western Section was always well read. (You know we have readership checked every so often, so that we don't have to guess about how our readers are following our efforts.) And yet readers never did show much enthusiasm for the idea of a Western Section. We made them feel a trifle provincial, I suppose. And they always wanted their own material published in the "National," not the "Western."

In any case, analysis shows that the original purpose of the Western Section has pretty well run out. Nineteen years ago the West was a lot farther away from the East than it is now. In fact, to tell the truth, it seems we started the special Western Section just as the two halves of the country began moving closer together. In the beginning many eastern building material manufacturers did not ship to the West Coast, and vice versa, and design was naturally restricted. For a while, too, the West necessarily paid more attention to local design influences—climate, outdoor living, and so on. But about the time the International Style was sweeping everything before it, all the other influences began to pull together, and we in the East learned about outdoor living and low-pitched roofs. Western readers began assuring us that they also lived in the United States.

Suffice it to say that magazines, like architects, are broadening their interests and activities, and the mere reporting of buildings of good architecture is but one of the functions of publishing. We shall never stop searching out and publishing good architecture, but we shall not limit ourselves to such recording. And so it is with the West—we need its architecture, yes, but we also need its leadership, its power, its penetration.—Emerson Goble
WESTERN BUILDINGS IN THE NEWS

Designed to take a second story, the new Republic National Bank building in Englewood, Colorado will be a pleasant pavilion in its initial phase. Precast concrete exposed aggregate panels face the steel columns and roof fascia; the building ends will be marble-faced. Side walls will be solar bronze tinted glass. Entrances will be at either end. Architect: Charles S. Sink; structural engineer: Robert H. Voiland; mechanical engineer: Francis E. Stark; electrical engineers: Swanson-Rink & Associates.

First of three new neighborhood bank buildings to be built by First Western Bank in its expansion program in California is this building in the West Shaw Shopping Center in Fresno. The design is the prototype for many such small branches to be built throughout the state. The building is actually square but appears circular because of the sunshades and trellis which shield the glass walls. Architects: Bodrell Jordan Smith & Associates; structural engineer: Yuda Wolfson; mechanical engineers: A-G Engineers.

An addition to Our Lady's Home for the Aged in Oakland, California will be the first phase of a four-phase expansion program aimed at ultimately providing accommodations and facilities for care of 450 ambulatory, semiambulatory and bed-ridden old people. The six-story addition will contain living quarters for 130 ambulatory persons, including single and (a few) double rooms, central kitchen, dining room, lounges and offices. Architects: Gerald M. McCue & Associates; general contractors: Pacific Company of Berkeley.

An automated distribution center for Koret of California, women's sportswear manufacturer, is under construction on a 10-acre site in Cabot, Cabot & Forbes Industrial Park in South San Francisco. The $3-million center will have a capacity for shipping of one-million units per month, and for storage of one-half-million units per month. Architects: Knorr & Elliott; contractors: MacDonald and Nelson.
A gold-anodized geodesic dome will form the auditorium and exhibition hall for the Pioneer Theater-Auditorium in Reno, Nevada. The 144-ft diameter dome, weighing 40,000 pounds and capable of withstanding 125-mile per hour winds and of carrying a 240-ton load of snow, will be erected in three weeks. In addition to the 1401-seat theater-auditorium and the 12,000-square-foot exhibition hall, the building will contain meeting rooms and a cocktail lounge. Architects: Bozalis, Dickinson and Roloff, Oklahoma City, in association with Ferris and Erskine, Reno; contractors: (dome) Temcor, (general) Brunzel Co.

Los Angeles' tallest apartment building is the recently completed Sierra Tower, 32 stories high. The $10-million, 144-apartment building stands on a one-acre site near Sunset Strip and Beverly Hills. The first five levels above ground provide parking for 246 cars; the sixth floor is a health club. Architect: Jack Allen Charney; structural engineers: Erkel, Greenfield & Associates; general contractors: Minskoff Construction Co.

To retain as many mature trees and shrubs as possible, aerial photographs, contour surveys and on-site inspections by the architects were a part of the pre-design analysis for the new Finn Hill Junior High School in King County, Washington. Site is a 30-acre wooded area on the brow of a hill near Kirkland. The school provides for 830 pupils and includes facilities for 24 handicapped students. Total costs came to $19.21 per square foot. Architect: Waldron Dietz; structural engineer: John H. Stevenson; mechanical engineer: Notkin & Associates; electrical engineers: Beverly A. Travis & Assoc.; contractor: Vandivort Construction.

Low-rent housing for Alaska cities and villages is well under way, with the first of the post-earthquake projects due for completion early next year. Among projects under construction is Loussac Manor in Anchorage, an eight-acre subdivision of one and two story residential structures and a community center. Architects: Crittenden, Casseta, Wirum and Jacobs; contractors: Investment Contractors Inc.
Honor award, Western Mountain Region, A.I.A. Resources Inc., Denver, Colorado. Architects: Moore and Bush.

A.I.A. and A.I.D. present awards at joint conference

This year's annual awards program at the Western Mountain region, A.I.A., conference was extended to incorporate a program for members of the American Institute of Interior Designers who met with the A.I.A. in Santa Fe. Each program was separately judged and honors were separately awarded. In addition to an honor award in each program, five architectural merit awards were presented.

First Unitarian Church, Albuquerque, New Mexico. Architect: Harvey S. Hoshour.


Spokane architects honor four buildings

Four buildings by three architectural firms received awards in the 1966 honors program of the Spokane chapter, A.I.A. Two residences, a prison chapel and an airport terminal were selected for honors by a jury of three architects: Robert Wilmens, Portland; David McKinley, Seattle; and Donlyn Lyndon, Eugene, Oregon. A Design Concept Seminar, in which the jury participated, was held as part of the awards program.

Honor award

Merit award

Merit award

Western topics

Changes in the earthquake safety code, proposed by the Structural Engineers Association of California, have been adopted by the City of Los Angeles and by the International Conference of Building Officials. The new regulations lift the 160-foot-height limit—under certain rigorous design and construction conditions—to permit the use of a reinforced concrete frame in tall buildings. The change is based on attaining ductility on quake-resistant buildings and on the practical design and construction techniques for obtaining such ductility.

Washington State's 1961 billboard law, upheld as constitutional last August, is in for a real test. A group of billboard companies will appeal the ruling on the basis that the federal government, through the 1965 Highway Beautification Act, has preempted the field of billboard control, and that exercise of the state's police power should not preclude the possible compensation of billboard owners whose signs have to be removed.

Minimum effect on the village of Las Trampas, New Mexico, has been promised by Governor Jack Campbell as a result of a meeting with the governor at which four architects, Nathaniel A. Ovings of San Francisco and Pojoaque, New Mexico, Santa Feans John Gaw Meem, John McHugh and John Conron were present. The new road, whose width and route had threatened the integrity of the historic village and its fine church (Western Reports, November 1966), now will wind through the village on the existing route and will not be widened. The architects led the fight for preservation.

An ordinance "to preserve historical, architectural or esthetic landmarks" is under consideration by the San Francisco Planning Commission. The proposed ordinance sets up an Advisory Board to recommend sites (such as Mission Dolores) and districts (such as Chinatown) worth preserving, and permits property owners to ask for classification of their property, if it is qualified, as a historical, architectural or esthetic landmark. Under the latter provision the owner would be under pressure to maintain his property and would require future buyers likewise to maintain it.

Hawaii's new state capitol building may be finished a year early—by November 1968—according to the contractor's present estimates. With continued good weather and on-time delivery of materials, it is expected that the first-floor chambers, for the Legislature and the Judiciary, and legislators' offices on the second and third floors would be ready by February 1968 when the Legislature convenes. The upper floors would be completed later that year.

Planning and engineering studies for a transit system for metropolitan Los Angeles are under way, now that initial funds have been made available by the state for the purpose. The funds, hailed as the 'green light' for Los Angeles' much-discussed rapid transit system, will actually cover only development of plans for the system. Financing—estimated at $2 billion—will have to be voted on in November 1968 before actual construction can begin.

Western events

December


January

1 Closing date, exhibitions of work by artist and photographer Man Ray, artist Pablo Picasso, and artist Josef Albers. Los Angeles County Museum of Art, 5905 Wilshire Boulevard, Los Angeles.

February

25-March 1 Nineteenth annual California and Pacific Southwest Recreation and Park Conference. Fresno, California.

ARCHITECTURAL RECORD December 1966 32-5
Steel signs...strength and beauty made possible by corrugated web girder design

PROBLEM: Design a freeway sign that combines maximum readability for safety, new attractiveness for highway beautification, and low costs for production and maintenance economy.

SOLUTION: The California Division of Highways designed this new corrugated web girder sign. The structure is essentially a box girder using formed plate for top and bottom flanges and corrugated steel sheets as web member.

RESULT: A sign which—by design—is more attention-commanding for safety, yet more esthetic and economical, too! Utilizing attractive but low-cost corrugated sheet for integral stiffeners, the design already has been specified for a major new freeway.
This original solution is another example of how imaginative use of steel can result in exciting answers to ordinary problems. The corrugated web girder principle suggests still more possibilities...such as exposed spandrel beams in commercial building...or even use in large bridge girders.

Could you use this corrugated web girder idea in one of your projects? Our Construction Marketing Department frequently helps steel users in the application of steel to designs like this. For detailed technical service, or just an answer to a question, write or call Construction Marketing Department, Kaiser Center, Oakland, California, 94604; telephone 415/271-2824.

New corrugated web girder freeway sign, designed by the California Division of Highways Bridge Department, is specified for use on a new freeway.
The Treacy building is all-electric for a very good reason:

The builder and the owner are the same man.

When building and operating costs both come out of your own pocket, you don't compromise. You build all-electric as Mr. Treacy did. Putting in an electric heating and air conditioning system not only saved plumbing, ducting and space; it gave the architect more latitude. The absence of a boiler, flue stack and combustion air vents, for example, permitted a much more flexible design. The result was a more attractive building for less money.

Operating costs also are low. Only one source of power is needed.

For complete information about all-electric building, write: Southern California Edison Company, Marketing-Engineering, P.O. Box 62, Terminal Annex, Los Angeles 90051.

Southern California Edison

For more data, circle 19 on inquiry card
The third quarter of 1966 closed on a higher note for Western construction. Three large electrical utility contracts—one of them for $150 million—combined to push total contract value up over $900 million for the month of September, 4 per cent ahead of the 1965 amount.

Nonbuilding construction, enjoying its fifth successive large monthly gain (this one a huge 61 per cent over September 1965), is now the strongest category in the West on a cumulative basis. Nonresidential building trended about even with the year-ago amount during September, while residential contracts experienced another sharp decline.

The Western housing slump reached the end of its third year in September. Residential dwelling units were being built at the exceptionally high annual rate of nearly 435,000 units during the third quarter of 1963. They have not come close to that level since. In fact, Western residential contracts have spent every month of 1966 below 1965 levels, and in every month but one, these declines have been in excess of 15 per cent.

Despite these extremely low levels of activity, the unrented and unsold backlogs have still not been worked off. Much to the surprise of housing analysts, third-quarter vacancy rate figures for the West were slightly above second quarter levels for both houses and apartments.

The composite performance of Western nonresidential building trended about even with the September 1965 figure, but this outcome was the result of some wide variations in the behavior of the individual components. Both hospital and social and recreational contracts were more than double their 1965 value. Commercial building gained 14 per cent on the strength of a sharp rise in office and bank contracts. Contracts for industrial plants fell a full 50 per cent, however, and educational and science building declined four per cent.

Cumulatively, the total value of Western construction contracts stood 5 per cent below 1965's figure at the three-quarter mark. This was mainly a reflection of the 22 per cent deficit in residential building. Nonresidential contracts were ahead of the year-ago amount by 6 per cent, while the nonbuilding category gained 9 per cent.

James E. Carlson, Associate Economist
F. W. Dodge Company
A Division of McGraw-Hill, Inc.
WESTERN REPORTS

Estimator's Guide:
Seattle and The Northwest

The Estimator's Guide alternates monthly among four Western areas. The prices at right are compiled from average quotations received by LeRoy Construction Services for commercial work of approximately $100,000-$250,000 total value. Except as otherwise noted, prices are for work installed including all labor, material, taxes, overhead and subcontractors' profit. Material prices include local delivery except as noted, but no state or local taxes.

EXCAVATION

MACHINE WORK IN COMMON GROUND
Large basement ........... CY 90-1.20
Small pits ............... CY 1.50-2.00
Trenches .......... CY 2.00-2.75

HAND WORK IN COMMON GROUND
Large pits & trenches CY 8.75-13.00
Small pits & trimming CY 12.80-17.00
Hard clay or shale, 2 times above rates. Shoring, bracing & disposal of water not included.

SEWER PIPE MATERIALS

VITRIFIED
Standard 4" .................. LF .33
Standard 6" .................. LF .66
Standard 8" .................. LF .96
Standard 12" ................. LF 2.03
Standard 24" ................. LF 8.27

CLAY DRAIN PIPE
Standard 6" .................. LF .33
Standard 8" .................. LF .48
Rate for 100 LF FOB Warehouse

CONCRETE & AGGREGATES

Gravel, all sizes ................. TON 3.75
Top sand .................. TON 4.00
Concrete mix ............... TON 4.10

Cement
Common, all brands (paper sacks) Per sack 1.40
Large quantities Per Bill 4.45
Atria White Per Sack 3.70

Concrete mix
6 sacks in 5-yd loads .......... Per Yd 15.65
Lightweight 6 Sacks .......... Per Cy 21.25

Curing compound
Clear, 5-gal drums ............... Per Gal 1.45

STEEL MATERIALS

Sheets
Hot rolled .................. LB .175
Galvanized .................. LB .175

PLATE
Cold rolled .................. LB .175
Galvanized .................. LB .175

STRUCTURAL SHAPES
Hot rolled .................. LB .175
Cold finished ............... LB .175

REINFORCING MESH
6 x 6" #10 x 10" ............... SF .04
6 x 6" #6 x 6" ............... SF .07
2000# FOB Warehouse

CONCRETE BLOCKS

4 x 8 x 16" .................. EA .25
6 x 9 x 16" .................. EA .32
8 x 8 x 16" .................. EA .34
12 x 8 x 16" .................. EA .52
Add for color ............... EA .02

BRICKWORK & MASONRY

BRICK WALLS
Back Up Common 8" ........... SF 2.00
Back Up Common 12" .......... SF 2.95
S.C.R. 6" .................. SF 2.15
S.C.R. 8" .................. SF 2.65

CONCRETE BLOCK, REINFORCED
6" walls .................. SF 1.35
8" walls .................. SF 1.50
12" walls .................. SF 1.95

GLAZED STRUCTURAL UNITS
Facing 2" .................. SF 2.35
Partition 4" .................. SF 3.75
Partition 6" .................. SF 4.70

BRICK VENEER
4" Select Common ............. SF 1.70
4" Roman .................. SF 1.85
4" Norman .................. SF 1.75

STONE WALLS
Veneer 4" .................. SF 3.45-4.20
Walls 8" .................. SF 7.00-8.50

BUILDING PAPERS & FELTS

BUILDING PAPER
1 ply per 1,000-ft roll .......... 4.30
2 ply per 1,000-ft roll .......... 6.80
3 ply per 1,000-ft roll .......... 8.80
Sisalkraft, reinforced, 500-ft roll 9.50

SHEATHING PAPERS
Asphalt sheathing, 15-lb 324 SF roll 2.20
30-lb 216 SF roll .......... 2.95
Dampcourse, 216-ft roll .......... 3.30

FELT PAPERS
Deadening felt, 3/4-lb, 50-yard roll 3.00
1-lb, 50-yard roll .......... 3.50

ROOFING PAPERS
Standard grade, smooth surface 432 SF roll 2.32
Light, 45-lb .................. 2.75
Medium, 55-lb .................. 2.65
Heavy, 65-lb .................. 2.95
Mineral surfaced 216-ft Roll 3.50

LUMBER
Douglas Fir Construction 2x4-2x10
MDF 94.00-102.00
Standard 2x4-2x10 ...
MDF 99.00-106.00
Utility 2x4-2x10 ...........
MDF 75.00-82.00
Economy 2x4-2x10 ..
MDF 57.00-68.00
Clear, air dried MDF 200.00-240.00
Clear, kiln dried MDF 280.00-400.00

REDWOOD
Foundation grade ..
MDF 150.00
Construction Heart ..
MDF 140.00
A Grade ..
MDF 130.00
Clear Heart ..
MDF 325.00

PLYWOOD (DOUGLAS FIR)
1/4" OSB .................. MSF 95.00
1/4" AD .................. MSF 75.00
1/4" Ext. waterproof MSF 81.00
1/4" AB .................. MSF 109.00
1/4" NM .................. MSF 119.00
1/4" CD .................. MSF 99.00
1/4" HD .................. MSF 90.00
1/4" AC .................. MSF 145.00
1/4" MC .................. MSF 150.00
1/4" MT .................. MSF 124.00
1/4" KD .................. MSF 100.00
1/4" MB .................. MSF 165.00
1/4" CD .................. MSF 140.00
1/4" CC .................. MSF 175.00

SHINGLES
Cedar #1 .................. Square 17.00-19.00
Cedar #2 .................. Square 14.00-17.00

SHIMES

Cedar to 3/4 inch .......................... SF 3.50-4.25
Cedar to 1/2 inch .......................... SF 2.25-2.75

SHAKES

Cedar

INSULATION & WALL BOARD

FIBRE GLASS INSULATION foam backed
Per MSF
1/8" thick .................. 41.00
1/4" thick .................. 50.00
3/8" thick .................. 59.00

SOFTBOARDS—wood fiber
1/8" thick .................. 50.00
1/4" thick .................. 60.00
3/8" thick .................. 120.00

ALUMINUM INSULATION
354 Kraft paper with aluminum foil 1 side only 24.00
2 sides ....... 30.00

GYPSUM WALLBOARD

Cement
1/4" thick .................. 51.00
1/2" thick .................. 62.00
1/2" thick .................. 80.00

HARDBOARDS—wood fiber
1/8" thick, sheathing ....... 85.00
3/16" thick, sheathing .......... 73.00
1/4" thick, sheathing .......... 85.00
1/4" thick, tempered .......... 80.00
3/16" thick, tempered .......... 130.00

CEMENT ASBESTOS BOARD
1/8" flat sheets .......... 135.00
3/16" flat sheets .......... 182.00
1/4" flat sheets ........... 238.00

ROUGH CARPENTRY

FRAMING

Floors ........... BM 26-32
Walls .......... BM 33-44
Ceilings .......... BM 35-44
Roofs .......... BM 28-34
Furring & blocking .......... BM 45-70
Bolted framing, add 59%

SEATING

1 x 8" straight .............. BM 23-29
1 x 6" diagonal ............... BM 26-32
3/4" plywood .................. BM 29-32
7/8" plywood CC .......... SF 28-33

SIDING

1 x 8" bevel .......... BM 47-52
1 x 4" X-4 siding .......... BM 52-62
Bolted framing add 59%

DAMPROOFING & WATERPROOFING

MEMBRANE

1 layer SBS felt ........ SQ 10.00
4 layers SBS felt .......... SQ 15.00
Hot coat walls .......... SQ 10.00
Trisocal added to concrete .... 1.00
Aqu-Hydro added to concrete .... 1.00

ROOFING

Asphalt & Gravel Per Sq

Felt .......................... SF 17.00-21.50
5 ply .................. SF 19.00-24.00
White gravel finish—Add 2.00-4.00
Asphalt compo. shingles .. SF 25.00-30.00
Cedar shingles ........ SF 25.00-32.00
Cedar shakes ........ SF 28.00-35.00
Concrete tiles .......... SF 45.00-65.00
Clay tiles .................. SF 50.00-60.00

ROOF FLASHING

18 ga galval steel ........ SF 85-130
22 ga galval steel .... SF 75-125
26 ga galval steel .... SF 65-110
28 ga aluminum ........ SF 135-185
22 ga aluminum .......... SF 115-130
26 ga aluminum .......... SF 105-115
16 oz copper .......... SF 190-245
20 oz copper .......... SF 220-280
24 oz copper .......... SF 230-295
26 ga galval. steel ........ SF 151-215
Mitre and Degas .......... EA 2.25-4.25
22 ga galval. louveres SF 3.75-4.75
22 oz copper louveres SF 4.50-6.00

32-10 ARCHITECTURAL RECORD December 1966
WOOD
1 x 12
Select Oak
1/4" grade
25/32"
Maple
25/32"
Wall hung
Casement sash &
Counter
D.F. wall hung
Wood cabinets
1/4" D.F. plywood
with
Plywood backs:
Wall hung
Counter
 Birch or maple, add 25%

FINISH CARPETING
EXTERIOR TRIM
Fascia and moldings
BM .75
2 1/2" Molding
BM .95
INTERIOR DOORS & FRAMES
Singles
60.00 & up
Doors
100.00 & up
INTERIOR DOORS & FRAMES
Preset
17.00 & up
Singles
36.00 & up
Pocket sliding
45.00 & up
Closet sliding (Pr.)
55.00 & up

WINDOWS
D.H. single frames &
sashes
2.00 & up
Casement sash &
sashes
2.25 & up
SHELVING
BM .40
1/4" plywood
BM .45-65

STAIRS
Oak steps, D.F. risers
Under 36" wide
Riser 14.00
Under 60" wide
Riser 19.00
Newel posts and rail extra

WOOD CASES & CABINETS
D.F. wall hung
17.00-20.00
D.F. counters
18.00-30.00

HARDWOOD FLOORING MATERIALS
OAK 25/32" x 2" T &G
Select
M 245.00
#1 Common
M 190.00
MAPLE 25/32" x 2" T &G
#2 Grade
M 305.00
#3 Grade
M 280.00
NAILS-1" FLOOR BRADS
KEG 18.00

HARDWOOD FLOORS
Select Oak
Filled, sanded, stained and
varnished
25/32" x 2 1/4" T & G
.75...
.95...
Wax finish, add

SMOOTHING

RESIDENTIAL FLOORING MATERIALS
Linoleum, standard

gage

Linoleum, battleship

1/4" Asphalt tile, dark

1/4" Asphalt tile, light

.001 Vinyl Asbestos tile

.001 Vinyl Asbestos tile

.001 Vinyl tile

4" base

Rubber treads

Linoleum paste

RESIDENTIAL FLOORING
1/4" Asphalt tile, dark

1/4" Asphalt tile, light

1/4" Vinyl tile

Linoleum, standard

gage

LINOLEUM, BATTLESHIP

STEEL LATH & PLASTER

METAL LATH & STUCCO

STEEL SASH

UNDER 10

UNDER 15

UNDER 20

UNDER 30

ALUMINUM SASH

UNDER 10

UNDER 15

UNDER 20

UNDER 30

Priced per floor.
Add 15-30%

GLASS—CUT TO SIZE

FOB WAREHOUSE

CERAMIC TILE

4 x 1/4" glazed

4 x 1/4" hard glazed

Random, unglazed

6 x 2" cap

6" Cove base

1/4" round bead

QUARRY TILE

6 x 6 x 1/2" red

6 x 6 x 1/2" green

6 x 6" Cove base

TILE & TERRAZZO WORK

TERRAZZO FLOORS

STEEL SASH

UNDER 10

UNDER 15

UNDER 20

UNDER 30

ALUMINUM SASH

UNDER 10

UNDER 15

UNDER 20

UNDER 30

PAINT MATERIALS

All prices FOB Warehouse

Thinner 5-100 gal

Turpentine 5-100 gal

Linseed oil, raw

Linseed oil, boiled

Primer-sealer

Enamel undercoaters

Enamel

White lead in oil

Red lead in oil

Litharge

PAINTING

EXTERIOR

Stucco wash, 1 coat

2 coats

Lead & Oil

2 coats

INTERIOR

Primer-sealer

Wall paint, 1 coat

2 coats

Enamel, 1 coat

2 coats

Sash & trim

Base & molds

VEGETABLE BLINDS

RESIDENTIAL

COMMERCIAL

VERTICAL

PLUMBING

Lavatories

Toilets

Bathtubs

Stall showers

Sinks

Laundry trays

Water heaters

Prices based on average residential and commercial work. Special fixtures and excessive piping not included.

HEATING

Furnaces—Gas-fired, Average Job

FORCED AIR FURNACE

60,000 BTU

80,000 BTU

120,000 BTU

Automatic control, add

add

DUAL WALL FURNACE

25,000 BTU

35,000 BTU

50,000 BTU

Automatic control, add

GRAVITY FURNACE

Outlet

ELECTRIC WIRING

Per Outlet

Knob & Tube

Armors

Conduit

110-V Circuit 3 wire

220-V Circuit Range

ELEVATORS & ESCALATORS

Prices vary according to capacity, speed, and type.

Consult elevator companies.

Slow speed apartment house elevators including doors and trim about

$4,000 per floor.
How Much Will it Cost?

It is common practice for the architect to employ consultants to advise on factors in the design of a project that requires a highly specialized knowledge.

One of the most important and most difficult of these to assess is the final cost.

The estimate of the cost of a building complex is a task that can be performed properly only by specialists who have been trained for it and who have practised both in the field of professional quantity surveying and in the estimating departments of general contractors’ offices.

LeRoy Construction Services employ staff with this training and experience and offer a service that covers the full range of estimates, from those for comparative and preliminary purposes to fully detailed and priced final cost estimates.

LeRoy Construction Services
Quantity Surveyors & Estimators

768 BRANNAN STREET
SAN FRANCISCO 3
UN 1-2483
Here's DENSYLON—
the new floor covering that's obsoleted tile and carpet for high-traffic areas
Engineered for commercial use with A.C.E.® nylon

Not only is our revolutionary new DENSYLON® different than any other kind of floor covering—it's better.

Better for every area of every kind of building—schools, hospitals, offices, restaurants (even restaurant kitchens!).

Easier maintenance is one reason. Dirt, grime, or soil can't penetrate DENSYLON's extra-tight-twist, high-density nylon pile. Any kind of spillage—fruit juice, honey, even hot grease—wipes right off with a damp sponge. DENSYLON vacuums clean as new with half the strokes required by carpet. And the savings on never having to scrub or wash or wax a bare floor will pay for a DENSYLON installation in just a few years!

Superb appearance is another reason. DENSYLON comes in a broad range of handsome colors and patterns. It has all the warmth and luxury of carpet—but none of its disadvantages. And, unlike tile, DENSYLON can't be marred, or scratched, or dented. Even by spike heels or heavy fixtures.

For comfort and quiet, DENSYLON is permanently and integrally bonded to a 3/16" B. F. Goodrich sponge-rubber backing (note—that's sponge, not foam.) It carries a lifetime guarantee. DENSYLON can never ripple or buckle. Big benefit: when things (or people) fall, they land on a cushion.

Finally, there's wear. Or rather, no wear. Because no DENSYLON installation has ever worn out. Even at the G.E. World's Fair Exhibit where 15 million people trudged over DENSYLON, DENSYLON can be put in the heaviest traffic areas without showing "traffic lanes."

CCC is the world's largest exclusive manufacturer of commercial carpet. We make miles and miles of conventional carpet. Every fiber, every construction. For those areas that require conventional carpet, we recommend it. Now we're making miles and miles of DENSYLON. For where tile used to go. For where carpet never could.

We have the industry's largest staff of floor-covering specialists out in the field. One of them will be happy to explain why revolutionary new DENSYLON is making everything else obsolete. Or, we'll mail you the facts. Use the coupon. Now.

*CCC's trademark for its sponge-bonded, high-density nylon carpet


For more data, circle 20 on inquiry card
MAKE YOUR OWN INSULATION TEST:

Take Permalite Masonry Fill...add water...let it stand...6 hours, 6 days or 6 years...SHAKE IT...

Permalite
Silicone-Treated
Fill stays dry

This simple, desk-top test shows why Silicone-Treated Perlite Fill is the ideal insulation for cavity wall construction.

Positive proof comes from an independent laboratory test* : A specially-built cavity wall system insulated with Silicone-Treated Perlite Fill was blasted with the equivalent of a 5½"-per-hour rainstorm, driven by 50 mph winds for 6 straight days. The exterior wall leaked. The interior wall STAYED BONE DRY.

Insulation was provided by a mere 2½ inches of Perlite Fill. It absorbed only 2.14% of its weight...the lowest of any inorganic insulating fill...five times better than the next best material.

In addition, Perlite Fill is easy to pour in place; won't bridge, settle or pack; is fire-proof and rot-proof. Saves money, too. Heat transfer is reduced more than 50%.

Try this desk-top insulation test yourself. Your local Permalite man will be delighted to bring you jars and Fill to show you first hand how Silicone-Treated Perlite really repels water. Call him today or write for Technical Bulletin MF-2.

*Structural Clay Products Research Foundation.
President signs important bills; names transportation head

In a series of important actions last month, President Johnson signed the Demonstration Cities Bill, a higher education bill, and a bill expanding last year’s elementary and secondary school act (November, page 35). The President also named Alan S. Boyd to head the new Cabinet-level Department of Transportation. The new department will be the fourth largest Federal agency, but will not oversee mass transit, which remains under the jurisdiction of the Department of Housing and Urban Development. Mr. Boyd, former chairman of the Civil Aeronautics Board, was at the time of his appointment Under Secretary of Commerce.

HUD will name advisory panels for its major field offices

Seven four-member interprofessional panels will be named soon for the major field offices of the Department of Housing and Urban Development. Each panel will be made up of a representative of the American Institute of Architects, the American Institute of Planners, the American Society of Landscape Architects, and a member representing the engineering profession.

This new interprofessional cooperation with HUD follows an interprofessional evaluation of HUD’s programs by 80 professionals from the fields of architecture, landscape architecture, planning and engineering. George T. Rockrise, adviser on design to the Secretary of HUD, initiated the idea. Purpose of the evaluations was to help HUD modify and improve its services, with the aim of improving the total environment.

Andrew Euston Jr., director of urban programs for the American Institute of Architects, served as coordinator, receiving information from the selected individuals, members of such organizations as the A.I.A., A.I.P., A.S.L.A. and A.S.C.E.

The advisory design panels and the HUD evaluation program are the most recent manifestations of interprofessional cooperation within HUD since Mr. Rockrise’s appointment. Underlying this interprofessional effort is the reorganization of government action in these fields with the establishment of HUD and the new Department of Transportation, both of these agencies seeking to deal with problems comprehensively on a multi-disciplinary level.

Important meetings preceding these recent events included a conference at the Octagon on August 24 and 25, between HUD officials and the A.I.A., A.I.P., A.S.L.A., and A.S.C.E., and a meeting on September 15 in Washington of organizations representing the design professions, which have recently established the Interprofessional Commission on Environmental Design.

“Synchroveyor” is proposed to ease urban congestion

A fifth-year architectural student at the University of Illinois, Urbana, Larry S. Bell, has proposed a new type of horizontal transportation system for areas of high urban density—the main purpose of the system being to reduce vehicular traffic. The “synchroveyor,” as the system is called, is electrically powered, conveying circuits which are synchronized to allow passengers to interchange from one circuit to another. There are two types of conveying circuits: one that operates at variable speeds between standstill and 30 miles per hour, for local traffic; and one that operates at a constant speed for express traffic. Loading and unloading on variable speed circuits is accomplished by means of rotatable transfer decks, revolving to interchange groups of people by a “lazy susan” principle. When the variable circuit reaches the same speed as the constant speed circuit, transfer from local to express can be made by a method similar to loading and unloading, thus allowing flexibility of destination within the system. Synchroveyors are conceived as underground or elevated systems. Mr. Bell was aided in developing his scheme by Professor Wayne Adkins of the University of Illinois department of mechanical engineering and by George G. Dodd, former research associate and instructor in electrical engineering, University of Illinois.

HUD awards program honors intergovernmental actions

The Department of Housing and Urban Development through the Urban Development Intergovernmental Awards Program will recognize “superior, cooperative achievements between local governments and actions to improve state-local relations which further the national objective of helping to improve the living environment of our citizens.” The awards in this first program will be presented this month at the National League of Cities Annual Congress. Eligible for participation were: any local governmental body, organization of elected officials, units of government acting jointly, regional bodies and state governments.

“As we approach more and more of our urban problems in depth,” said H. Ralph Taylor, Assistant Secretary for Demonstrations and Intergovernmental Relations, “we realize the paramount importance of practical intergovernmental relationships that can result in productive actions. That is why we want to recognize and encourage more of this kind of local and state activity and broadcast their success to other communities with similar urban problems.”

Ketchum given French award in the field of humanities

Morris Ketchum Jr., architect and past president of the American Institute of Architects, has been named a “Chevalier de l’Ordre des Arts et Lettres”, the highest honor bestowed by the French government in the field of humanities. Mr. Ketchum, the first American architect to be so honored, was cited for his “international leadership in the architectural
profession, creative accomplishments in the field of urban design, and high esteem in which he is held by his professional counterparts in France.

Museum is proposed to house kinetic art

A gigantic concrete structure, 400 by 500 feet, designed by architect Roger Katan with sculptor Len Lye, would house all types of kinetic art, at a site yet to be determined. The four-level building would be organized around a great central hall which would house Len Lye’s enormous project Sea Serpent, a series of stainless steel strips in violent motion and musical cacophony (see interior model photo on page 5). The spectator would enter through a “funnel of sound” (at bottom in photograph at left), and would be led through a series of displays in controlled environments in the four levels surrounding the great hall, as well as a roof level for display of sculpture and water-sculpture in a large pool.

The work of Gio Ponti displayed at U.C.L.A. show

An exhibit of the work of Gio Ponti, Milanese architect and designer, will continue through December 11 at the U.C.L.A. galleries, Dickson Art Center, Los Angeles. The exhibit includes business, residential, educational, and religious architecture; furniture, glass, silverware, stage and industrial design; and city planning concepts, paintings and drawings. The exhibit will be circulated to universities throughout the country.

H. Judd Payne is dead at age 66

H. Judd Payne, former vice-president of the Magazine and Book Division of F. W. Dodge Corporation (now a division of McGraw-Hill, Inc.) and publisher of ARCHITECTURAL RECORD from 1939 to 1959, died October 25 at age 66. Mr. Payne, an M.I.T. graduate, joined McGraw-Hill in 1923 as an assistant editor of Chemical & Metallurgical Engineering, and from 1929 to 1939 was with Associated Business Publications, the last four years as its executive vice president. During the period when Mr. Payne was publisher, the RECORD attained the largest circulation among architects and engineers concerned with building design, and also became the largest medium for architectural advertising. Mr. Payne had lived in Bernardston, Massachusetts since his retirement in 1962.

Nuns' Island new town will house 50,000 on site adjacent to downtown Montreal

A $300-million project to create a urban community of 50,000 on Nuns' Island, a 1000-acre tract in the St. Lawrence River, minutes from Montreal, is now underway with a landfill operation and installation of water and telephone services. Construction will start on the first residential community this spring, this phase consisting of 800 townhouse and apartment units and costing $15 million. More than 100 of these units will be completed by October, 1967, with all 800 units scheduled for completion by May, 1968. Total development of the island will take from 12 to 15 years.

Master plan for the site was developed by Johnson, Johnson & Roy of Ann Arbor, Michigan. The first 12-story high-rise unit is being designed by Mies van der Rohe; medium height units are being designed by Philip David Bobrow; and townhouses are being designed by Stanley Tigerman. Water and other utilities are being planned by La Societe B.L.M., a joint venture of three engineering firms: Beauchemin-Beaton-Lapointe; Lalonde, Valois, Lamarre, Valois & Associates; and Moffatt & Nichol. Traffic consultant is Barton-Ashman Associates, and ecological consultant is Calvin R. Fleming. The island was purchased in 1956 by the Quebec Home and Mortgage Corporation Ltd. from the Sisters of the Congregation of Notre-Dame who had used the island as a retreat during the 19th century and the first half of the 20th century. A 99-year lease to develop the island was signed last year by Metropolitan Structures of Canada Ltd.

The island first became accessible to downtown Montreal with completion of the $30-million Champlain Bridge in July, 1962. Primary access will be by the La Route expressway to the core of Montreal, scheduled for completion early next year. Bus transportation will link the island to the new Montreal subway which was completed earlier this fall.

The master plan calls for a central parkway system to define three residential communities and a town center. The residential communities and town center are being individually developed in areas of 150 to 200 acres. Each community is organized around a central park which relates to the parkway on the interior and the water’s edge on the exterior. Schools, services and recreational facilities will be located in the central park. A series of smaller open spaces will be related to the central park by pedestrian greenways.

Primary roads within each community will handle local traffic, public transit, and service. Secondary streets have cul-de-sacs and serve individual neighborhoods. Each community is composed of neighborhood units for 1,500 to 2,000 residents composed of building clusters housing 400 to 600 people. The building clusters will enclose a large pedestrian green or common. Parking space is provided under the buildings to keep the common as large as possible. High-rise structures will be located on the water’s edge, related to a series of urban plazas to link waterfront activities with the center.
Shown above is Deco-Grid style Borden Decor Panel used as a facade for the Pargas, Inc. building in Waldorf, Maryland. Set off by piers of white precast stone, the sturdy aluminum Deco-Grid panels are finished in blue HINAC, Pennsalt’s new finish for metals.

This Deco-Grid installation has tilted spacers, a feature called the Slant-Tab variation wherein spacers may be mounted at angles of 30°, 45°, 60° or 90° as desired. The Slant-Tabs may be further altered by use of non-standard angles, or lengthened tabs.

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The Beach Avenue apartment building, Vancouver, British Columbia, designed by C. B. K. Van Norman & Associates, provides 90 de luxe apartments in a 26-story structure. The building slopes upward to provide garden-terraces. The high concentration of units at the bottom of the structure allows every apartment to have a water view. Parking for 150 cars is located at the rear of the base. The first four floors will be a series of two-story townhouses with private entrances. Consulting engineers for the reinforced concrete, $2-million project are Kirwan and Chercovar.

A public housing project at Cermak Road—State Street, Chicago, designed by Bertrand Goldberg & Associates (January, pages 158 and 159) is now completed. The project combines housing for the elderly with family housing in four buildings in a landscaped setting. A sunken amphitheater seating 1,000 is a central meeting point for elderly and young families. The elderly are housed in two identical 16-story round towers with 182 units in each building. Families are housed in two 22-story crescent-shaped structures with 168 units in each building (photograph of balcony, above right). General contractor was Paschen Contractors Inc.
The Kline Biology Tower, Yale University, New Haven, designed by Philip Johnson and Richard Foster (the 100-year-old Peabody Museum of Natural History is in the foreground), has recently been dedicated, thus completing the Kline Science Center complex designed by Mr. Johnson. The $12-million, 14-story tower, of reinforced concrete construction, and will, according to the architects be “compatible with the New Academic” of nearby Harvard and M.I.T. The 100,000-square-foot complex will contain in its 11,000-square-foot core building 203 rooms, including 27 two-room suites with balconies. Also included will be a 200-seat glass-enclosed restaurant overlooking the Charles and a 300-seat meeting room. General contractor is the E & F Construction Company.

A high-rise motor hotel overlooking the Charles River, Cambridge, Massachusetts, designed by Salsberg & LeBlanc for the Sage Hotel Corporation, will be of brick, concrete and glass construction, and will, according to the architects be “compatible with the New Academic” of nearby Harvard and M.I.T. The $3-million, 15-story structure will contain in its 11,000-square-foot core building 203 rooms, including 27 two-room suites with balconies. Also included will be a 200-seat glass-enclosed restaurant overlooking the Charles and a 300-seat meeting room. General contractor is the E & F Construction Company.

The Citizens & Southern National Bank and office building, Atlanta, designed by Aeck Associates, provides 110,000 square feet of office space in a circular tower and banking facilities in an adjoining low circular building. In the office tower, the floors are suspended 52 feet above the street from steel trusses which are in turn supported by the concrete silo core. Why a circular shaped tower? “It avoids an ‘alley’ which would have resulted between the surrounding buildings and a square or rectangular shape,” says the architect. The banking structure provides five drive-in windows below a banking floor at roof garden level. A separate garage will hold 350 cars. General contractor is Beers Construction Company.

An office building in San Francisco for the Mutual Benefit Life Insurance Company, designed by Welton Becket Associates, is supported by 4-foot-10-inch-wide prestressed concrete columns framing bronze-anodized aluminum windows twice as wide as the columns. The 32-story office tower will contain 575,000 square feet of office space with parking in the basement, and a two-story annex will contain 15,000 square feet of office space. The entire weight of the structure will be borne by the outside columns and the central elevator shaft, providing column-free interior space. General contractor will be Haas & Haynie Corporation.
St. Bartholomew's Episcopal Church, Livermore, California, designed by Ian Mackinlay and Associates, will seat 300 people in a central plan structure. The entire interior space is focused on the altar with the pulpit placed behind it on axis with the main doors. The structural system, the architect says, “avoids all view-obstructing posts by the use of heavy wooden trusses cantilevered from a concrete ring beam on concrete pillars. These pillars also define the ‘back aisle.’ The trusses are held down by steel tension members in the exterior wall and rise up to a central skylight which catches the sunlight, diffuses it through a hanging baldechino of wood slats and directs it onto the altar.”

The Religious Center and Chapel at Inter-American University, San German, Puerto Rico, designed by The Perkins & Will Partnership with David P-C Chang and Lorenzo Ramirez de Arellano, associate architects, groups buildings for various related functions around a landscaped courtyard. The octagonally-shaped main chapel will seat 350, and its spire will rise 100 feet. In the foreground of the photograph is a fellowship hall seating 200. Other structures enclosing the courtyard are a smaller chapel which will seat 50, a unit containing seminar and conference rooms, an office element containing seven offices and a lounge, and a structure housing classrooms.

St. Paul's by-the-Sea Episcopal Church, Jacksonville Beach, Florida, designed by Ellis, Ingram and Associates, has “a form related to the sea—and to the church.” The structure, which will seat 400 and cost approximately $275,000, is built of load-bearing walls poured with coquina (seashell) concrete exposed on the surface by a retarder in the framework. The highest wall rises to a height of 50 feet with the top of the Cross 120 feet above ground level. General contractor is Wesley of Florida Inc.
The Santa Rosa, California City Hall, designed by De Brer, Bell, and Heglund, winners of a regional competition for design of the structure, places municipal departments in separate buildings at various levels connected by a ramp system that culminates at the council chamber. The complex will enclose a public courtyard dominated by a tall sculptured element which serves as a symbolic point of reference. The council chamber is located behind the sculptured element in the photograph above. The first phase of this complex (shown above), will serve a present population of 42,000, and provide 48,000 square feet. Each of the departments is independently expandable, and totally new departments can be added. The primary construction material is concrete.

Robert D. Harvey

The Georgetown University Library, Washington, D.C., designed by John Carl Warnecke and Associates, will hold 1 million volumes and will seat 1,800 students. A key design objective was to relate the structure to existing quasi-Gothic structures, and this was accomplished by extending the stair towers and supporting columns to give a vertical emphasis. The exposed dark gray granite aggregate in the poured-in-place concrete further relates the new structure to the dark gray granite older buildings. The structure, which will cost $5 million, has five library levels, will be 80 feet high, and will have underground parking for 100 cars.

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The Montego Bay Hospital, Montego Bay, Jamaica, designed by The Architects Collaborative, John C. Harkness, partner in charge, is a 400-bed general hospital which forms the nucleus of a ring of smaller "cottage" hospitals in the surrounding area. The hospital has two wings: a 10-story in-patient wing and a low three-story out-patient wing. Supplementary facilities include government health offices for the area, a training school for nurses and staff housing. Associate architects are Chalmers, Gibbs & Associates. Completion is set for 1968.

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Industrial construction: too much too soon?

Has industrial construction, with its phenomenal 15 per cent-a-year growth rate, managed to get too far out of line with the demand for manufactured goods? Over the past several years, the nation's manufacturing plant capacity has been increased and modernized considerably. Nearly one-fifth of today's total available plant space has been built within the past five years. But at the same time, actual manufacturing output—in physical terms—has increased by over 40 per cent. In other words, the gain in output of manufactured goods since 1961 has been actually twice the increase in available plant capacity.

It's obvious that some other factors besides just the addition of new factory space are at work here. For one thing, back in 1961 many factories had idle capacity; today most plants are operating at their practical limits. Taking up the slack that existed back '61 has alone accounted for about one-fifth of the growth in manufacturing output over the five year period.

Another very important source of growth in the volume of manufactured goods has been the steady gain in productivity. With more efficient machinery and newer and better-designed plants, as well as a more highly-skilled work force, we continue to produce more goods each year per unit of factory space. It is estimated that productivity gains arising out of these qualitative changes have accounted for as much as two-fifths of the total growth in factory output since 1961.

The remaining two-fifths of the 40 per cent increase in manufacturing output over the past five years (i.e., growth of between 15 and 20 per cent from the 1961 level) is the part that can be attributed to the actual increase in the quantity of productive factors—labor, machinery, and plant. And in this sense, the expansion of the nation's plant capacity during this period has been highly consistent with the growth in output, for capacity has also been increased by something between 15 and 20 per cent.

This pattern of balanced growth of capacity and output has to be tempered by the fact that further expansion of manufacturing capacity is very much dependent upon continued growth in the demand for manufactured goods. Even a leveling off in final demand would call for a sharp decline in new plant construction, since existing capacity is entirely adequate to maintain the present volume of output.

According to the just-released McGraw-Hill survey of business' plans for capital spending, manufacturers are anticipating a 6 per cent increase in the physical volume of their sales next year—about two percentage points less than the 1966 gain. What's more, the suspension of the 7 per cent tax credit and accelerated depreciation have prompted a $1 1/2-billion slash in previously planned capital outlays. Tight money and narrowing profit margins are additional deterrents. On balance, the survey indicates that manufacturers plan a much smaller increase in total capital spending next year—about 6 per cent, against this year's 21 per cent.

Thus it would seem that there will be a noticeable slowing in the sharply upward trend of new plant construction in 1967, not because of any past excesses, but because of growing reservations on the part of businessmen about the near future.

George A. Christie, Chief Economist F. W. Dodge Company A Division of McGraw-Hill, Inc.

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

William H. Edgerton
Manager-Editor, Dow Building Cost Calculator, an F. W. Dodge service

DECEMBER 1966 BUILDING COST INDEXES

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Differences in costs between two cities may be compared by dividing the cost differential figure of one city by that of a second; if the cost differential of one city divided by that of a second (8.0) equals 125%, then costs in the first city are 25% higher than costs in the second. Also, costs in the second city are 20% of those in the first. (8.0/8.0=100) or they are 20% lower in the second city.

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

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

ARCHITECTURAL RECORD December 1966
Educational advance:

Mr. Frank W. Wallace, A.I.A., Tulsa, Oklahoma

This new university supplies all its energy needs with Solar Gas turbines.

Closed circuit TV and push-button audio visual aids are just a sample of Tulsa's advanced new Oral Roberts University plant. On the economy side: a Gas Total Energy system.

Two Solar 1100 hp gas turbines drive electric generators for all the lighting and other power needs. They also energize exhaust heat boilers to provide heating and absorption-chiller cooling. Temperatures are regulated from a central control. Electrical controls are unattended. And the big advantage: low operating costs, proven during the past year's service, will offset system expenditures in 5 years.

When the current Oral Roberts University campus of 7 buildings is expanded, the system will grow along with it...using three more Solar gas turbines. Learn more about Solar and Gas Total Energy. Call your local Gas Company Sales Engineer. Or write: Solar, a Division of International Harvester Company, Dept. 0-500, San Diego, California 92112.

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SPARKLE! Flair fittings add the crowning touch to Kohler fixtures. Great with the new accent colors!

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Ideas behind modern architecture


This is a notable book in that it contains the personal views of architects—on architecture. It was brought about through interviews with leading architects who have spoken on their design approach, their ideas and their work. To their statements the author has added definitive remarks.

The studies are individual but in a larger sense this is a vigorous study of the general directions American architecture has taken. Splendid photographs add graphic awareness. The architects' accounts give life to their work and undoubtedly will be a useful record for future generations of architects and scholars.

The discussions begin with Mies who said, "All individualism is a left-over from the time of Luther—when he said: 'Here I stand.' I would look for more profound principles. . . Since the authentic approach to architecture should always be the objective, we find the only valid solutions in those cases where objective limits were imposed and there was no opportunity for subjective license."

Jacques Brownson, once a student of Mies, stated, "We are creating buildings today that were never thought of before in terms of use, and we are going to arrive at other new building types. Significantly, Mies was interested in analyzing how to develop different building types. One of his greatest proposals was the unconstructed Chicago Convention Center. His concern was with the use of such a building, an approach to building types rather than to an individual solution."

Pietro Belluschi's statements include: "My approach to architecture is based on the three great principles of clarity, proportion (not in the classical sense, but the proportion of things in relation to themselves) and integrity. I am committed to a philosophy of simplicity, of understatement, but that of the saint, rather than that of the fool. It comes from deep understanding and purification. . . . To search for the solution in an abstract way is very tempting but only a few extremely gifted, elected architects can do it. Even when they are gifted, they too fall on their face."

Walter Gropius says, "You know that I, for my part, have always been identified since the early 1920's with the idea of 'functionalism' as the only straight and narrow line to take us into the future. But in the interpretation of those with only sectorially-developed minds, this line had become indeed so 'straight and narrow' that it led straight into a dead end. Its original complexity and psychological implications, as we developed them in the Bauhaus, were forgotten, and it was decrized as a simple-minded, purely utilitarian approach to design, devoid of any imagination that would give grace and beauty to life. To this I can only say: The revolution of the 1920's was total and moral, and its creators looked at beauty not as something self-consciously 'added on,' but as something that was believed to be inherent in the vitality, appropriateness, and psychological significance of a designed object. . . . If our early attempts looked somewhat stark and sparse, it is because we had just found a new vocabulary in which to speak out, and this we wanted to set in the greatest possible contrast to the over-stuffed bombast that had gone before. Besides, we were often held down to a minimum of expenditure by a public which could be sold on modern architecture only when it promised to be cheaper, because it did not yet recognize its esthetic qualities."

From Joseph Escherick, "There is a new cult in architecture, for the most part subjective and trivial, that concerns itself only with esthetics; beauty for beauty's sake, at all costs and no matter how arrived at. Beauty is a consequential thing, a product of solving problems correctly. It is as unreal as the goal. Pre-occupation with esthetics leads to arbitrary design. No successful architecture can be formulated on a generalized system of esthetics; it must be based on a way of life." And Craig Ellwood indicates, "Discipline is the key word. The moment form becomes arbitrary, novel or stylish, it becomes something other than true architecture. . . . In nature, form and structure are one, and this should also be true in architecture. Nature is simple, but unfortunately it does not simplify. It
A hospital floor that doesn’t need special treatment.

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30 years of continued use in the older buildings of the Rancho Los Amigos Hospital, Downey, California, have proved the strength and durability of oxy flooring. Recently, 54,937 additional feet were installed on the stairways, in the operating rooms, recovery rooms, waiting rooms, corridors, and the main lobby of the new clinic building.

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is up to us to search for this simplicity, to express logic and clarity, and to understand structure."


From these pertinent discussions on the beliefs of architects one can see the general directions American architecture is taking. Without doubt this book is useful, because it gives a penetrating view of American architecture at the present.

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**A future for slums?**

**THE TENEMENT LANDLORD.** By George Sternlieb. Urban Studies Center, Rutgers, The State University, New Brunswick, N.J. 269 pp., illus. No charge.

The magic is gone out of urban renewal. Today the cry is, often, for rehabilitation. But rehabilitation for whom, by whom and at what cost?

The Tenement Landlord is not a book “for architects.” But it is for the architect who wants to answer these questions realistically, or who is hunting for criteria so that he can formulate his position about rehabilitation.

The slum landlord is important to an understanding of the natural forces against rehabilitation. It is through knowing the fears and motivations of the landlords that the realities of tenement resale and rental markets will be appreciated, and on such facts that federal and municipal rehabilitation programs and expectations should build in order to avoid disappointment and costly errors. Tax, finance and mortgage data on 366 parcels in Newark, New Jersey, were obtained, and in-depth interviews with more than 300 owners of the properties conducted. Dr. Sternlieb says when he defines the purpose of his study, what is “the optimum bundle of carrots and sticks with which to secure upgrading of slum housing”? Two factors that cut across the categories set the scene. First, only 20 per cent of owners sampled get three-quarters or more income from slum properties. Most have outside occupations. To a number, slum income is a trivial proportion of their total capital or income. Some are stuck with unwanted properties; and “Shaking these owners loose from their lethargy and making them aware of possible government programs for aiding rehabilitation is perhaps more difficult than doing the equivalent for the full-time real estate owner,” Dr. Sternlieb says. Second is the fact that the slum owner typically owns nothing other than slums. About 78 per cent are in this category. "Government programs which might appeal [to the non-slum owner] may have no effect on slum owners . . .”

Although those working with urban renewal have noted the phenomenon, Dr. Sternlieb’s book contributes to exploding the myth that slum lords dominate slums: 43 per cent of owners have one parcel and 22 per cent two or three parcels more. Only six landlords interviewed own more than 40 parcels, and two of this group hold, together, 200
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what did the architects who designed these buildings do above and beyond the call of duty?

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Skidmore, Owings & Merrill
Wisconsin State Teachers College
Sandstedt, Knoop & Yarbro
Arkansas State Hospital—Little Rock
Wittenberg, Delaney & Davidson
McGhee Tyson Airport—Knoxville
Baumann & Baumann, Inc.
Daniel, Mann, Johnson & Mendenhall
Smithsonian Institution—Washington
Mills, Peticard & Mills
Stonewood Shopping Center—Downey, Calif.
Charles Luckman Associates
New York Medical University—Cohen Research Building
Rogers & Butler
Municipal Convention Hall—Cleveland
Outcalt, Guenther, Rode & Bonebrake
Bloom Township High School—Chicago Heights
Childs & Smith
St. Joseph’s Hospital—Chicago
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They go to great lengths in Tulsa to house expositions

World's largest cable-supported roof—404' x 1200'—is Inland Acoustideck

Talk about thinking big—there are 10 1/2 acres of clear-span space under the Inland Acoustideck roof of the new Exposition Center Building on the Tulsa State Fairgrounds!

Structural framing of the building consists of two symmetrical cantilevered halves supported by steel cables. Principal structural members are shop-welded steel box columns and girders. Lightweight beams span between the girders.

Inland type N Acoustideck spans the 13' 10" between these beams. The inherent diaphragm action of the deck provides lateral bracing for wind loads, thus eliminating the need for extraneous X-bracing.

Acoustideck was a logical choice for this suspended roof system, because it weighs less than half of equivalent poured-in-place or precast construction—and carries normal loads over greater spans. The roof on the Tulsa Exposition Center is designed for a snow load of 20 psf. Because Acoustideck absorbs sound, it dampens the high noise level rampant in exhibit areas.

Acoustideck—with a protective two-coat baked enamel primer—is part of a complete line of Inland roof systems. See Sweet's, section 2/Inl. Or write for catalog 248 to Inland Steel Products Company, 4033 W. Burnham St., Milwaukee, Wis. 53201.

Inland Steel Products

For more data, circle 41 on inquiry card
Hofstra University, Hempstead, Long Island, recently constructed a new library tower which expanded their facilities three times. To form these corner shafts, poured in place, forms were assembled in 11' x 15' x 20' gang sections, and lined with Pine, having six to twelve parcels. They owned some parcels in the worst shape. Inhibiting rehabilitation was the maximum "do not improve a building above its neighborhood." These owners say—"what's the use?"

Best prospects for rehabilitation programs, especially at the outset, are the most sophisticated of the owners, the 16 per cent who hold more than 12 parcels. By occupation most are in real estate. Most are oriented to profit through resale. They would improve now if a higher-paying rent roll could be obtained. But they are most often hit by vacancies (one owner had 18 per cent vacancies) because they own the least desirable, hard-core slums.

Urban planners have felt that vacancies would cause owners to improve their properties, but Dr. Sternlieb finds that it works the other way round. Vacancies make owners cautious and fearful of losing basic investment.

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continued from page 68

parcels. Consistently, he reports low owner concentration in his test areas. But when thinking about the high number of small owners, we still see left a large number of buildings owned by relatively few men.

Negroes own one-third of parcels sampled, and most are live-in owners. Resident-owners have better records of maintenance. The best records are held by single-parcel resident-owners who also work at a job in the area.

Resident-owners keep up their buildings, yet they are not good prospects for rehabilitation. Typically they are, or have been, tied down with high-interest, short-term mortgages. Usually they buy at inflated prices in order to get financing, since they have little or no money to put into the transaction. A parcel thus may sell to them for twice its assessment.

Resident-owners are largely ignorant of present government rehabilitation aid. In general they fear government action. They feel the pinch of recently raised municipal real estate taxes the most, and fear that improving property will bring higher tax assessment. For these reasons, as well the real unavailability of improvement money to most, they do not improve their properties. Improved properties do pay more taxes than unimproved properties, according to Dr. Sternlieb, but he also finds widespread ignorance of which improvements can be made without reassessment. Most of the latter are on the order of paint and siding.

Least interested in rehabilitating were the middle-group owners, the 8 per cent having six to twelve parcels. They owned some parcels in the worst shape. Inhibiting rehabilitation was the maxim "do not improve a building above its neighborhood." These owners say—"what's the use?"

Best prospects for rehabilitation programs, especially at the outset, are the most sophisticated of the owners, the 16 per cent who hold more than 12 parcels. By occupation most are in real estate. Most are oriented to profit through resale. They would improve now if a higher-paying rent roll could be obtained. But they are most often hit by vacancies (one owner had 18 per cent vacancies) because they own the least desirable, hard-core slums.

Urban planners have felt that vacancies would cause owners to improve their properties, but Dr. Sternlieb finds that it works the other way round. Vacancies make owners cautious and fearful of losing basic investment.

continued on page 81
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Where there are people around,

New breed

Unquestionably, you have brilliantly and precisely identified the most critical problems facing the architectural and engineering professions today in your editorial in the October issue. The problems you outline must be faced now. Your editorial formulates the challenge. Let us hope that practicing architects and engineers will meet it.

Because of the fact that you are obviously so clearly aware of what the basic problems are, I thought you might enjoy reading my article that appears in the October 1966 Consulting Engineer. I believe that the analysis of present-day engineering curricula presented therein fully substantiates Mr. Hastings' conclusions. What my article attempts to prove is that although some consulting engineers feel that they are ready to assume an increasingly greater responsibility for total building design, they were really never properly trained for it. Furthermore, those that are to follow them are not being given that type of broad training given to architects which would prepare them to accept such responsibility.

But splintered and makeshift solutions are not the answer. Perhaps a new breed of architect/engineer or engineer/architect, call him what you may, must be created. Only the cooperative effort of the most gifted minds of the leaders of the architectural and engineering professions can set the future goals of the building design professions and establish a projected and vitally new curriculum for the year 1975.

I hope that you will continue your efforts in the same vein as your editorial. Perhaps your kind of provocative and penetrating thinking will serve as a catalyst to bring into being that type of joint effort which is so direly needed. It is vital to the well being of the building industry and the professions that action be taken in this direction.

Joseph J. Pasquarelli
Technical Assistant to the
Executive Director
Board of Education of the City of New York

Anniversary grievance

There is still rankling about in my head a grievance with the Anniversary issue. And so I finally will commit it to paper in hopes of getting rid of the demon.

Quote from Emerson Goble: "... as the RECORD shifted its aim from the layman to the professional (First World War times) it gradually turned to a calmer, more professional attitude toward the inventions of architects, assuming the sophistication of the audience, and taking up what might more properly be

more letters on page 96

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continued from page 89

called reporting in depth rather than the more limited idea of ‘criticism.’”

I am unconvinced that the continuing emphasis upon form as the measure of architecture is a contemporary tool. Proclaiming a “New Age of Modern Architecture,” this anniversary issue bravely offers us “A New Meaning of Modern Architecture.” But perhaps this New Meaning is only another set of bottles in which to pickle the past.

Architects are indeed dissatisfied with the pigeon-holing structure of former art history categorizations. The words “Style,” “Beauty,” “Order,” “Classical” have all been rendered silly by our contemporary landscape. (What “Style” is a Boeing 727? Is it architecture? Has it “Beauty”? Has it got commodity? firmness? delight?).

But are RECORD’s four new bottles more helpful? Being bigger-mouthed containers, these glassy clarifications will hold more, but are such transparent distinctions useful to an architect? The study of formalistic categories may sharpen the eye, but the study of the process by which form came into being gets behind surface chatter about “mass,” “detail,” “line” to the basic responsibilities of shaping a new environment.

Let the general readership magazines popularize architecture by neatening it up. One should be tidy for company. But wouldn’t a magazine for the professional benefit from an investigation of the process by which its published “forms” are achieved?

Hugh Hardy
Hugh Hardy & Associates
New York City

The article, “A New Meaning of Modern Architecture,” was not a proposal for a new kind of parlor game, but a discussion of the definition of modern architecture which questions the historical view, still generally held, that modernism is a 20th-century phenomenon. I would be inclined to think that discussions about architectural history benefit the profession, if only because false impressions of history tend to foster false expectations of the present.

Jonathan Barnett

Another plea

We are very pleased with the October article on our firm.

I was also pleased to read the editorial, “The Practical Pressures Pushing the Profession,” and most particularly your closing plea.

I do believe that gradually the message is getting through to the profession and sincerely feel that you and your magazine deserve a great share of the credit. I hope that you will continue to challenge the profession to broaden its scope of responsibility to the point where they become qualified to truly practice comprehensive services instead of just talking about them.

R. F. Hastings
Smith, Hinchman & Grylls Associates, Inc.
Detroit

Elated team

Everyone here was very elated by the fine presentation RECORD did on our organization and work. I, in particular, was pleased because I thought the work you selected was very consistent and showed an insight and taste which I appreciated. I also thought the layout was excellent. I wish you would compliment the art director as well.

Sigmund F. Blum
Smith, Hinchman & Grylls Associates, Inc.
Detroit

Letters for this department should be addressed to The Editor, ARCHITECTURAL RECORD, 330 W. 42 St., New York, New York 10036
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The far Pacific: a new frontier for architecture

Small islands in the vastness of the Pacific Ocean are not the most likely places to examine the forces of urbanization at work. Yet in elementary form these forces are exerting their pressures on United States territory 5,000 miles and more from the west coast of this country. The process is just beginning, but its progress can be studied for insights into problems of developed as well as undeveloped areas.

In American Samoa, a group of islands in the South Pacific which have been American territory since 1899 when the Samoans ceded themselves to the United States, an accelerated program of development has been under way for the last five years. Begun as a crash program of political expediency (to clean up the islands for an international conference in Pago Pago in 1962), this program has continued under a dynamic and far-sighted governor, H. Rexford Lee, as a program to develop the education, health and economic condition of the people of Samoa. The implications of a sudden, head-on meeting between a primitive culture and the 20th century may seem more anthropological, sociological and economic than architectural, but architecture has here been playing a significant role in effecting a transition-without-tears from primitive to modern ways.

R. Wenkam

On American Samoa's five islands—Tutuila, the largest, near Aunu'u, and the Manu'a group 60 miles away—the native building form is the *fale*, oval in plan, open-sided, thatch-roofed, admirably suited to climate and custom. Villages are clusters of *fales* fronting on a *ma'ae* (open space). New buildings introduce today's technology into context of Samoan culture: precast concrete "trees" replace wood poles of *fale* for elementary school, redwood and shakes are used for roofs.
Native solutions to climatic problems are usually good responses to local conditions, and the Samoan fale (house) excellently solves the problems of building for a hot, humid climate where 200 inches of rain fall annually and mildew, rot, fungus and termites are inevitable accompaniments to heat and humidity. The thatched roof protects from rain without impeding air movements; the open sides let prevailing winds pass through: palm-leaf pula (the South Seas version of the venetian blind) can be lowered to shut out rain. There are disadvantages to this kind of construction but they are in comparison to modern convenience and sanitation rather than in essential comfort, and the advantages outweigh the disadvantages. Other than the indigenous fale, the only building types Samoans have known have been the missionary churches, a few settlers’ tin-roofed shacks, and the ubiquitous, uninspired, non-regional wood frame government building. No modern building truly designed for the tropical climate had ever been built by the U.S. government in Samoa.

The extent to which architecture has affected the assimilation of Western ways into the fa’a Samoa (Samoan way of living) is evident in the new school buildings. Early in the development program Governor Lee, recognizing the need for continuing, on-hand advice on site planning and design, appointed Ned Wiederholt, a Minnesota- and Harvard-trained architect and former faculty member at Massachusetts Institute of Technology and University of California. To get the edu-


Simple detail and careful design produced houses for $14,000 each, half usual government house cost.

Education Administration and TV studio buildings, and house above, were designed by Office of Architect-Planner. Construction is tilt-up.
cation program under way, school buildings were acutely and immediately needed. Mr. Wiederholt and two members of a Honolulu architectural firm devised a contemporary version of the fale combining its form and climatic response with modern materials to obtain a simple and economical prototype structure adaptable to a variety of conditions.

The 1962 conference in Pago Pago of the South Pacific Commission was the turning point for Samoa. Instead of the neglect and isolation it had known for 60 years, American Samoa found itself emerging from oblivion, suddenly in communication with the world beyond its shores, and in at least one field more advanced than any other country in the world. Here in this remote island, a problem that presses on three-fourths of the rest of the world is being solved with a technology beyond even the dreams of this gentle, smiling people: the provision of top-quality education with a limited teaching force at a minimum cost in teaching staff and classroom space. The solution in American Samoa is television, but not television as it has been typically used in schools. This system uses television completely, as the mainstay of the system, not as a supplement to it. With this kind of educational system, it is of no consequence that the school population is spread over 76 square miles and five widely separated islands, or that the majority of the teaching staff are native teachers with the equivalent of no more than a sixth-grade stateside education, or that there is only a handful of fully trained teachers. The teaching by TV:

Samoa’s advanced educational system

Elementary schools are clusters of up to 14 two-classroom units around a multi-use malae (open space). Units were built at very low cost of $8.50 per sq. ft. Since schools are also recreation and health centers, location is within easy walking distance from village so older people can attend adult education classes.

Lessons prepared by “master teachers” are TV-broadcast from studios and transmitted by tower on 1,800-foot-high Mt. Alava to all classrooms where native teachers are monitors.
High school at Leone, prototype of three to be built, makes economic use of space and teachers. Circular plan allows 65 square feet per student (cf. U.S. average: 110) but also permits great flexibility of space use: TV screens, heart of teaching method, can be connected anywhere on perimeter or at building center; classes can be oriented in either direction, or divided for different activities. Good acoustics permit partial partitions, hung from joists. Ventilation is by jalousied glass wall panels and eave openings.

LEONE HIGH SCHOOL, Leone, Tutuila, American Samoa. Architects: Reid and Tarics (John Lyon Reid, Dr. Alexander G. Tarics), Robert Olwell, project architect, Richard Campbell, job captain; mechanical engineer: P. T. Destin; electrical engineer: Stanley H. Anderson; acoustical consultant: Dariel Fitzroy.

potential for such a system is unlimited, making the best in education available for the first time in places where it is most needed, and offering, before an actual experience of the developed world (so much the goal of the youth of undeveloped lands), the opportunity to know it visually. The American Samoa program was set up by Dr. Vernon Bronson, educational television consultant, and "master teachers," brought from the United States, formulate the curriculum and prepare lesson material specifically tailored to the Samoa situation. Lessons are broadcast over the six-channel system which reaches the farthest villages of the offshore islands. By using native teachers in the classroom to monitor the effect of the lesson and to assist where necessary, the personal relation between teacher and pupil is maintained. The native teachers also learn in the classroom from the broadcasts by expert teachers, as well as from after-school training programs. Adult education and some entertainment programs are broadcast at night.

The islands' dream-like beauty held a natural potential for development of a tourist industry as a boost to the economy, but without an attractive hotel it could not be realized. An all-Samoan corporation, formed for the purpose, financed and built the new luxury hotel on Pago Pago Bay so that now, with the new jet airport at Tafuna, paved roads all the way around Tutula, a handsome government center at nearby Utulei Village, and the exotic scenery, tourism has a modest but promising start. The hotel's unusual blend of Polynesian forms
The hotel site across from Rainmaker Mountain is a rock promontory in Pago Pago Bay which was enlarged by 4.5 acres of fill. On the fill are two kinds of buildings—long houses and fales—providing 101 guest rooms. Public rooms (lobby, lounges, cocktail and dining rooms) are at higher elevation on rock. Hotel cost was $18,000,000. At left, above, is cocktail lounge with faletype units beyond. Below: hotel entrance. Right: above, long houses, left, and fales, right. Center: left, typical room; right, fale room.

A NEW FRONTIER
FOR ARCHITECTURE

(three two-story "long houses" and a dozen thatch-roofed fales) with the accoutrements of the modern resort hotel appeals outright to the romantic traveler, but reflects the over-all program of retaining in every possible way the unique culture of the Samoans. The "long houses," containing typical rooms, are of conventional construction, but the two-room fales bow to modern sanitary ideas: the roof structure is fire and vermin-proofed by a thin concrete membrane between the real thatch topping and the hand-tied ribs; concrete posts are used instead of native hardwood for termite and rot-proofing.

The architectural challenges of Samoa have proved to be lessons in analysis of the essentials of buildings, and this has been particularly true in the design of the new medical center now under construction. As in the other buildings, cost was important; but choice of materials and of structural system was equally important since almost all materials would have to be transported thousands of miles from the U.S. mainland, and construction would be by native workmen, skilled in their own crafts but without training in the more sophisticated methods of today's technology. The most important decisions, however, came from answers to soul-searching questions of essentiality: were any of the things in the taken-for-granted overlay of non-medical refinements, common in U.S. hospital design, really necessary in Samoa? Community ambitions, staff capacities and capabilities, patient-demanded luxury, merchandising of hospital services in a competitive situation—all aspects of hospital...
Medical center is an indigenous solution, not a mainland adaptation. Its simplicity has direct advantages for flexibility, future expansion, low cost ($29 per square foot) and use of native labor for construction. Fale-type pavilions on corridors between patient wings open to courts and are day and waiting rooms. Large outpatient department will handle all diagnostic and treatment services; 160 beds are needed for patients from offshore islands. Nursing school and residence, left, are across the road from the center.
A NEW FRONTIER
FOR ARCHITECTURE

design in the United States—simply had no relevance in Samoa, and design became, therefore, a matter of eliminating non-essentials, of plunging through the over-lay to the real requirements of a medical center. At the same time, whatever was designed had to be attractive and inviting, sophisticated enough for the future but satisfying for the present—within a framework to include modern hospital technology and a primitive culture.

The design is so suited to tropical conditions—particularly in remote corners of the world—that it is to be the prototype for a similar center to be built shortly on the island of Moen in the atoll of Truk, one of the Micronesian islands in the Trust Territory administered for the last 20 years by the United States for the United Nations. The development program already underway in the Trust Territory, hampered by inadequate funds, has as yet made little impact on these scattered islands. There is still a little time to plan for the planning processes which will bring the benefits of the 20th century to these primitive peoples and which can help them to achieve their own unique blend of technological advance and traditional cultural values. How serious and delicate a process it must be is clear when it is realized that the location of a single building can trigger irresistible urbanizing forces that will affect, for good or bad, not only the physical future of an area but the cultural, social, economic and political future of its people. Architecture, in such a circumstance, is no mere mirror of the times. Clearly and directly it has a major role in making the times.

—Elisabeth Kendall Thompson

Micronesia in transition to the 20th century

Trust Territory’s new medical center site, above, (seen from Dublon Island) is on Moen Island, Truk atoll. Center will induce rapid development due to new jobs and Polynesian custom of camping nearby during relative’s hospital stay.

The Mariana, Caroline and Marshall Islands of war fame make up U.S. Trust Territory. With same area as U.S. but only 80,000 population, it is more water than land. Controls on land use will be needed to direct growth for greatest benefit.
A HANDSOME BEGINNING FOR SOUTHERN ILLINOIS’ NEW EDWARDSVILLE CAMPUS

Amazingly faithful to its pre-construction sketches and models, the almost completed academic core of Southern Illinois University's totally new Edwardsville campus stands as a good object lesson in the handsome results obtainable when diverse buildings are planned with overall unity in mind. And its strong, basic design standards are expected to serve as the basis for unlimited growth and flexibility. The student body numbered some 4,000 last year, all of them commuters, but it is soon expected to be five times that size, multiplying the needs for specialized space and equipment. Programing of the needs for the campus, from master planning to building design to furnishings, was the result of considerable research and consultation between S.I.U. President Delwyte W. Morris and other educators, university architects Charles Pulley and John Randall, and Hellmuth, Obata and Kassabaum Inc., architects and master planners for the entire 2,600-acre campus. (See ARCHITECTURAL RECORD, August 1963, pages 109-116.)

The forward-looking success of this thoughtful programing for what may well become a major intellectual center in the Midwest, is reflected in the following statement from the office of the S.I.U. President: “New knowledge, rapidly changing technology and changing population patterns of our time called for new educational orientation, flexibility in physical plant, large growth potential, and acceptance of a high level of social responsibility. The philosophy of human operation in colleges and universities has been remarkably fixed and patterned into an organization of departments, courses and curriculum... The university rarely uses research talents on itself. It never seems to look at itself to improve. The philosophy of this institution will be one in which changes may occur. Change should be the acceptance of the day, and this campus and its structures should show our willingness to try and question the rightness of everything. We believe this initial stage of building on the Edwardsville campus represents the flexibility and convertibility required for new educational programs of the future.”

To achieve all this, Gyo Obata, HOK principal in charge of design, developed a series of general and special spaces to meet the educational program as it grows. The entire campus was organized on a functional basis rather than the traditional departmental plan. Thus, disciplines which use space in similar ways are grouped together, regardless of subject. Laboratory courses are in the science building, and disciplines which have fewer special space and equipment needs are taught in the classroom building.

Each of the buildings is also designed to provide a maximum degree of flexibility. Most of the interior spaces can be altered in character by a series of mova-
ble partitions and changeable services. However, brick towers at the perimeter of the buildings house all fixed service elements such as stairs, mechanical facilities and rest rooms. This device has permitted the formation of long, free spans to contain the active functions for which each building was designed. These spaces are expressed in precast concrete and dark glass. All of the buildings are unified by these concepts: the same, simple materials used to express an internal function. But for diversity, the materials can be combined in scores of ways to make each building an original solution to particular needs.

Vehicular circulation has been carefully planned for easy access and for views. Parking areas are divided into sections by landscaped mounds. Within the academic core, only pedestrians are allowed. It is the hope of the architects that, “The progression of spaces inside and between the buildings provides students and teachers with a sequence of places, some quiet and others busy, which makes the campus work by encouraging people to use it. In fact, the campus has established itself quickly as an equal partner with the older Southern Illinois University campus at Carbondale, 100 miles away. And the educators foresee an important future for the Edwardsville installation. Last year’s mid-size, all commuter student body will certainly grow, and a residential student and faculty community will eventually redefine the current, local focus of the campus.”

It will be extremely interesting to watch the future development and change of the campus, which will also be affected by the inevitable changes in instructional methods and in taste. If the simple, rational approach reflected in these beginnings is continued, future design on the campus should cope well with most eventualities.
The raw land

Roads and circulation

Land use
An extremely open, flexible space has been provided for the library building, to permit unrestricted use of all resource material. The open-stack book collections, places for readers, offices, and the specially designed individual carrels can be placed wherever needed. Each of its four floors has about 40,000 square feet, a limit set by librarians for efficient supervision and operation. The total building has a capacity of about 450,000 volumes and 1,400 readers. For future expansion, it has been designed so that four more floors may be added. In the basement are an auditorium and a textbook rental store.

To give vertical relief to the horizontal open spaces, the center bay has been left open with a skylight above; and at the second level, the four corner bays are two-story reading spaces.
The Communications Building is thoroughly 20th century in its comprehensiveness. It contains not only traditional facilities for the dramatic and musical arts, but all the electronic equipment and facilities needed for television and radio transmission, audio-visual preparations and data processing. The combination permits development of many common auxiliary facilities, for operating personnel and technicians, as well as performers. A number of variously sized television studios are provided, and can be used for closed-circuit instructional programs or for local transmissions. A theater for 400 people is also included; it is planned with an "open stage" which partially envelops the audience and gives a variety of acting positions.

The building is currently in the final stages of completion. But, already, an addition which will house an audience of 1,500 people is being planned. The addition will share common workshop and other facilities in the present building. The present theater lobby is enclosed by gray glass, shielded by the overhang.
CLASSROOM BUILDING

The general classroom building is a complex of two identical classroom wings, a wing with one- and two-man offices for faculty members, and a central entrance unit with main vertical circulation for the complex and lounge areas.

Each of the classroom and office wings has a 60-foot free span; this, together with use of a 5-foot module, reusable metal partitions, and modular design for mechanical services and lighting, makes it possible to create most any desired room arrangement. At present, a variety of classrooms have been set up for 12 to 200 students each. The University desired windowless classrooms to simplify audio-visual presentations. Thus, solid walls have been placed where classrooms are most likely, and glass walls around corridors to give some outward views. In the faculty office wing, all exterior walls are glass above a 3-foot mark from the floor.
All laboratories of the various scientific disciplines (such as physics, chemistry, geology and botany) are brought together in the main wing of this building. It contains 32 labs, for 24 men each, on four floors, plus a variety of preparation and lecture rooms. Attached to this wing is a unit with two lecture-demonstration rooms, each seating 240. A replica of the faculty offices unit used in the classroom building is planned as an additional wing of the Science Complex. All laboratories are completely interchangeable among the various disciplines. To permit this flexibility, a new system of laboratory furniture components was developed through an Educational Facilities Laboratories Inc. research grant. (See August 1963, page 169.) A system of individual equipment storage “tote trays” was also developed to triple the use of each lab by speeding change of equipment.
UNIVERSITY CENTER

A center for student services becomes an especially important focal point in a campus for commuters. This building has a variety of social, recreational, activities and food-service functions. Major access is provided from all four sides of the structure to a central, two-story, lounge “hub”. Off this skylighted hub on the first floor are the university store, music and reading lounges, main ballroom, and student activity offices. The second floor holds additional lounge meeting rooms and a table-service restaurant. On the lower level, which opens out onto a terrace (with views of a wooded valley to the south) are snack bar and dining facilities, as well as bowling and recreational spaces. The kitchen is a “production” one, equipped to supply food to other dining halls throughout the campus, when they are built. This building is in the final stages of construction. Works of art are being placed in major spaces of all buildings, and special graphics were designed for all campus signs.

WAREHOUSES AND DISTRIBUTION CENTERS

There is a quiet revolution taking place in the warehousing and distribution of goods—and for architects there is a new array of programming and planning considerations that imposes a sometimes surprising discipline on warehouse commissions. "Big, strong, empty space" is no longer the single objective, except in increasingly rare dead-storage situations. Although the function of storage and handling of goods implies a spaciousness as column-free as economy permits, opportunities for computerized mechanization, and changes in the role of the warehouse itself in the minds of industrial management, have generated new design conditions that require analysis before preliminary planning can proceed.

Fundamental to changes in distribution methods and facilities is the increasing realization by manufacturing management that in distribution (for which they pay about $150 billion a year) there are opportunities for huge dollar savings even with small per cent reductions in cost. So distribution has become a management function rather than a secondary routine delegated to responsible shipping clerks. Further, the scope of the distribution function has been enlarged to embrace not only warehousing and shipping but inventory control, production and sales planning, transportation and administration. This is not merely an evolution in the scale of management concern in response to cost controls. It is also a realignment of approaches to the distribution function brought about by technical and economic changes. And the effect upon architectural approaches is an increased responsibility for program and function analysis more closely related to management problems.

Two kinds of developments have affected programming and made possible the change from multiple, heavily stocked warehouses located near consumer centers and rail transport to fewer, more widely dispersed, regional distribution centers forming dynamic, controlled-inventory nodes between the production line and the consumer outlet. First are the technological developments of the computer as an order-inventory control, concurrently with sophisticated mechanized systems for handling and sorting goods. Second are newly evolved transport techniques and facilities which speed up the delivery of goods. Among transport developments are: air freight, container-ship transport (similar in concept to the trailer-ship operation at the Sea-Land terminal described on following pages), piggy-back trailer-rail services and the rapid trailer-truck services made possible by the interstate highway system.

Pacing the heart of the distribution system is the computer, keeping the whole network under such control that inventories are constantly in balance between production and consumption. This permits a sharp reduction in overall stock (with further opportunities for space reduction in computerized "random access" as opposed to compartmentalized storage of certain uniformly packaged goods) so that regional distribution centers are not necessarily much bigger than any one of the several local warehouses they are designed to replace. Richard Muther, industrial engineering and management
consultant and author of workbooks on plant layout and materials handling analysis, calls this new look in integrated production-distribution systems “vertical automation” from raw material to consumer. While noting the revolutionary roles of computerized mechanization and rapid transport in bringing about fundamental changes in general approaches to distribution, he makes the cautioning point that architects must approach each commission in this field from the specific point of view of client requirements that may or may not call for highly automated solutions. He cites the example of the two neighboring Kansas City warehouses designed by architects Kivett and Myers as described on following pages. Although both of these warehouses have similar programs insofar as transport, area served and kinds of goods are concerned, organizational requirements resulted in two entirely different solutions—one conventional, the other highly automated, both economically sound.

In general, Muther observes, every materials-handling analysis needs a classification and organization of data in four basic categories: (1) physical shapes and sizes of materials; (2) quantities; (3) timing characteristics of the operation; (4) special control characteristics involving security, records, communications, etc. It is then possible to approach the planning of the distribution center in four rational phases: (1) external integration with transportation, utilities and community; (2) over-all handling plan establishing modes of transport between gross area allocations within the complex; (3) detailed handling plan refining methods and specific systems relating one work-
The United Parcel Service Distribution Center in Chicago represents a high degree of automation in materials handling with many points of human interplay for the rapid in-and-out sorting and re-dispatch of two heavy streams of goods traffic—one a metropolitan system, the other an interstate system—with exchanges of parcels at random frequency between the systems. The interior is accordingly laid out with a conveyor assembly for incoming goods on one side and one for outgoing goods on the other. Both conveyors pass through a control center at mid-floor where a carousel arrangement with giant destination pigeon holes (bottom right) aids the hand sorting of parcels. A mezzanine and cat-walks provide access for supervision and foot traffic. Separate loading docks and marshalling areas with traffic control stations for each system are sheltered under second-floor office space or by steel sheds. The center was designed by architect Edward D. Dart, now of the firm of Loebbl, Schlossman, Bennett & Dart Inc.

Although the degree of mechanization will always vary with the warehouse program and the physical characteristics of goods handled, it is impressive to observe the ever-advancing frontiers of ultimate development. An early 1963 report in The Wall Street Journal describes "a 250-ton, computer-controlled monster" named ADMOS (automatic device for mechanized order selection) which reads punched cards at a Johnson & Johnson warehouse and automatically delivers cartons to waiting trucks at a rate of some 1,400 cases an hour, keeps track of inventory, and flashes warnings when stocks run low.

The IBM Materials Distribution Center in Poughkeepsie, New York was constructed in 1961 to replace warehouse space in a half-dozen buildings. It was designed (with the aid of a computer program simulating operational flow) to be a highly automated service for the adjacent manufacturing plant. Originally, the center had its own computerized system of record keeping which required a substantial air-conditioned area within the building. Recently this system was replaced by a plant-wide management information system called COMPASS (computer-oriented management planning and scheduling system) which links distribution records with those of purchasing and other departments through a computer located in another building. The air-conditioned space in the center was released for other purposes by substitution of a number of data transmission terminals which communicate with the plant-wide system over telephone lines.
Besides its 214,546 square feet of warehouse space, the Katz structure has 12,000 square feet of office space, most of which is air conditioned. Porcelain-enamel and glass window-wall construction was used for this area.

Compacted earth fill was used to raise the floor line of the building the required 4 feet above the natural terrain, and spread footings were placed directly on the fill. Foundations and floor slabs are concrete and exterior warehouse walls on three sides are insulated aluminum.

The storage and handling system used requires a "staging in" area for sorting incoming merchandise, storage space and a "staging-out" area for assembling outgoing orders into shipments for the individual stores.

Two warehouses for drug companies—one requiring a high degree of mechanization and the other using traditional methods of storage and materials handling—were designed by Kivett and Myers for neighboring sites in Kansas City.

The McPike Company is a wholesale firm supplying independent drugstores throughout the Kansas City area, and as such the warehouse had to be equipped for rapid, frequent and accurate selection of a very wide range of items for immediate shipment. In view of this, it was decided to install a highly mechanized conveyor system. A peripheral dragline conveyor transports goods from the receiving dock to assigned storage stations, while a system of core conveyors pulls coded

Two warehouses by one architect show how mechanization affects design
Window walls on the south and west exposure of the McPike office area are protected by roof overhang and motor-operated sun louvers. This part of the structure has a steel frame and poured gypsum roof and houses executive and general office areas, as well as a special telephone order room and a data-processing room. The entire building is air conditioned.

To give maximum accessibility to truck docks, the driveways circle the building. 119,027 square feet of warehouse and 13,900 square feet of office space.

orders through the center of the warehouse past the various stations. Items ordered are picked from the shelves and placed into tote boxes which are labeled and coded with sensitized tape. The boxes then proceed automatically to their coded position on the shipping dock.

The Katz Company, on the other hand, owns and operates a chain of drugstores which are completely supplied and serviced by the distribution center. Since the staff can anticipate and control timing, shipment and minimum size of orders, they do not require elaborate conveyor systems, but can make effective use of fork-lift trucks and conventional equipment.

The design and construction of the two warehouses reflect the difference in the systems used. The Katz warehouse is a traditional, utilitarian, steel-framed warehouse building, heated by gas-fired unit heaters and ventilated by wall-mounted exhaust fans, with conventional lines and height of storage shelves. The fully air-conditioned McPike warehouse, on the other hand, consists of 58 reinforced concrete hyperbolic paraboloids, each approximately 45 feet square, giving large areas of unobstructed floor with 16-foot height to beams.

Both buildings required protected truck dock areas and facilities for unloading railroad cars. Insulated metal was used in each case for exterior walls, with one masonry wall to be knocked down if future expansion is needed.

WAREHOUSES FOR THE KATZ AND MCPike DRUG COMPANIES, Kansas City, Missouri. Architects: Kivett and Myers; structural engineer: Robert Campbell; mechanical and electrical engineer: W. L. Cassell; industrial engineering consultants: Richard Muther and Associates.
Port facility planned as integrated complex for trailer-ship transfer

The Sea-Land shipping terminal in Elizabeth, New Jersey is a completely new, intensively planned goods transfer facility in which trailer-size containers, trucked in from inland shippers, are transferred intact to water transport for ultimate delivery, unopened, to their destination. Planning involved not only the traffic lanes and marshalling spaces for a large and growing number of trucks and trailer-containers, but integration of these huge expanses with facilities for both regular and transient personnel, warehousing and cargo terminals for assembling less-than-trailer loads into full loads, and with the considerable paper work and control points involved in such operations.

Situated on the highway side of the 92-acre compound is a
The site, which was formerly tidal marsh area, was filled by the Port of New York Authority by means of hydraulic pumps. The fill was dredged from the ocean bottom off Coney Island, barged to Elizabeth and pumped to shore until it was 20 feet higher than the proposed final level of the site. The extra sand was left to compress the lower sand for over a year, when it was removed down to grade. Wooden piles driven to underlying shale are used to support the buildings, while paved areas and utility lines are supported by compressed sand. Unity of design was achieved throughout by predominantly horizontal building forms and the consistent use of white glazed brick offset by black glass curtain and window walls in the office areas.

new home office building for Sea-Land Services Inc., which operates throughout the continental United States, Alaska and Puerto Rico. In addition to office facilities, this building contains a special computer room and a large staff dining room, which also supplies other cafeterias for teamsters and longshoremen at key locations in the compound. Across from the home office building is the long, low, general cargo building which incorporates a two-story office to serve its administrative needs. At one end of the cargo building, a depressed, dual railroad track runs inside to permit railroad cargo to be handled under cover. The interior of the building is a clear span space, 100 feet wide by 1,100 feet long. Adjustable docks for 170 trailers are provided along the sides of the building for loading and unloading less-than-trailer loads. The two-story truck operations building is flanked on either side by canopied trucking lanes which are equipped with electronic weighing scales and pneumatic-tube stations for the transmittal of documents to the offices inside. Trucks entering the compound go at once to this building, which is really the nerve center for all rolling stock, and contains a computer system on its raised first floor capable of plotting the whereabouts of every container or trailer. A fully equipped maintenance and inspection garage, wash-off facilities for trailers, a marine operations center, marine storage, and separate lounge areas, where the longshoremen can rest and relax, complete the complex.

SEA-LAND TERMINAL, Elizabeth, New Jersey. Architects: Frank Grad & Sons; structural engineers: Weiskopf and Pickworth; mechanical and electrical engineers: Cosentini Associates.
A planted courtyard provides a light well at the center of the office section, introducing natural light into most of the principal offices and permitting continuity of a virtually windowless concrete panel exterior for both office and warehouse wings. This exterior treatment facilitates maintenance of a controlled environment in both wings and unifies the exterior vocabulary throughout the building.

Interior finishes of office partitions are primarily vinyl fabric on plaster, while masonry bearing walls at the perimeter are left exposed and painted.

Liquor control center is first building in Charlotte urban renewal project

Three chief concerns guided the architects in choosing the structural system, exterior treatment and position on the site for this alcoholic beverage control warehouse and office building in Charlotte. Since the new warehouse is the initial building in a downtown urban renewal project, the owners agreed early that prime consideration be given its visual appeal. The other major goals were flexibility and ease of expansion, for the building was to house such diverse functions as general offices, communications center, interrogation headquarters, bookkeeping, warehousing and transfer space, as well as necessary facilities for servicing and maintaining vehicles.

In placing the building on its lot, care was taken for control of the various traffic patterns inherent in its operation so that they would not in any way interfere with the possibility of future expansion on the site.

Exterior walls throughout are precast concrete panels. In the office wing, panels are backed by block bearing walls, but inside the warehouse a precast concrete girder and column system bears up a double-tee roof of the same material, allowing exterior panels to provide the interior finish. The floor throughout is concrete slab on grade.

Imaginative two-story spaces dramatize low-budget house

"Overlapping sheds with skylight spaces between forms" is Clovis Heimsath's description of his design concept for this house, which was built in Houston for a sculptor and his family. A strictly limited budget and the requirement for two studios in addition to comfortable family living areas made this a challenging program for the architect. Mr. Heimsath solved the problems by adopting a shed roof motif which allowed sufficient height and volume for the creation of exciting two-story spaces and constantly changing patterns of light and shade inside and out.

Visual continuity of space between floors was very important since budget restrictions limited floor area, but a "row of little rooms" would have been functionally and esthetically unacceptable to the clients and the architect. The height was emphasized by strategically placed skylights which serve to extend the experience of space.

The first two-story space is the dramatic entry which is spanned by the hall on the second floor; the upstairs studio is a balcony above the sculpture studio on the lower level. The third two-story dimension is provided by the master bedroom which overlooks part of the living room.

The plan was developed around a central core, which consists of washer-dryer facilities and a powder room downstairs, two bathrooms above and necessary ductwork. The architect insists that this is where the scheme started. He says: "The design truly developed from plan to form. The clients had two children and might later add to the family, so the plan had to have three bedrooms, two studios, two and a half baths, living room and
family-dining room. I started with the core and from there evolved a plan which placed the kitchen and family-dining room on one side, and the living room on the other. Upstairs the master bedroom and one other bedroom are separated by the bathrooms. The hallway had to be minimum, so the entry-stair hall relationship fell in place. It was at this point that the shed roof motif seemed appropriate to give me volumetric space, and to allow skylight spaces between the forms."

Mr. Heimsath says that he had some difficulty in deciding how to relate the studio wing with the rest of the house. The massing of the other forms built up into a "counter thrusting" relationship, but the studio wing had nothing to counter thrust against. It was therefore turned around "to play off against the rest of the house. Then it worked." The resulting scheme has a rather compact, sculptural effect, but the many skylights give it life and interest and save it from being too inward-looking. At a construction cost of $24,000, it does seem quite a remarkable solution.

Mr. Heimsath is convinced that no two rooms in one house should have the same spatial impact. By placing storage on the exterior wall of the family room—in contrast to the living room where it is on the interior wall, with the fireplace on the outside—he was able to vary the interior spaces and at the same time provide sufficient exterior massing to offset the dominance of the shed forms.

RESIDENCE for Mr. and Mrs. Robert K. Fowler, Jr., Houston. Architect: Clovis Heimsath; contractor: W. A. Simmons.
A certain amount of flexibility was provided by making the ground floor studio convertible to a garage if necessary, and the upstairs studio to a fourth bedroom if required. The house is set diagonally on its site, allowing a view up a bayou on one side. From the balcony of the children’s bedroom above the garage, there is a pleasant outlook up the tree-lined street. Exterior materials of brick, rough-cedar and glass are well detailed and carefully related to each other.
ARCHITECTURAL RECORD's last Building Types Study on recreation (July 1965) argued that "the country is on the verge of what must be called a revolution in the concept of recreation, and—of more direct importance to architects and engineers—the amount of recreation facilities that must be planned and built."

That revolution now seems well underway. Item: The F. W. Dodge Construction Outlook for 1967 estimates a 6 per cent gain in this category—from $800 million to $850 million. Item: According to the Department of the Interior, we are now putting more undeveloped acres into recreational areas of all kinds than "are being swallowed up by urban development, highways, roads, airports, and similar installations. . . . During the year that began July 1, 1966 the acreage [going into recreational use] is expected to exceed 1.7 million acres." Importantly, 74 per cent of the new local, state and Federal outdoor recreation projects receiving financial help from the government are within two and a half hours' driving time of urban areas. Nearly half (49 per cent) of the projects assisted are small, with land purchases of less than $25,000. And over half of the acreage set aside is in the heavily populated Northeast and Pacific Southwest.

And if the quantity is going up, so is quality. This is a much more subjective judgment, of course—you must evaluate this with your eyes, not with government statistics. But it does seem clear that there is great excitement in the development of new ways to use specks of urban land tucked between high-rise towers or in the narrow spaces between schools and sidewalks, new concepts in the design and use of park spaces, and more building designs that effectively express their function as part of our leisure and recreational activities. On the following pages are a few examples. They are not all buildings, but they are all the work of architects—architectural solutions for an increasingly important part of our environment.

—Walter F. Wagner Jr.
Riis Plaza: design with "keen understanding of human needs"

1. The site was a flat, grassy area "impossible to maintain, and a constant source of friction. One fence led to another..."

2. Part of the area was scooped out to form an amphitheater, with a stage house, and surrounded by a peristyle that defines the area, provides shade, and supports lighting. The grades were worked out to save existing trees, and the area can become a spray pool on very hot days.

3. Just off the amphitheater is a quiet area, raised above grade with fill and surrounded by a wall that makes it work as "an outdoor room."
With a little earth moving, a little stone, a little wood, and a lot of design skill and imagination, architects Simon Breines and Ralph Pomerance, with landscape architect Paul Friedberg, transformed the useless and unused space between public housing units into “a living place” that attracts residents and neighbors of all ages all day long.

Key to the success of the project: a series of design ideas (photos and captions below) which create places for crowds and for the person who wants to be alone, for oldsters and for children, for organized entertainment or random play. There are no keep-off signs, link fences or worn grass.

The plaza has won an honor award in the first design awards program of the Department of Housing and Urban Development, and, said the jury: “... this open space development showed a keen understanding of human activities, and satisfied many human needs. It was noted that the plan permitted one to find places where one is almost alone. The details and the landscape development are excellent and of tremendous variety, but give no sense of clutter. Changes of level are skillfully handled and add a great deal to the interest and special quality of the design. The jury felt that this project showed very clearly that when large public projects do have intensive landscape development, the use and dignity of the out-of-door spaces is maximized and lends quality to developments.”

For other photos, in color, of this project, see July, pages 196 and 197.

Two new projects expand the Riis ideas

What will soon be Capper Plaza is now five acres of dirt field in the midst of several square blocks of public housing in southeast Washington, D.C.

The focus of the new plan (below) is, as at Riis Plaza, an amphitheater which can be used for dramatic and musical entertainment, for sitting, minding the children, and conversation. But—and this is a new and eminently sensible idea—around it will be not just a refreshment stand; but a laundromat, a grocery and perhaps other facilities to be operated by concessionaires.

Further, there will also be facilities...
related to the playing field—restrooms (omitted, and needed, at Riis), showers, lockers, and storage space. A recreation building will have meeting and game rooms. The open field will include spectator seating on slopes contoured into the earth, and around the main field will be small play areas for children with shaded seating for mothers. As at Riis, peristyles will be used freely to help define various spaces, and as part of the walks and promenades connecting the area with the apartment courtyards (top and bottom in plan) and a nearby schoolyard (lower left).

The Buchanan Elementary School Playground (below, this page) is another soon-to-be-constructed project for southeast Washington. It is designed as “a new kind of environment attractive both to children for play and—outside school hours—to the adult public.” Under the new scheme, the playground will have no fences, but its spaces will be defined. Much of the area will be excavated (see section) and the earth used to raise other areas and create mounds and pyramids for climbing by younger children. The lowered sections will be used for organized games, and can be used as an amphitheater. Besides mounds and pyramids, and of course slides, there will be wooden stepping blocks and plank bridges set in beds of sand. For adults there will be benches under trees and sun breaks, and, say the architects, “if these sunbreaks become favorite climbing places for children, we’ve designed them with this in mind.” Everywhere, materials used are simple, tough, and require no maintenance and no “keep off” signs.

Design that "exemplifies the idea of conservation"

The complex is set on a rolling 42-acre site which is bordered by a wildlife area. Glass, opening to decks or terraces, offers sweeping views from all rooms. Broad roof overhangs and decks control sunlight. Courtyards, landscaped with trees and shrubs, will emphasize the connection between the buildings and the land.
The Missouri Conservation Commission had a full program of direct requirements for its new headquarters building—a series of offices and specialized work spaces for the staff, several visitor reception areas, and an auditorium for use by the staff and the public. But there was also a special program requirement: the new building had to “exemplify the idea of conservation.”

To fill this special need, the architects developed a broad, open complex of six units connected by glass-enclosed corridors. The choice of materials (mostly redwood), and the use of glass walls and broad decks open to the view make the building “a visual and symbolic statement of naturalists’ goals.” Heartwarming sidelight: this building cost 20 percent less than the estimated cost of a standard “state-office-building” design under consideration before this much more appropriate building was designed.

MISSOURI CONSERVATION COMMISSION
Fountain Cafe in Central Park: new life for a landmark

The refreshment kiosks which flank the fountain respect, in shape and color, the design of the monument—yet in no sense mimic it. Nearby seating, under umbrellas that in turn reflect the shape of the kiosks, offers a fine view of the boating lake, the planting, and the passersby.
For all its earlier-era elegance, the Bethesda Fountain and Terrace—like most areas of New York's Central Park far from the reassuring lights and traffic of the perimeter streets—has generally been a lonely spot. But as part of his imaginative and astonishingly successful program to make the park safer by filling it with people, Parks Commissioner Thomas Hoving has once again made the terrace a focal point. The magnet: this outdoor cafe.

If architect James Lamantia's confection of striped canvas and kiosks is not architecture, it is an effective architectural solution to a real problem. And one can only be grateful that competition between the new additions and the century-old work of Frederick Law Olmsted, Calvert Vaux and Jacob Wrey Mould has been minimized. Example of respect for their work: when service lines were laid under the terrace, blocks were pulled one by one, marked, and replaced.

The main area (photo below) offers seated dining for 200, and a pair of kiosks flanking the fountain (photo far left) offer self-service refreshments.

A private tennis club: simple, disciplined, economical
This club—being developed by two entrepreneurs who have built several outdoor and indoor tennis facilities in recent years—is being completed in two stages. The first stage, already in use: 12 clay courts facing the first floor of a proposed two-story building. The completed section has complete locker room facilities, the pro shop, and a snack bar sheltered under a broad slatted-wood roof.

The second stage, shown in the rendering below, will add the second floor, which will include a cafe-bar, lounge, and offices, surrounded by a broad deck. Further proposed for the 26-acre site is a swimming pool, a series of four-plex units (sketch, lower right), and a few single-family houses.

The idea of building in stages is often inevitable for this type of building, where budgets are so often a problem. What is essential is—as in this case—a well-thought-out design that is at least nearly as functional and attractive incomplete as it will be when completed.

Student center for a school: contemporary for Cotswold

New building had to fit framework established by older buildings on the campus (typical example at left). Choice of material and rounded forms in stair towers and concrete tees helped create a design that is appropriate to the campus, but owes nothing to the past.
The original buildings of Avon Old Farms School were built in 1926 as "a Cotswold Village in Connecticut"—a difficult beginning for the design of this new student center. But the architect's choice of a warm brick and their use of rounded forms (for the stair towers) creates a contemporary yet harmonious solution.

The program was further complicated by the fact that the swimming pool shown already existed. The pool was temporarily covered, then spanned with precast concrete tee beams resting on masonry bearing walls. Above this is the main gym area—also with masonry bearing walls but with wood beam roof structure.

Placing the entrance at an intermediate level (see plan) lowered the "eave" of the concrete tees, a device which helps suggest the small scale of the existing campus.


Brick is carried inside the building in reception and circulation areas, but activity areas have planer finish. In the three-level plan, lockers are at intermediate level, close to both the pool below and gym above. Floor area is 25,300 square feet.
U.C.S.C. fieldhouse: bold solution to size, space problems

The field house is set into the hillside, with only the bold copper-sheathed roof extending above grade. Playing fields are to left in both photos. View above is from entry road. Minimizing the bulk of the unit in this way minimized interference with view of ocean from the road and future college buildings further up the hill.
Making a field house seem like anything less than a field house is rather like trying to make a molehill out of a mountain. But that’s just about the approach Callister, Payne & Rosse used in this field house, the first unit of the athletic center for the new campus of University of California at Santa Cruz.

This field house is located at the edge of a grassy slope facing Monterey Bay. It is built into the ridge, its mainfloor level at the foot of the slope, or playing-field level. This lower portion is reinforced concrete, with a wood floor. Out of this structure—resting on its strongly articulated pilasters capped with shaped blocks that open a narrow strip for light—rises the bold, copper-sheathed hexagonal roof. Since the elongated hexagonal plan ruled out a one-dimensional framing system, a space frame of straight tubular steel elements, with all connections welded, was selected (photo just below). Purlins are wood, the decking insulation is cement-coated wood-fiber panels.

Extending from the big general purpose room under this high roof, is locker and shower area (plan) also let into the hill. Its roof serves as a terrace and as a grandstand for the playing fields.

Future additions (site plan) will add other strongly roofed but varied structures, connected like beads on a string by added locker and service facilities dug into the slope in a curving line.

In developing this scheme, the architects followed the expressed program of the university that athletics would be primarily for recreation rather than for intercollegiate activity or as a curriculum requirement. Hence, the provisions are intended for unorganized spontaneous games and exercising, and include the large open space without the usual spec-
tator accommodations. The space does house one regulation basketball court with bleachers for 200; and the space can be converted to other small court games. Until the campus is more fully developed, the space will also serve as a 700-person capacity auditorium.

FIELD HOUSE FOR UNIVERSITY OF CALIFORNIA
AT SANTA CRUZ. Architects: Callister, Payne & Rosse—executive architect: J. Martin Rosse; project architect for the University: Bruce C. Lane, structural engineer: Stefan Medwadowski; mechanical engineer: Kasin, Cuttman & Associates; electrical engineer: Mel Cammisa; contractor: Jasper Construction Inc.
What's happened since the "Great Blackout"?

A year after the Northeast power black-out, much remains to be done to assure greater protection to life and health of building occupants. It appears that even the hospitals are moving rather slowly in re-appraising their emergency power facilities—the obvious reason being cost for equipment and segregated wiring. In New York they will not be able to postpone decisions very long inasmuch as the Department of Water Supply, Gas, and Electricity will require that all hospitals have on-site standby power by July 1968. The emergency load must include power for all treatment and diagnostic areas, power for one elevator, and enough lighting for safety. The Department's Bulletin 110, however, is much less strict than the National Fire Protection Association's Standard 76. For example, New York's Bulletin 110 does not require an outlet in each patient room to be on an emergency circuit, but only outlets in nursing units and along corridors on 50-ft centers so that 100-ft extension cords can be used to serve patients' rooms. The use of extension cords for this purpose is an unsafe practice and actually a violation of the National Electrical Code and the New York City Electrical Code.

The cost of standby on-site generators has led some hospital administrators to consider dual-use standby plants. That is, the on-site engines might be used normally to drive refrigeration compressors, but in a power outage they would be used to operate standby generators. With this approach a much larger standby power plant might be justified, able to take most of the normal electric load, avoiding duplicate wiring systems—that is, extensive segregated wiring in addition to normal wiring. The overall owning costs for such a scheme might be much less in the long run despite higher investment. This approach needs careful examination, however, since adequate reliability would require multiple units and detailed consideration of maintenance and "downtime."

A less expensive approach than dual-use was described in the article, "Planning for Reliable Electric Power," AR. February and March. It requires a somewhat larger plant than minimum, but utilizes normal wiring combined with load-dumping features to achieve coverage of desired loads, while allowing complete freedom in planning for expansion and future loads.

There is some sign of activity, however, among owners of "name" multi-story office buildings. Several had standby generators before the black-out—Union Carbide and Chase Manhattan. Now four more are reported to have installed generators in the general range of 200 kw and one of 600 kw—with several more to come.

What have the utilities themselves done? The November issue of Power reports that the various utility pools have taken steps to improve communications, including new telephone and radio links. And a number of utilities are installing standby power generation to permit safe shutdown of equipment in case of emergency and for starting this equipment up again. The article in Power suggests that in the area of consumers' power systems, new regulations are needed to assure safety and that, "Potential disasters still exist in elevators of high-rise buildings, but there are no rules for powering them in an emergency."

Structural protection against explosions

A new approach to structural design to provide structural protection against accidental explosions in the storage and manufacture of explosive materials has been developed by Amman & Whitney, consulting engineers. Originating from research performed for Picatinny Arsenal, the design approach utilizes data obtained from tests on full-scale and models-size protective cubicles.

How to make houses more wind-resistant

Techniques to strengthen both masonry and wood-frame houses against the winds of hurricanes and tornados have been recommended by the U.S. Department of Housing and Urban Development, as a result of recent FHA studies in storm-damage areas. The survey, conducted by FHA's Office of Technical Standards, disclosed that construction failures typically occurred at material joints rather than through the materials themselves.

The recommended technique for concrete block construction is to use vertical reinforcing bars at corners and wall openings, securely anchored into the bond beam at the top, extending through block cores filled with concrete and anchored securely into the footing.

ARCHITECTURAL RECORD December 1966 149
In wood frame construction, the suggested technique to tie the structure together and secure it to the foundation is as follows: Two continuous ½-in. by 1¾-in. steel straps are nailed to the tops of studs and wrapped around the perimeter. Vertical straps which hook over the plate and are terminated at the sill are tied to the foundation by anchor bolts. These vertical ties are placed at all openings and not more than 32 in. apart.

Reappraisal of engineering licensing urged

A Panel on Engineering Education organized by the Engineers Joint Council to assess a recent report on Goals of Engineering Education suggests that engineering licensing should be reviewed as a possible restrictive influence on flexibility and innovation in education. Chaired by John R. Kiely, senior vice president of Bechtel Corporation, the panel recommended that the principle of engineering licensing and the laws on which it is based should be reviewed and modifications considered by the professional and technical societies.

From the report:
- “By its established standards and minimum requirements, licensing manifests an incompatibility with experimentation and flexibility in engineering education. It tends to be a restrictive influence on this creative process by encouraging rigidity and adherence to fixed norms.
- A broad appraisal should be made of the licensing principle and the licensing laws and their control over schools, courses, and accreditation procedures. Such a review should take cognizance of the requirements of the market place in demanding certain characteristics of engineering education.

High-rise concrete frames being checked for creep

The fact that concrete creep under a compressive load is a fairly well appreciated phenomenon—being taken into account in the design of prestressed concrete for example. It follows that the concrete in columns of multi-story buildings must creep, too, and engineers would like to have more data on just how much to expect and how creep might affect some of their design details. Two of the deleterious side effects of creep that have been noted, as the columns shorten, are the crushing of exterior brick veneer walls, and the binding of sliding windows.

Just this sort of investigation is being undertaken by Professor William S. Kinne Jr. of the civil engineering department at the University of Wisconsin. Right on campus, Professor Kinne and his associates are studying creep in a 19-story, concrete-frame office and classroom building, and in Chicago, they will check a 70-story apartment building.

The U. of Wisconsin investigators have placed electric strain gages in the columns of these two buildings and will check shortening with vertical measuring devices.

Since they want to keep the normally fragile strain gages in working order over at least a two-year period, the engineers have devised a special technique for installing them. The strain gage wire is attached to a ½-in. bar 6 in. long. This strain gage is waterproofed and the bar is welded to the principal reinforcing steel of the column. Wire is strung from columns through partitions to measuring stations. A portable recording device is then carried from station to station to take strain measurements.

A new compendium of air conditioning data

A basic engineering handbook on heating, refrigeration, air conditioning and ventilation will be introduced in February by the American Society of Heating, Refrigeration and Air Conditioning Engineers. The “Handbook of Fundamentals” will supplement the continuing two-volume “Guide and Data Book” series which is being rearranged to provide a Systems and Equipment volume in 1967 and an Application volume in 1968.

Street lighting—a plea for design by professionals

The lighting of streets and public places suffers from the fact that “it is the responsibility of local authorities, with all decisions made by a lay committee advised by the engineers’ department,” in the view of John Bickerdike of Associated Architects and Consultants of London. Speaking at this year’s annual meeting of the Royal Institute of British Architects, Bickerdike stated that, “street lighting seems to be based on an incredible amount of mumbo-jumbo, which only serves to envelop a fairly simple technical problem in complete mystery.”

He said that general town lighting criteria were urgently needed, and that analysis of a town’s functions, activities and character are needed, with many of the solutions being based on a set of controlled value judgments. Further, he stated, preoccupation with cost and efficiency can spring from difficulties in defining social and spiritual needs, resulting in their existence being ignored. The developing character of a town must be allowed to guide design activities, Bickerdike continued. In lighting design we must know when to reveal by direct lighting or by silhouette, when to change brightly lit busy regions for softly lit backwaters, and to appreciate the major contribution that light buildings can make to the night scene.

Overcoming hurdles to new product application

A new department of the General Electric Company, Community Systems Development Division, thinks that one way to overcome obstacles of labor union opposition and building code restrictions in introducing new products is to build new towns. G.E. is reported to be “looking for a new city site where the local political climate will be receptive to use of performance specifications and where labor and other groups will not offer resistance.”

One possible product mentioned by G.E. is a baseboard that contains electrical wiring, water lines and air supply to reduce the cost of separate installations by plumbers, electricians and sheet metal workers.

What’s the best way to build a house floor?

How strong does a house floor need to be? How rigid? What sizes and grades of lumber framing are adequate? What advantages does pre-assembly in section or panels offer? These are some questions the U.S. Forest Products Laboratory hopes to answer by building a subfloor of five different ways in a new experimental house. The 28-by 40-ft floor is divided into five sections each 8 ft wide. Three of these sections have variations of a conventional subfloor framing covered with strip flooring and some experiments. Douglas fir or southern pine plywood of sheathing grade, preassembled drop-in panels of “T” design comprise another section, and the fifth is made up of stressed-skin plywood panels 4 ft wide by 14 ft long.

Two of the conventionally built sections consist of 2-by 10-in. joists and ¾-in. Douglas fir plywood. The joists in one section, however, consist of Douglas fir with a 1700f rating in bending. Those in the other section are of Utility grade Douglas fir, which is not stress rated. The stress-rated joists are spaced 24-in. apart and the Utility-grade joists, 16-in. In the third section, 1750f rated southern pine and 1700f Douglas fir joists are 2 by 8 in. and are spaced 16 in. on center.

Finish floors will include conventional strip flooring and some experimental types in block and strip form, nailed or cemented to the subfloor.
Glazing recommendations for tinted glass

Tinted glass absorbs more solar energy than clear glass. Because of partial shading, particularly of the glazing rabbet on sunny elevations, the center of a light of glass gets hotter than the shaded edges. Since the center expands more than the cold edges, tension stresses result at or near the edges. Structural reliability requires that the edges and surfaces immediately adjacent be free from deep scratches, vents, nips and crushes near the center of jambs or sill. Below are photographs of acceptable, borderline and unacceptable edges.

Tinted clean cut edges

- Ideal
- Convolutions
- Shark teeth

Tinted borderline edges

- Shark teeth
- Serration hackle
- Flake chip
- Serration hackle

Tinted unacceptable edges

- Deep shark teeth
- Deep serration hackle
- Serration hackle with spalls
- Impact damage

Tinted glass is generally used for three reasons: to reduce flow of solar heat into a building; to cut down sky glare and to enhance the appearance of the building. By its nature, tinted glass is a solar-heat absorbing glass, and greater care must be taken in the design and specification of this type of glazing, than with clear glass. The reason is simple: tinted glass exposed to sun is subjected to higher temperature stresses than clear glass, and thermal breakage can result if these stresses are excessive, or if the edges of the tinted glass are not cleanly cut and thermal stresses are high.

To encourage improved practices in the design, specification and installation of tinted glass, Pittsburgh Plate Glass Company recently developed a technical guide which sets out: (1) design and details for good performance, (2) cutting and glazing recommendations, and (3) reference information on estimating thermal stresses and glass edge strength required. This article summarizes the approach and major recommendations.

Stresses induced in glass by wind are different than those due to solar load: solar load stresses are greatest at or near the edge, while wind load stresses are greatest on the surface. It is essential, therefore, when tinted glass is to be used on sunny elevations that the glass edges be cleanly cut; that the fenestration design minimize the effect of solar load as much as possible; and that the glazing detail be designed to protect glass edges and allow glass installation without damage to edges.

The greatest temperature difference expected on a plate glazed in a building would be about 60°F or 3,000 psi edge tension stress. The temperature difference and edge stress is low with low heat capacity curtain wall construction but greatest with massive masonry mountings which resist change in glass edge temperature. Indoors, tightly closed drapes or blinds act as a heat trap, increasing glass temperature and edge stress. Partial shading from adjoining buildings, an offset or canopy in the construction of the building or mounting with glass set back from face of building increases edge stress at the shade line.

The ability of tinted glass to resist solar energy breakage is determined by edge strength. In-service edge strength depends primarily upon the size, thickness, type of cut, and edge treatment. Tinted clean-cut edges are the strongest presently attainable in annealed glass. Seaming, grinding, or polishing weaken a tinted clean-cut edge. The strength consistently attainable in a tinted clean-cut edge depends largely upon the skill and care of the glazier or glass cutter, and upon his tools and working condi-
TINTED GLASS

Custom factory fabrication was required for the ½-in.-thick, pattern-cut tinted lights for this department store.

For lights of regular shape (rectangular or square) and less than 200 sq in. in area, tinted clean-cut edges will suffice.

Because of the thermal lag of concrete, tinted glass set in concrete frames may require factory cutting to assure strength.

Tinted clean-cut edges on lights with edge area up to 200 square inches can be expected to carry thermal stresses of 3,000 psi. Heat strengthening increases edge strength by at least 2,000 psi.

Making straight clean cuts in large thick plates is difficult. Proper tools, cutting tables and skillful mechanics are essential. Cutting plates to a circular pattern is more difficult.

Normal practice followed with clear (non-tinted) glass is adequate for tinted glass on near-north elevations. Tinted clean-cut edges are essential on all sunny elevations. Tinted clean-cut edges must be called for in the specifications, and in the order, for openings where they are required. Custom factory fabrication (which may include heat strengthening or other processing) will be necessary where job conditions are likely to create edge tension stresses greater than the strength attainable in tinted clean-cut edges.

Heat strengthened glass is approximately 2.5 times more resistant to wind loads than an equal thickness of ordinary glass. One-quarter-inch heat strengthened glass will carry about the same wind load as ½-inch regular plate glass and may be more economical, too. Where uniform fenestration appearance is a design objective, it is desirable to glaze the entire building with one glass thickness (appearance varies with thickness).

Heat strengthened glass of the same thickness can be used in larger openings and to resist higher wind loads to be expected at upper floor levels.

The architect can control several factors which determine the magnitude of solar stresses.

1. Orientation of windows: Windows facing north are exposed to little direct sunlight. Windows facing between N 60 W and N 45 E require normal glazing practice. All others must be glazed according to recommended tinted glazing practice.

2. Size and shape are important factors in evaluating the possibility of solar breakage. Large lights, usually thicker to withstand design wind loads, absorb more solar energy and may be exposed to greater edge stress.

Strong edges are necessary; they become difficult to obtain as edge area increases. Specify "custom factory fabrication" when edge area is greater than 200 square inches.

3. Indoor shading: Indoor shading reflects heat out through glass; thus the central area becomes hotter. Air between indoor shading and glass acts as an insulator, reducing the heat glass can dispose of, thus increasing central area temperature. The following indoor shading devices are listed in order of increasing glass stress:
LEST: effects of solar heat on tinted glass can be compounded if the heat that gets through is trapped by interior shading and if the air grilles are located between the glass and the shading. If the space between glass and shading is not ventilated, the trapped air forms an insulating layer which makes this air get even hotter, increasing the temperature of the glass. Natural ventilation can be provided by leaving a minimum of 1 in., but preferably 6 in. between the glass and the shading, a minimum of 1 in. at the sill and 2 in. at the head. The lighter in color, and the tighter the weave, of draperies, the more the heat reflected back toward the glass, and thus the higher the air temperature; closed venetian blinds trap even more.

ABOVE: partial shading of glass due to building framing, louvers, balconies, etc. increase tension stress on glass edges. Plain horizontal, vertical and diagonal shading are less severe than double diagonal shading. The worst condition is a double diagonal shade line with a 70 degree included angle.
Examples of glass lights that require custom fabrication. Bent glass must always be obtained from the factory. Pattern-cut lights with holes or notches also must be factory fabricated. Curved and slanted-cut lights must be factory fabricated when over ¼-in. thick.

Favorable framing. Edge stresses are minimized when the framing has low heat capacity, such as with zipper gaskets. When sun strikes the window, both the glass and gasket become warm.

Normal framing. Lightweight metal mullions and rabbets also allow the edges to gain or lose heat fairly closely to that of the center of the glass, again minimizing edge stresses to solar heat.

Unfavorable framing. When tinted glass is rabbeted inside a massive concrete frame, the thermal lag of the concrete will cause large temperature differentials between centers of lights and the edges. Edges can be damaged when glass must be set in pocketed flush framing, since the glass needs to be joggled into place.

a. No shade
b. Dark open-weave draperies
c. Light open-weave draperies
d. Dark closed-weave draperies
e. Light closed-weave draperies
f. Dark venetian blinds
g. Light venetian blinds

4. Air space between glass and indoor shading: Where indoor shading is used, ventilating the air space will help to reduce edge stresses. Natural ventilation can be provided by leaving at least an inch between draperies and surrounding construction at sill, two inches at head. As glass-shade spacing is decreased, edge stress increases.

5. Heating grille location: Heating grilles should be located on the room side of draperies; never between draperies and glass. Grille vanes should direct warm air away from glass.

6. Double window units: Double window units with air space or integral shading, and windows in combination with storm windows, are more susceptible to solar breakage because of the insulation air space. Use heat-strengthened glass in double-glazed units with shading in the air space.

7. Laminates: Laminated glass has twice the perimeter of cut-edge, and it is difficult to obtain tinted clean-cut edges in laminated glass. Therefore, it is desirable to use heat strengthened glass in tinted laminates.

8. Outdoor shading: Tension stress on glass edges increases appreciably with partial outdoor shading. Balconies, awnings, framing members, louvers, trees and shrubbery, may introduce shading stress. Horizontal shading, diagonal shading, and vertical shading are less severe than double diagonal shading. The most severe shading is a double diagonal shade line with a 70 degree included angle between shade lines, intersecting at the middle of one edge.


10. Framing system: Framing of low heat capacity tends to minimize edge stress. Structural zipper gaskets make excellent glazing rabbets because they are black and insulating. Metal glazing rabbets and frames are used frequently and successfully.

Massive concrete frames in thermal contact with glazing rabbets have great heat capacity and cause high edge stresses. Concrete becomes cold at night and does not warm up as fast as glass when the sun shines. Zipper gaskets or insulating sash tend to reduce stresses.

11. Pattern cut lights: All pattern-cut lights with holes or notches require custom factory fabrication. All pattern cut lights over ¼-in. thick require custom factory fabrication.
Total energy for five apartment groups

A combination of factors, including a centralized maintenance program, favored the use of on-site power generation and heat recovery in five apartment complexes in the Kansas City area. Natural gas engine/generator sets supply the electrical power and heat is recovered from engine jackets and exhausts.

The first apartment development was the 90-unit Mission Valley completed in 1964, and now a 246-unit project is in operation. Two other projects, one 385 units and the other 121 units (to be enlarged to 270) are partially completed, and a third of 334 units is under construction.

Apartment buildings represent a good application for total energy systems since the electrical load profile is fairly even throughout the day, except for small morning peaks and larger peaks at dinner-time. The electrical peaks obviously will be higher when cooking is done by electricity—which is the case with the first three projects. The fourth has gas ranges and domestic hot water heating is by gas hot water heaters in each apartment, rather than from the central system. All projects were engineered by Truog and Nichols, mechanical engineers and contractors.

Equipment payoff

The economic advantage of these installations is based on the fact that lower utility costs will amortize the additional cost of equipment, and give utility savings after equipment payoff. In the Mission Valley apartments it is estimated that equipment costs will be paid off in 10 years through fuel savings, based on utility savings of $14,500 annually. Costs of the 246-unit Kenilworth project equipment are expected to be amortized in six years, based on energy savings of $40,000 yearly. Additional costs of total energy equipment above that for central air conditioning is estimated by Truog and Nichols to be $500 to $600 per apartment.

Truog and Nichols have made total energy more attractive to owners by offering a regular maintenance service and emergency service. They have signed contracts for these services with owners of all of the projects, making prorated cost per installation much lower than possible for a single installation.

Moreover, to eliminate the need for permanent maintenance staff at each site, Truog and Nichols have installed a central monitoring system in their offices. Warning lights and sound signals give the alert when selected operating parameters are not within prescribed limits. Presently, two installations are completely monitored. The other two are tied only to the alarm system, but eventually they will also be completely monitored. Only two specialized maintenance men are needed—an engine mechanic and an air conditioning serviceman.

Kenilworth Apartments

Kenilworth development, designed by architects Boyle and Wilson, comprises 19 buildings surrounding a clubhouse. There are a total of 246 dwellings, ranging from one to three bedrooms; net rentable area is 264,467 sq ft, with an additional 19,727 sq ft in halls. The basements under the apartment buildings total 147,137 sq ft. Equipment is in the 4,940-sq-ft basement of the clubhouse.

The total energy installation includes two 450-kw natural gas engine/generator sets and two 225-kw sets, providing 60-cycle, 3-phase power at 480 volts.

At least one set is in constant operation, with the remaining sets on standby. Maximum demand load has been estimated at 750 kw. A control system parallels the engines and generators and automatically operates the installation according to pre-reset schedules.

Heat recovery is by a vapor-phase system connected to each engine and producing about 6 pounds of 12 psi steam per kw generated. At an average power generation rate of 650 kwh, yearly. Additional costs of total energy recovery system delivers about 3,900 lbs of steam per hour.

Additional steam is available from two natural gas low-pressure boilers, each rated at 9,680,000 Btu/hr input and a maximum production rate of 8,000 lbs of 12 psi steam per hour. In the fall and the spring, when the heat recovery system produces more steam than needed, the steam is rejected to the atmosphere through an excess-steam condenser.

Cooling is provided by two absorption machines—one of 275-ton rated capacity, the other 250-ton, for a total of 525 tons.

Individual apartments are served by a two-pipe system. Chilled water is supplied at 45F and returned at 55F. Hot water for heating—via a converter—is supplied at variable temperatures, ranging from 90F to 106F, with a temperature drop in the return line of about 20F. Hot water temperature is governed by outdoor reset control.

Change-over from the heating to the cooling cycle can be achieved automatically in about 30 minutes, from cooling...
Gas engine/generator sets for Kenilworth apartments (three of four shown) satisfy a maximum demand load of 750 kw. There are two 450-kw units and two 225-kw units.

Equipment room for Kenilworth is in the 4,940-sq-ft basement of a clubhouse. In addition to engine/generators, space is required for steam separators, absorption refrigeration, units, boilers, converters.

Main switchboard and generator control board for Kenilworth. Engine/generators are automatically paralleled.

Monitor board at Kenilworth includes a scanner (center of board), gages for monitoring the four engine/generator sets, recorders to show engine heat recovery and steam consumption for heating and cooling, and temperature indicators for outdoor air temperature and heating and cooling water.

Main distribution panel, with pull-out type switches serving various sections of the 246-unit apartment project at Kenilworth.
to heating in about 15 minutes. An outdoor thermostat sensing device actuates the cooling cycle when the temperature reaches 72°F, and the heating cycle when the outdoor temperature drops to 65°F. Design temperatures in the area are -10°F in winter and 100°F and 78°F wb in summer outdoors, and 76°F db and 64°F wb indoors.

Each apartment is equipped with an air-handling unit installed in the basement. Most units are rated at 800 cfm; there are some 1,200 and 1,600 cfm units in the larger apartments. Air supply to the first floor is through ducts and outlets on the floor level at the perimeter, with returns high on the inside walls. For structural reasons, air supply on the second floor is from internal walls, with returns via the perimeter.

An interesting feature is the fact that the cooling towers, for esthetic reasons, are installed in the engine room; 200,000 cfm of air circulates through filters to the towers, with intake at ground level in front of the clubhouse, and exhaust through a slot in the roof, which runs the full length of the building.

An additional 30,000 cfm of outside air is circulated over the engines and an evaporative cooler, which supplies the carburetor intake of the engines with air at a temperature of 80°F to 90°F. Exhaust is through the cooling tower.

Because of the strong negative air pressure in the engine room, boilers are screened off behind a glass partition so as not to affect the burner operation. There is an air supply to the boiler room, with a balance exhaust.

Total electric load of the equipment room at peak operation is about 200 kw, including 50 kw for the cooling tower blowers. The clubhouse load is 45 kw.

All critical pumps and controls are in duplicate to prevent a breakdown, including pneumatic controls, compressors, boiler feed pumps, circulating pumps, and an excess steam condenser pump.

**Georgetown Apartments**

This Kansas City development has total energy and air conditioning system that is designed along the same lines as that at the Kenilworth Apartments. The 225 dwelling units currently completed have an average size of 950 sq ft. One hundred and sixty new apartments are being added. Architects were Linscott, Kiery & Haylett.

In the engine room below the clubhouse are two 450-kw natural gas engine/generator sets and one 225-kw set. A fourth set—also of 450-kw generating capacity—will be installed when the development is enlarged to 385 units.

There currently are two absorption machines—125 tons and 250 tons; another 250-ton unit will be installed later. About six pounds of steam are recovered per kw generated through the vapor phase system.

There are two natural gas boilers: one with a rated input of 6,925,000 Btu/hr input and a production of 6,086 lbs of low pressure steam. A third boiler will be installed later. Cooling towers are installed outdoors behind a brick wall wall adjacent to the clubhouse.

The two-pipe system, air-handling units in the apartments, pneumatic controls, and other equipment are all comparable to that in the Kenilworth apartments.

Both clubhouses—for the Kenilworth and the Georgetown clubs—have 20-ton compressor-type air-conditioning systems for operation when the clubhouses need cooling while the central systems are on the heating cycle.

**King's Cove**

Eventually there will be 270 apartments in the King's Cove development, designed by architects Elswood, Smith & Carlson.

There are presently two 250-kw gas engine/generator sets, 480 volts, 60-cycle, with a third set planned for the future. There is one 188-ton absorption machine, and another machine will be added later.

The vapor-phase heat-recovery system produces about 4 to 5 lbs of 12 psi steam per kw generated. Additional steam is produced by a natural gas boiler, rated at 5,538,000 Btu/hr input and producing a maximum of 4,554 lbs of 15 psi steam. A second boiler is planned to produce 3,693 pounds of steam per hour.

There is a two-pipe system, with air-handling units in closets in the apartment, rather than in basement. Air supply is via the perimeter on the first floor and from high wall outlets in the second floor, with central return in both cases.

Total electric load at King's Cove is considerably lower than at Kenilworth and Georgetown—about 1.2 kw per apartment. There are several reasons for this: the apartments are smaller, an average about 860 sq ft; ranges are gas rather than electric; outside lighting is by gas rather than electric, and each apartment has a gas hot water boiler instead of being supplied with hot water from the central system.

ARCHITECTURAL RECORD December 1966 157
A consulting engineer's lighting laboratory

As lighting design has grown more complex in terms of both its esthetic and functional aspects, the need has arisen for better ways to predict end results. The response of New York consulting engineers Syska & Hennessy is the establishment of their own lighting laboratory as an aid to their designers and specifications writers, and to their clients.

Perhaps the most demonstrable value of the laboratory so far is its use to build mock-ups of spaces in buildings under design. (One example is shown in the top photo.) Here Syska & Hennessy and their architectural clients can check room appearance, lighting levels and certain details of lighting fixture design such as ceiling recesses, flanges, etc.

The laboratory has a total of 1,750 sq ft of space of which one-third is office and conference area, and the remaining two-thirds is work area for mock-ups and storage for samples of lighting fixtures and accessories.

The working area can accommodate up to six mock-ups simultaneously, and the 12-ft ceiling permits architectural conditions to be duplicated. The ceiling has a grid of lightweight steel channels for suspending fixtures and ceiling materials and for erecting walls. The grid has electrified tracks for plugging in fixtures.

Short of constructing mock-ups to approximate fairly closely the appearances of spaces as to scale, color, ceiling arrangement, etc., sections of ceilings, or just the fixtures themselves can be hung from the ceiling grid to aid the architect's visualization of lighting fixture operation, performance, lighting effect achieved and installed appearance.

The conference area has a suspended luminous ceiling with a large variety of diffusing devices installed to demonstrate how various lighting equipment compares in regard to reflected glare, visual comfort, architectural appearance and efficiency. The ceiling is varied by: (1) exchanging louvers, lenses and diffusers; (2) varying the selection of fluorescent lamps; and (3) raising and lowering the ceiling.

In addition to designing and building mock-ups, the laboratory staff, under the supervision of Jules Horton, develops special lighting equipment; designs lighting systems for architectural projects; checks calculations; checks specifications and shop drawings; maintains a collection of lighting equipment for demonstration purposes and a file of technical literature and slides.
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Roof of underground garage for Village Towers apartments by I. M. Pei & Partners was waterproofed entirely by butyl rubber membrane. Sheets were not adhered to the slab, but were made into a continuous membrane by using overlapping seams. 1. Rolling top sheet back onto adhesive layer of bottom sheet. 2. Seam is coated with adhesive and joint completed by covering with butyl tape. 3. Prefabricated rubber flashing was used at inside and outside corners. 4. The membrane was terminated at building walls with the main sheet serving as flashing. Sheet is held in reglet with steel wool; opening is caulked with butyl.

Leak-free roof for underground garage

By K. A. Gruber, Carlisle Tire & Rubber Division, Carlisle Corporation

New materials and techniques are now being used to waterproof the roofs of such underground facilities as parking garages. The traditional built-up membrane system is being used less because tremendous areas are often involved and thermal expansion and contraction have potentially damaging effects. A case in point of the new approach is the garage directly under a 56,000-sq-ft park and plaza area for Village Towers apartments designed by I. M. Pei & Partners. The waterproofing system had to assure effective long-term performance under lawns, trees, sidewalks and cobblestone paving. The butyl membrane was specified on the basis of: (1) its ability to follow structural movements and expand and shrink without damage; (2) its tear and abrasion resistance, which allows it to withstand the construction traffic and operations before the membrane had been protected with an inch layer of concrete; (3) its immunity to damage by soil and agricultural chemicals, bacteria and aging; (4) and, of course, its excellent water impermeability. Tight specifications were written for splicing adjacent sheets of membrane, termination of the membrane at all points, flashing and corner details, and inspection and testing procedures.

The waterproofing contractor Wolfow-Braker Roofing Corporation, Brooklyn, estimated that the single-ply membrane installation required half as many man-hours as a conventional built-up roofing system. Rolls of the butyl rubber sheeting were factory-cut to predetermined dimensions to minimize waste. The membrane, 1/16 in. thick, was supplied in widths from 6 to 20 ft, and in lengths up to 94 ft. The installation was planned so that the widest membrane would be used wherever possible to minimize the amount of splicing.
The main waterproofing membrane serves as flashing for pipe penetrations such as the one in the photos, right: S. First, a hole is cut in the membrane and adhesive is applied to the underside around the hole. The pipe is coated with adhesive and butyl tape. 6. The membrane is folded back over the pipe and pulled up around it. 7. The membrane is rolled to assure good adhesion. 8. Finally, the membrane flashing is coated with adhesive and butyl tape is wrapped around it. After the membrane waterproofing was completed, it was checked by damming test areas with felt and lumber to hold 3 in. of water.

The membrane was applied to the reinforced concrete deck without a bond. At all vertical surfaces, however, a special adhesive was required to assure contact between membrane and wall. Wherever possible, the membrane was terminated at the building walls with the main sheet serving as flashing. The sheet was first bonded to the wall, then terminated in a reglet, where it was fastened with lead wool. The exposed portion of the reglet was then filled with butyl rubber caulking.

Where use of the main sheet was impossible for flashing walls, this was done by splicing sections of membrane to the over-all sheet, then the flashing was terminated at the reglets. It was also necessary to line the interior and exterior of a sump in the central planting area to prevent the escape of water to the underlying slab. This sump collects water from the drainage field and serves as a sand trap. The entire area above the waterproofing membrane is drained through porous concrete pipe that delivers the water to the sand trap.

The membrane was placed in position simply by unrolling it onto the deck for its entire length and width. Adjacent sheets were then formed into a continuous membrane by a standard splicing procedure that has demonstrated high seam strength.

All joints were made through lap splicing. Adjacent sheets were first overlapped 3 in. The top sheet was folded back approximately 1 ft and the contacting surfaces of both the top and bottom sheets were coated with a special butyl cement. A strip of gum tape was then applied over the cement on the top sheet. The top sheet was folded back to form the overlap, and finally the exposed edge was covered with another layer of cement and butyl gum tape to complete the splice.

Installation of the membrane at corners, both inside and outside, was facilitated through the use of factory-fabricated corner pieces. Use of these pre-shaped sections is of particular importance where there are a great number of intersecting planes caused by different elevations.

Because of the general layout of the rubber sheet, the membrane was rolled longitudinally over the exposed beams. The membrane was then cut along the length of each beam and the sheet brought up along its sides. Adhesive was applied to the top and vertical surfaces of each beam to hold the membrane in place. Application of flashing, applied to the top of the beam and then spliced to the main membrane, provided positive covering of the exposed section of the beam.
MEZZANINE SHELVING / These double-deck shelving units can be stacked for extra storage space without increasing floor space. Vertical splice connectors attach mid sections of the shelves to support catwalk flooring. Access to the elevated storage level is by especially designed stairways. • Bernard Franklin Company, Philadelphia.

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OFFICE AREAS / Quik-Lok shelving forms office working areas according to individual needs. The line includes standard and sloping shelving space, desk-size working surface, and storage areas with sliding doors. No bolting to walls or floors is required and walls can be easily adjusted to different shapes or moved to other areas. • Aurora Steel Products Division, Hupp Corporation, Aurora, Ill.

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STUDY CARREL / This low-priced ($65 in volume) sturdy institutional unit is constructed of solid core modular units interlocked within an aluminum framework • Uniline, Grand Rapids, Mich.

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PANELS / Architectural and decorator panels in several textures and colors, for outdoor and indoor applications can be mounted, drilled, or cut to desired shapes. Uses include area dividers, pool enclosures, cabinet doors, windows, suspended ceilings, skylights, and shoji screens. • Leigh Products, Inc., Coopersville, Mich.

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FOLDING DOORS / Accordion folding doors and partitions with a tested acoustical rating of STC 38 and STC 25 have panels of laminated plastic. Five wood grains and three laminate patterns are available. Hinges connecting the panels are flame-resistant, extruded vinyl which, the maker says, can handle 950,000 flex cycles without wear or deterioration. • Panelfold Doors, Inc., Hialeah, Fla.

Circle 305 on inquiry card

more products on page 176
FIRE PROTECTION STANDARDS / Three publications have been revised: "Standard for Fire Doors and Windows" (84 pages, $1.00); "Standard for the Installation of Sprinkler Systems" (188 pages, $1.00); and "Standard for the Installation of Air Conditioning and Ventilating Systems of Other Than Residence Type" (32 pages, $.60). National Fire Protection Association, 60 Batterymarch Street, Boston.

STANDARD MOULDING / A standard book for the softwood industry, entitled "WP Series Moulding Patterns," has been published by the Western Wood Products Association and the Southern Pine Association in cooperation with the Western Wood Moulding Producers. Western Wood Moulding Producers, Portland, Ore.

ARCHITECTURAL POTTERY / A 53-page catalog and accompanying price list present sand urns, lanterns, umbrella holders, space dividers, sculpture, and fountains. Architectural Pottery, Los Angeles.

PATTERNED CONCRETE MASONRY / A 16-page booklet suggests many intricate shapes and designs possible with concrete screen block. The booklet pictures typical installations and discusses the properties of the block. National Concrete Masonry Association, Arlington, Va.

DECORATIVE PANELS / Literature on Decra-Guard high density overlay decorative panels includes color illustrations of several woodgrain patterns available bonded to a variety of substrate materials, sizes and thicknesses. A file folder contains complete information on combinations of patterns, finishes and grades. There are performance data and test comparison tables. Send requests on letterhead. Simpson Timber Company, 2000 Washington Building, Seattle, Wash. 98101

HARDWOOD SCREENS / A 4-page color leaflet describes Sculpturewood screens for home, office and commercial applications. The leaflet shows the choice of patterns available in walnut, birch or poplar and notes that the screens, framed and finish-sanded, may be custom-finished. Penberthy Lumber Company, Los Angeles.

STONE SCULPTURAL FACINGS / Two 4-page brochures on the complete Stone Sculptural Facings Collection and lightweight Nova-Stone wall-surfacing material include the recently introduced patterns by Perli Pelzig and Erwin Hauer, the Bjorn Wiiblad Sun Wall Sculpture, and the Yucatan and Taniko Collections. The brochures contain photographs of actual exterior and interior installations along with complete information on the stone. Arts for Architecture, Inc., Garden City Park, New York.

STEEL DOOR AND FRAME / A 32-page illustrated catalog details steel door and frame lines. The catalog also includes a steel-frame selector guide, a frame anchoring system, and sections on hardware adaptability, transoms, and side lights. Amweld Building Products, Niles, Ohio.

FOOD PREPARATION AND SERVING / A catalog lists over one hundred models of stainless steel and galvanized scullery sinks, and stainless steel dish and utility carts, plus a newly designed line of plastic laminate. Amtexco Industries, Inc., Columbus, Ohio.

PARTITION SYSTEMS / A 40-page manual covers different kinds of non-load bearing plaster partition systems and various types of metal lath/accessories. Illustrations include photographs and detailed engineering drawings. There are fire resistance ratings and sound insulating data. Wheeling Corrugating Company, Wheeling, W. Va.*

LAMINATED WOOD BEAMS / "Your Dollar's Worth of School Building" is a 16-page color brochure that shows typical classrooms, libraries, gymnasiums, cafeterias, auditoriums, and dining rooms built with laminated wood beams. Information on the complete line of beams and trusses and data on decking systems are also included. Portland, Oregon.

LAMINATED MEMBERS / An 8-page illustrated booklet on standards for structural glued laminated members of Douglas fir and larch covers standards being followed by Western laminators. Tables cover strength levels most commonly used. Western Wood Products Association, Portland, Ore.

INDUSTRIAL INSULATIONS / A 20-page brochure gives technical and application data on fiberglass industrial insulations. The brochure includes information about thermal and acoustical blanket insulations, insulation board, pipe insulation, and specialized fiberglass products. Gustin-Bacon Manufacturing Company, Kansas City, Mo.*

GLAZE SYSTEMS / A 24-page catalog contains a simplified index for specifying specialized coating systems for interior or exterior walls, floors, and ceilings. Color photos showing finished applications are keyed to an index that describes the product and its uses. Cota Industries, Des Moines, Iowa.*

DIRECTORIES AND LETTERS / In addition to a variety of building directories and letters, a 52-page booklet contains a miscellany of useful items: bulletins, trophy cases, crosses, tablets, plaques, emblems, flagpoles and art metals. Nelson-Harkins Industries, Chicago.

*Additional product information in Sweet's Architectural File

For more information circle selected item numbers on Reader Service Inquiry Card, pages 255-256.
Crawford Marvel-Lucent Fiber-glass Doors glide smoothly aloft on high-lift tracks to clear the cranes which operate in each service bay. The large, (224 sq. ft.) Marvel-Lucent door areas provide excellent light for working by transmitting up to 60% of outside daylight and diffusing it well back, into the service bays.

EXCELLENT NATURAL LIGHT A BONUS IN THIS MODEL SERVICE CENTER WITH CRAWFORD MARVEL-LUCENT DOORS

Taking advantage of the translucent character of Crawford Marvel-Lucent Fiber-glass Doors and the ability of this new white fiber-glass to transmit up to 60% of outside daylight, Michigan Tractor and Machinery Company has captured an important bonus in the form of excellent natural light in the work bays of the model Service Center in its new plant at Novi, Michigan.

The building which houses the Service Center is laid out in the form of the letter H with the “quick” Service Center forming the middle section or cross-bar of the H and connecting the front wing with the rear wing. This cross-bar is 150-ft. long, 125-ft. wide and 21-ft. 6-in. high. It covers six bays, each with its own pair of overhead cranes operating from the ends and giving great flexibility in handling the heavy bulky components in big, earth-moving units.

The bays run from south to north and at each end of each bay, a Crawford Marvel-Lucent door gives access and light. In each bank four doors are 16-ft. wide by 14-ft. high and two, for smaller equipment, are 14-ft. wide by 14-ft. high. All are operated by chain hoists, the doors being so light (one-quarter the weight of wood, for example) that no electric operators are needed.

Daylight transmitted by these doors reaches away back into the bays and not only supplements the light from ceiling fixtures above the craneways but creates a pleasant, exceptionally well-lighted working area which could hardly be achieved in any other way.

The front wing of the building is equipped with three large Crawford Wood Industrial Doors. All are operated by Crawford Model CJ Jackshaft Type Electric Operators with control by push-button inside the doors and in two remote locations.

In the rear wing there are seven more large Crawford Wood Industrial Doors—operated by Crawford Model CJ Jackshaft Type Electric Operators.

Crawford Marvel-Lucent Doors are made with a new formulation of fiber-glass resin which is unaffected by ultra-violet rays and which develops a finish so hard that it is practically unaffected by chemical factors, and by wind-driven rain and grit, traditional enemies of fiber-glass. Because of this new development in resins, this door is warranted for 20 years and is the only fiber-glass door so warranted.

For information on this and other notable features of this new door, write for Bulletin C D-3681.

CRAWFORD DOOR CO. Subsidiary of JIM WALTER CORPORATION 4270-30 High Street • Ecorse, Mich. 48229

For more data, circle 66 on inquiry card
Want the most from electric heat? Consider Styrofoam.

That's because an installation system using Styrofoam® brand insulation board doesn't make demands on floor space the way other insulations do. The combination of properties offered by Styrofoam makes it unusually effective. So much so that you get more permanent insulation value per square inch, and get a maximum of usable floor space, too.

How else is Styrofoam good for electric heat? Once in, Styrofoam is in for good because it doesn't rot, mold, or deteriorate. It needs no vapor barrier. It's flame retardant. And is lightweight and easy to install. Where does Styrofoam insulation go? Just about anywhere. Over walls of unit masonry or poured concrete, as form liners for conventional concrete, in foundations and slabs. And it makes an excellent base for gypsum wallboard, wood paneling or plaster.

Have we almost made a sale? Then to clinch it, write us or consult Sweet's Architectural File 10a/Do. The Dow Chemical Company, Plastics Sales Department, Midland, Michigan 48640.

Styrofoam is Dow's registered trademark for expanded polystyrene produced by an exclusive manufacturing process. Accept no substitutes... look for this trademark on all Styrofoam brand insulation board.

(It's the least you can do.)

For more data, circle 67 on inquiry card

For more data, circle 68 on inquiry card
Holophane’s Round PAL—a recessed incandescent luminaire that’s crisply styled where you see it...

**Versatility.** Adjustable collar permits choice of 150, 200 or 300 watt incandescent lamps for use in downlighting, area lighting or highlighting.

**Soft, uniform illumination.** Prismatic Contro lens and high-efficiency reflector combine to deliver glare-free, low-brightness illumination.

**Rapid and safe relamping.** Positive Automatic Latching (PAL) allows relamping from the floor. Simply push lens to open, push trim to close.

**No light leakage or warping.** Hood, trim and door are die-cast to exacting tolerances for perfect, permanent alignment.

**Clean, unobtrusive styling.** Regressed Contro lens and narrow trim blend smoothly into ceiling. No latches or hinges disrupt clean look.

superbly engineered where you don’t.

**Holophane’s new Round PAL.** Specify Round PAL® for stores, banks, lobbies, restaurants, auditoriums, terminals and supermarkets. Write for a comprehensive brochure which includes electrical, mechanical and photometric data. Dept. H-12, Holophane, Company Inc., 1120 Ave. of the Americas, New York, N.Y. 10036

*Round PAL by Holophane*
Concrete Reflects
An Educational Concept

George Williams College is devoted to training leaders for youth groups, community agencies and humanitarian organizations throughout the world. This concept places emphasis on active student participation in many creative areas.

Imaginative design, with a free-form concrete motif, reflects the creativity of the activities to be housed in the Leisure and Creative Arts Center, featured here. This beautiful new structure has combined facilities for gymnastics, swimming and other sports as well as for painting, sculpture, photography and dance.

Here, as in many new trend-setting designs, the fine quality, ready mixed concrete was made with Lehigh Cement. Lehigh Portland Cement Company, Allentown, Pa.

The Leisure and Creative Arts Center is the architectural highlight of the 14 buildings on the all-new campus of George Williams College. Great curving corner ribs, tied together underground with concrete encased post-tensioned tendons of steel, carry the two intersecting concrete barrel vaults for the gymnasium roof. Studios for painting, sculpture, photography and dance are beneath the gymnasium. Post-tensioned concrete ribs, 117' long, support the concrete vaults over the natatorium. Both gymnasium and natatorium have unobstructed floor areas of 112' x 112' under the 4" thick concrete roofs.

Owner: George Williams College, Downers Grove, Ill.
Architects: Mittelbusher & Tourtelot, Chicago, Ill.
Wilson Connell, Jr., Partner-in-charge
Structural Engineer: John R. Gullaksen, Chicago, Ill.
Consultant: Dr. William Schnobrich, Urbana, Ill.
General Contractor: Turner Construction Company, Chicago, Ill.
Ready Mixed Concrete: E. A. Keller Co., La Grange, Ill.

LEHIGH CEMENTS
This could change your thinking from the ground up!

Ozite® Town 'N' Terrace Carpet made with Vectra® fiber proved attractive and durable on walkways, balconies, patios, porches, in kitchens, hospitals, offices, restaurants... with over 10 million yards in use! Where would you use it?

Use your imagination! Ozite Town 'N' Terrace Carpet has passed the test of time, with over 3 years of use in thousands of installations across the country. Snow, rain and hail won't hurt it. Resists mildew and fading. Won't rot...ever. Amazing Vectra fiber resists staining from food and drink...like mustard, ketchup, tea and coffee. Even household chemicals like bleach, ammonia and peroxide wipe clean quickly.

Use Ozite Town 'N' Terrace Carpet in kitchens and restaurants to add comfort, reduce noise, cut dish breakage. Put it in recreation rooms and bathrooms to give warmth, end floor scrubbing and waxing. Use it in new dramatic ways outdoors...on patios, walkways, balconies. Starting to get ideas? Read about the technical advantages of Town 'N' Terrace on the back, then mail coupon for full details.

As advertised in LIFE magazine
Available in 16 decorator colors
Ozite® TOWN 'N' TERRACE CARPET made with Vectra® OLEFIN FIBER

* Ozite is the exclusive trademark of the Ozite Corporation.
† Vectra is the registered trademark of the Vectra Company, a division of National Plastic Products Company, Inc., for its olefin fiber. Vectra makes fiber only, not carpets.
Tests prove the superiority of Ozite Town 'N' Terrace Carpet made with Vectra® fiber over floor covering costing twice as much!

3,000 revolutions of abrasion test have $11.95 retail acrylic carpet down to the backing!

But, the abrasion wheel (Standard Taber Abraser), which can quickly spin off years of hard wear, barely makes a dent in new Ozite Town 'N' Terrace Carpet made with remarkable new Vectra polypropylene olefin fiber. Ozite's unique manufacturing method permits the use of staple fiber of higher tensile strength than normally used in regular carpeting.

Fadeometer Test

<table>
<thead>
<tr>
<th>Fiber</th>
<th>Without Stabilizers</th>
<th>With Stabilizers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wool</td>
<td>100 hours</td>
<td></td>
</tr>
<tr>
<td>Acrylic</td>
<td>160 hours</td>
<td></td>
</tr>
<tr>
<td>Nylon</td>
<td>100 hours</td>
<td></td>
</tr>
<tr>
<td>Polypropylene</td>
<td>216 hours</td>
<td>Over 2,000 hours</td>
</tr>
</tbody>
</table>

Most manufacturers of piece-dyed carpets try for 40 to 60 hours fade resistance. Even stock-dyed carpets strain to reach 200 hours. The special stabilizing chemicals used in the solution-dyed Vectra fiber enables it to resist ultra-violet rays — and permits Ozite to guarantee its carpet to withstand 500 hours of Fadeometer test without discoloration!

Stain Resistance

<table>
<thead>
<tr>
<th>Fiber</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wool</td>
</tr>
<tr>
<td>Polypropylene</td>
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</tbody>
</table>

Vectra polypropylene fiber is resistant to most harmful chemicals that tend to bleach and stain competitive products, including most acids, alkalies, salts, solvents, and oxidizing agents. Ozite Town 'N' Terrace Carpet resists spotting and bleaching from ammonia, chlorine, coffee, tea, soft drinks, shoe polish, merthiolate, mustard, catsup — practically everything, including the accidents of dogs and children. Insects and mildew do not attack polypropylene. Fungus growth is not supported by the fiber itself, won't shrink, rot, or mildew. And it's virtually non-static. Non-allergenic, too.

Competitive carpet fibers absorb moisture to varying degrees, up to 27%.

A filament of Vectra reacts to water much like a solid glass rod. The water rolls right off. Vectra olefin fiber has zero (0%) moisture regain.

Easy to install. Cuts with scissors or knife. Lies flat. Doesn't curl. No binding of exposed edges necessary. Does not need carpet cushion, tacking, or professional installation. However, if desired, it may be installed the same as conventional carpet. It is recommended that in most instances Ozite carpet be installed without permanent or semi-permanent adherence. Where it is desirable to adhere the carpet, the following methods of installation are recommended. Double faced tape or Ozite AP 400 waterproof adhesive may be used both indoors and outdoors.

And it's a breeze to maintain! Can actually be hosed clean. Simple to patch. Because Vectra fiber is impervious to moisture it can either be scrubbed clean or vacuumed. It dries fast. And patching for cigarette burns (can happen to any carpet, you know) is easily done in minutes with a razor blade and leftover pieces — and it won't show!

Installation and maintenance manual available on request.

Every claim guaranteed by the Ozite Corporation.

Write today for full information.

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Department AR
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Chicago, Illinois 60654

Please send me your 4-page color brochure with complete details on new Ozite "Town 'N' Terrace" Carpet, plus sample swatches of the carpet.

Name_____________________
Firm_____________________
Address___________________
City_______________________
State_____________________ Zipcode_________
It's tough to find a better primer than the one we use for Sheffield Steel Joists

Any other primer you specify would cost you more, too. The red oxide primer applied on Sheffield Steel Joists was especially formulated to meet Federal Specification TT-P-636c. Considering both economy and efficiency, this time-proved red oxide primer is the best that can be provided. Then too, it is non-bleeding, which simplifies the application of a finish coat of paint.

This red oxide primer provides protection, at no additional cost, when you specify a shop coat of paint on Sheffield Steel Joists.

Demonstrating the value of this primer, a test was performed by an independent testing laboratory, with salt spray (under Federal Test Method Std. 141). After 200 hours exposure to a 20% salt spray the sample showed "no apparent change." This was one of four tests used to show the dependability of this paint.

All Sheffield Shortspan and Longspan Steel Joists, made to the widely-accepted specifications of the Steel Joist Institute, are supplied with this durable and economical red oxide primer. Write us for our newest catalog. Armco Steel Corporation, Department W-7326, 7000 Roberts Street, Kansas City, Missouri 64125.

ARMCO STEEL

For more data, circle 71 on inquiry card
Solve two major design problems with flexible fluid roofing

**Problem 1:** Cover multifaceted roofs without design compromise. Example: vari-pitched roof of church shown here.

**Answer:** Specify fluid roofing of Du Pont Neoprene and HYPALON® synthetic rubber.

**Problem 2:** Cover long span, pre-cast concrete, subject to considerable contraction-expansion. Example: folded plate roof of pier complex shown here.

**Answer:** Specify fluid roofing of Du Pont Neoprene and HYPALON.

Fluid roofing is easily applied to these shapes... and to almost any curved hard surface. It cures quickly to form a tough, continuous weathertight membrane. HYPALON offers colorful surfaces that resist ozone, sunlight, heat, cold, industrial fumes and abrasion. Both Neoprene and HYPALON are flame resistant. This system gives years of watertight performance.

Du Pont makes both Neoprene and HYPALON, not roofing. Write for a list of fluid roof coating suppliers and literature on fluid roofing.

Du Pont Company, Room 4786
Wilmington, Delaware 19898

Du Pont Neoprene
HYPALON

Better Things for Better Living
... through Chemistry
NEV from the inventors of cellular steel floor

ROBERTSON Q-LOCK FLOOR

New Q-Lock Floor possesses all the virtues of Robertson Q-Floor while adding some new ones of its own. When concrete is poured over Q-Lock Floor, the scientifically-designed indentations and embossments rolled into the steel structural elements develop composite action. Therefore, this new design locks together the structural properties of both materials in a tight grip and results in a more efficient and economical use of both materials. Use the coupon or write to Robertson on your letterhead for literature.

RECENT Q-LOCK INSTALLATIONS


This is a highly economical deck where long spans are not necessary. Can be used with studs weldable through deck as a part of composite frame construction with further economies (often a reduction of 1 pound/sq. ft. in framing of structure of building).

With the welded bottom plate this style provides electrical raceways.

This wide structural unit (used in pairs) also functions as a secondary duct for air conditioning.

For more data, circle 73 on inquiry card
REFRESHMENT IN CONCRETE

Here's a lifetime of refreshment indoors or out... and you can tailor it to suit your specs! It's precast reinforced concrete as Haws pedestal Model 30, or as Model 50-C, a wall-mounted fountain. Order either in exposed aggregate or light sandblast finish... and in a wide color choice, too! In the pedestal version, Haws gives you three column heights (30", 36" and 42"). A freeze-proof valve system is also available in both models for cold-climate outdoor installations. When you specify modern refreshment, specify a Haws fountain of stone... exactly to your specs. For further information, write the HAWS DRINKING FAUCET COMPANY, 1441 Fourth Street, Berkeley, California 94710.

Wall-mounted Model 50-C also comes in polished aggregate, in color of your choice.

For more data, circle 74 on inquiry card
Specifications and Load Tables for High Strength Open Web and Longspan Steel Joists

It's the Steel Joist Institute's practical working handbook of everything you need to specify joists to carry uniform loads on spans up to 96 feet.

The 1967 Edition covers the following joists: J-SERIES, joists made from 36,000 PSI minimum yield strength steel; LJ-SERIES, longspan joists compatible with the J-SERIES; H-SERIES high-strength joists with chord sections made from 50,000 PSI minimum yield strength steel; LH-SERIES high-strength joists with chord and web sections designed on the basis of 36,000 PSI to 50,000 PSI yield strength steel. Send coupon for your free copy of this valuable handbook.

MAIL COUPON TODAY!

STEEL JOIST INSTITUTE
DuPont Circle Bldg., Washington, D. C. 20036

Please send me a complimentary copy of the 1967 Edition of Specifications and Load Tables.

NAME
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CITY
STATE
ZIP

For more data, circle 75 on inquiry card
New kind of glass keeps out noise: ACOUSTA-PANE®

When interior plans require offices near production lines, you can now provide full visibility plus effective sound control. Just specify ACOUSTA-PANE, the only true acoustical glass. Available in ratings high as STC 43, ACOUSTA-PANE reduces noise levels at all significant frequencies. It outperforms plate glass, and many “blind” materials, too. Yet ACOUSTA-PANE is a single glazing unit, installed as easily as plate glass in standard partition sections. (You can also use ACOUSTA-PANE for exteriors to shut out noise without cutting off the view.)

ACOUSTA-PANE is produced clear and tinted—bronze or grey. Extra bonus: ACOUSTA-PANE is laminated safety glass and shatter-resistant. Find complete information in A.I.A. File No. 26-A-9, Sweets Architectural File. Or write to us.

amerada
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Elk Grove Village, Illinois 60007

Amerada Glass Corporation is exclusive licensor of Bolt, Beranek & Newman, Inc. for the manufacture of multilayer sound-retarding glass. For more data, circle 76 on inquiry card.
G-E Silicone Traffic Topping permanently hides unsightly surfaces, permanently protects new ones.

**Waterproof.** Traffic Topping prevents water penetration and moisture retention damage in concrete and other flooring construction materials. Protects against freeze-thaw cycles. Repairs previous damage. Ideal for outdoor ramps, platforms, walks, and traffic bearing roofs.

**Permanently flexible.** Made of silicone rubber, Traffic Topping keeps its resilience indefinitely. Won't harden, soften or become brittle, even at −65°F or 300°F. Provides a cushioned walking surface as it protects.

**Wear resistant.** Traffic Topping withstands wear and abrasion of shoes and vehicles. It's a superior surfacing medium for parking areas, garages, promenade decks, and light duty industrial floorings.

**Quick, easy application.** Traffic Topping adheres securely to most clean flooring construction materials, old or new. Needs no costly equipment. Cures to a tough, weatherproof surface. Looks great too. Six colors available.

**Skidproof, too.** Even when wet, Traffic Topping's textured surface assures safe, sure traction where it's needed most: pool copings, laundry rooms, public walking areas, tennis courts. And it even makes non-skid stair treads.

**Fights chemicals.** Because Traffic Topping resists many chemicals, organic acids, alkalis, salts and oils, it is an ideal surfacing medium for food processing and similar plants, where such materials present a problem.

For complete information and your distributor's name, write Section BG12248, Silicone Products Dept., General Electric Company, Waterford, N.Y. 12188

**For more data, circle 77 on inquiry card**
Occupational therapy for hospital designers
(or maybe it's motels, hotels, nursing homes...)

Take the Troy® cure for laundry planning headaches. Simply tell us how much space you have, and how many beds. The Troy Laundry Planning service will take it from there—analyze equipment needs, plan your entire laundry, and prepare equipment specifications. We'll take care you get the best use of space for the least cost (and prove, incidentally, that you can save more per bed, per day with a Troy on-premise laundry.)

We also guarantee your clients complete supervision of installation, system follow-up, and lifetime mechanical service of the equipment.

For fast relief from laundry planning headaches, write or call your local Troy representative today.

TROY LAUNDRY MACHINERY
A DIVISION OF AMETEK, INC.
EAST MOLINE, ILLINOIS

For more data, circle 78 on inquiry card
It's also crack, chip, peel, stain and fade resistant...because the surface panels are

VIDENE by

GOODYEAR

Modern's new Videne surfaced wall systems offer you beauty and color styling unlimited: 34 colors, 6 patterns and 16 wood grains all architecturally coordinated. Videne surfaces are exceptionally tough and durable. They cost little more than wet finishes, last infinitely longer. Finishes are low-gloss, easy to clean, unaffected by temperature changes, and are highly moisture resistant.

For style, beauty, quality and economy, Modern wall systems, surfaced with Videne paneling by Goodyear, are in a class by themselves. If you'd like to know more about them, just write us. We'll be happy to assist you in developing a custom-designed movable wall system for any project you may have in mind.

The Videne wood-grain panels have realistic texture and figure...the natural beauty and feel of fine woods.

Here's some essential information about Modern movable walls with Videne surfaces.

Modern offers you four movable wall systems, to provide for the widest variety of styling, special requirement and budget situations.

Colors and designs—40 in all—have been styled to meet the most rigorous standards for architecturally oriented interiors. Special colors can be developed for larger projects.

Color stability. All colors are non-fading; color vibrance and intensity are assured for many years.

Wood-grain finished panels have a non-repetitive uniformity of pattern and grain that blend together without painstaking matching.

Wearing qualities. The Videne panel surfaces are tough and mar-resistant for long life, lasting beauty—up to three times as abrasion resistant as high-pressure laminates. Videne surfaces are dimensionally stable.

Maintenance is minimal. Smooth, low-gloss surfaces are easy to clean—shed dust and dirt. Highly resistant to stains. Surface abrasions and scratches can be removed, original luster restored, with ordinary cleansers.

Installation is quick, simple, low-cost. Panels are easy to saw, rout, joint, drill or shape with conventional tools. Extra-large, built-in raceways reduce wiring costs.

Maximum flexibility. Completely modular, non-progressive wall systems allow removal of any section without disturbing wiring or adjacent panels.

Several sound cores available—STC ratings from 30 to 43.

Matching Videne panel system for fixed walls. Complete with all moldings, match Modern movable partitions.

Matching doors, Videne surfaced, in a wide choice of styles.

Custom treatments. A choice of trim, and other special effects enable you to achieve individualized interiors.

Quality control of Modern movable walls is continuous throughout production. Extremely high standards of materials and workmanship eliminate costly on-site labor, assure life-long satisfaction.
It loves traffic! Any kind of traffic—fork lift trucks, concrete mixers, dump trucks, tractor trailers...the heavier the better. The 'trussed' reticuline bars, their depth and their large areas of air-tight contact with the bearing bars, provide the ultimate in bearing bar bracing, stability, and load distribution. So it can take ANYTHING. Our representative can bring "in use" proof.

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For more data, circle 89 on inquiry card

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**PERSPECTIVE MAPS** / Flat plans and photos may be converted into graphic three-dimensional maps. The angle— similar to an aerial view—shows streets and roads in scale, receding in the distance with buildings and natural features in relief. The Perspecto Map is available in any size, choice of colors, flat or folded and arranged to include copy. Perspecto Map Co., Chicago.

Circle 312 on inquiry card

**ELECTRIC ERASING MACHINE** / A compact model weighs only 18 ounces. The Deletor comes in two models: one contains a built-in mercury switch that starts the motor automatically whenever the eraser is tilted slightly downward; the other has a push button switch. W. L. Engineering Company, Clifton Heights, Pa.

Circle 313 on inquiry card

**RULER-MECHANICAL PENCIL** / The Comparule replaces five tools—compass, protractor, rule, pencil and stylus—with two that are easy to carry in a pocket. The instrument draws circles with a diameter up to 10 in., measures or constructs any angle, and measures lengths to six in. Price is $1. The Comparule Co., 242 W. Portage Trail Ext., Cuyahoga Falls, Ohio.

more products on page 205
Posttensioned, precast segments form 133-ft. girder

The segmental posttensioning techniques used are simple, fast, and economical. Although the erection sequence varies depending upon the number of tendons used, the fundamental steps are as follows:

- Precast column shell sections are placed and filled with lightweight concrete.
- Temporary shoring truss is secured in position.
- Precast girder segments are placed and aligned, sealing the periphery of the joint with gummed, foamed plastic tape.
- Rubber pneumatic tubes are threaded into mating prestressing ducts and inflated to 5 psi.
- With tape sealing periphery of joint and tubes sealing duct holes, the 1-in. space between segments is filled with high-early-strength grout. (3,000 psi in 24 hrs.)
- Tubes are deflated and withdrawn. Tendons are inserted, each consisting of twelve \( \frac{3}{8} \)-in., 270 ksi strands.
- Tendons are stressed and anchored (Freyssinet Method) as columns above girder are placed.
- Ducts are pressure grouted to protect tendons.

Columns combine precast, cast-in-place techniques

Each column is composed of a precast shell into which fresh concrete is placed. This provides uniform color and texture . . . and precludes the necessity for the decorative concrete mix throughout the entire column. Columns taper from a width of 6 ft. 9 in. at the third floor to 4 ft. at the penthouse, and are typically 5 ft. 6 in. deep. Mix design data for the column concrete fill are:

- Portland cement, Type I: 800 lbs.
- Fine aggregate (sand): 1245 lbs.
- Coarse aggregate (lightweight expanded shale): 735 lbs.
- Water: 43.8 gals.
- Water/cement ratio: 5.2 gal. per bag
- Entrained air: 4 percent
- Slump: 4.25 in.
- Strength at 28 days: 5000 psi

Turn page for more information

For more data, circle 92 on inquiry card
Construction of core walls

Core walls of Gulf Tower progressed simultaneously with the exterior precast concrete framework. Consequently, it was possible for the prestressed concrete double-tee floor slabs to be positioned directly atop the core wall. Wall forms were of 3/4-in. plywood on 2x6-in. horizontal studs, backed up by double 2x8 vertical walers. Heavy-duty, 9,000-lb. ties held forms against concrete pressures. The structural core as designed resists all wind forces acting on the building.

Precast, prestressed concrete double-tee floor slabs span 40 ft.

Metal brackets welded to inserts in the spandrel beams support one end of the 18-in.-deep double-tees. The opposite end rests in pockets cast in the core wall or on precast concrete planks which are part of a composite girder extending from the column to the core wall. Tees are placed in north-south, east-west directions on alternate floors to equalize load distribution on the columns. A 4 1/2-in. lightweight concrete topping is placed over the double-tees providing flexibility in accommodating electrical raceways. Air conditioning units located under the window area have individual temperature controls for office space.

Exposed white concrete sculpture ascends high above Jacksonville skyline

White cement and white quartz sand combine to create a bold sculpture which dramatically defines the individual "work areas" of the office building. Tinted glare-reducing glass contrasts sharply with the white concrete frame. The frame segments were cast in Tedlar-coated steel molds resulting in dimensional accuracy and uniformity of color and texture. The precast concrete exterior surface is permanent and will require little or no maintenance.

FREE helpful literature
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<td>Please send me literature relating to the techniques used in construction of the Gulf Life Tower (U.S. and Canada only).</td>
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An organization of cement manufacturers to improve and extend the uses of portland cement and concrete

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PORTABLE HUMIDIFIER / This unit features automatic shut-off and a light that glows when the tank is empty. The unit is in a wood-grained cabinet with rolling casters that make it easy to move about.  
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WATER COOLER / A semi-recessed unit extends only 9 1/2 in. from the wall. The cabinet is constructed of heavy-gauge steel with vinyl-laminate finish of Chestnut Tweed. It is also available in stainless steel or walnut vinyl-on-steel.  
* Ebco Manufacturing Company, Columbus, Ohio.  
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SLIDING DOORS / A versatile patio door, available in four multi-slides and five pocket configurations offers 45 variations. Security lock and all wool pile vinyl barrier weather stripping are standard.  
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* Molded Plywood Division, Plycraft, Inc., Lawrence, Mass.  
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FASTENING SYSTEM / A concealed system has been designed to prevent vandalism and pilferage of bathroom accessories. There are no visible signs of attachment.  
* G. M. Ketcham Manufacturing Company, Glendale, N.Y.  
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The new Century Plaza Hotel in Los Angeles is 20 stories high and is located in earthquake Zone 3. In what is believed to be a first, the designers combined the ductility of the steel rigid frame and the stiffness of X-bracing to make this structure earthquake-resistant. The unique structural system permitted a story height of
Only 8' 10" with a floor to ceiling height of 8' 51/2", with no beams projecting into the rooms or corridors. This integration of structural and architectural space meant low unit cost and very low unit weight per square foot of floor area.

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Mr. Carroll F. Brent
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Jame Mr. Brent:

This is in reply to your inquiry concerning the butyl membrane waterproofing for the three-level basement of the Humble Building in Houston, Texas.

The entire foundation and subsurface portion of the Humble Building was excavated to a fifteen-inch-thick-thick bed of the building was poured and was covered with a one-eighth-inch-thick sheet of butyl spread on a thin concrete slab at the bottom of an excavation about sixty feet deep. The edges of the sheet were extended up along the inside of the foundation and the concrete basement wall to form a waterproofing layer around the subsurface portion of the building. Approximately 130,000 square feet of the one-eighth-inch-thick membrane was required for the installation of the basement. The butyl membrane was installed in one-eighth-inch-thick rolls. The owner, Mr. Brent, states that the butyl membrane was installed during the spring and summer of 1960. It is still in excellent condition with no evidence of deterioration and has provided the owner with a dry, leak-free basement. The water table at the building site is approximately thirty-five feet above the bottom of the membrane waterproofing so that the lower thirty-five feet of the building and butyl membrane are normally completely surrounded by water.

The butyl membrane was installed during the spring and summer of 1960. It is still in excellent condition with no evidence of deterioration and has provided the Owner with a dry, leak-free basement. The water table at the building site is approximately thirty-five feet above the bottom of the membrane waterproofing so that the lower thirty-five feet of the building and butyl membrane are normally completely surrounded by water.

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LIGHTING / Surface-mounted fixtures that look like floating luminous clouds come in several sizes and shapes to fit large or small areas. The soft translucent white diffusers have matte outer surfaces for more effective diffusion and lower surface brightness. • Peerless Electric Co., San Francisco.

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PAGING LIGHT SYSTEM / A system that has been developed for industrial and office buildings offers fast, quiet communication between telephone switchboard and operating personnel anywhere in the building or on the grounds. Numbers are assigned to personnel who, when paged by a chime, look at a double-faced panel. The ceiling- or wall-mounted panel, visible up to 100 ft, shows the lighted number. • Wrightco Corporation, Chicago.

Circle 320 on inquiry card

STREET LIGHTING / This residential luminaire has tough refractor panels made with polycarbonate resin. The panels protect fixture and mercury lamp against vandalism and make possible a low (10 to 14 ft) mounting height. • General Electric, Pittsfield, Mass.

Circle 321 on inquiry card

LUMINAIREs / A group of wall-, ceiling- or pendant-mounted fixtures for both outdoor and indoor use incorporates 5 in. spheres in modern geometric forms. The units may contain from one to nine lamps and combine painted or metallic housing with either cherry or American walnut vinyl film panels. • Omega Lighting, Inc., New York, N.Y.

Circle 322 on inquiry card

more products on page 214
SANDVIK MOVATORS... gives a unique solution to easier shopping and parking.

At this new store in San Francisco, Skaggs Pay Less Drug Stores' customers will glide with stepless ease from rooftop parking to the floors below and then up again with loaded shopping carts. They'll be riding on SANDVIK MOVATORS... moving walks of rubber-covered steel.

SANDVIK MOVATORS provide an exclusive combination of advantages... a heavy-gauge, one-piece endless belt of solid spring steel gives rigidity and no-stretching... grooved rubber covering assures safe, non-slip surface... SANDVIK wide-rib, narrow-groove tread and special landing plate design prevents heel-catching more positively than any other design. The MOVATOR installation for Pay Less is just one of many made by Sandvik in ten years of design, manufacturing, installation and service experience. Sandvik can apply this background to your requirements anywhere in the U.S.A. today. Write for SANDVIK MOVATOR booklet or contact your nearest Sandvik office.

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TERNE METAL: The Accessories

We believe most architects are now aware of terne’s nearly unique design potential for visually significant roofs in the contemporary idiom. But terne is also among the best of accessory metals — probably the best when initial cost is balanced against durability. If considerably fewer architects are aware of it in this context, the fault is largely our own, for we frankly haven’t found too many exciting things to say about gutters, flashings, valleys and gravel stops. Exciting or not, however, these commonplace items still play an important role in most buildings, and any failure can be very troublesome indeed. When next specifying them, therefore, why not give Follansbee Terne a trial? It should not only save your client money, but under normal exposure has a life-expectancy measured in generations rather than years.

Combination Gravel Stop and Fascia

Valley

Gutter and Downspout

Chimney Flashing

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**PRODUCT REPORTS**

continued from page 210

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**Fully Transistorized.** Everyone in the family will enjoy the comfort, convenience, and peace of mind this system provides. From any room in the house you can . . .
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**ACOUSTICAL CEILING TILE** / “Sculptured classic” patterns of mineral-fiber acoustical-ceiling tile may be used for ceiling accents in conjunction with other mineral-fiber tiles having the same surface texture. The patterns may also be used for an entire ceiling in executive offices and reception areas. Tiles have noise reduction coefficients of 65; K factor of 0.35; and a flame spread of 10 to 15. The Celotex Corporation, Tampa, Fla.

**BUILDING MATERIAL** / A new material, BMX, made from soil and a petroleum-based binder, may be used in place of conventional masonry products such as concrete blocks and fired clay bricks. The manufacturer reports that tests in brick and block form and in varying shapes and sizes showed “engineering properties associated with premium masonry products.” The product has smooth surfaces and close dimensional tolerances. **Addex Manufacturing Co., Wickliffe, Ohio.**

**ROOF SYSTEM** / A cold process, glass-reinforced, neoprene/Hypalon system, under the trade name of Flex-A-Dek, is described as “the most advanced, elastomeric seamless roof system available.” It may be used for any slope, any contour, in any color. **Addex Manufacturing Co., Wickliffe, Ohio.**

**BELOW-GRADE WATER STOPPAG**E / Corrugated kraft panels filled with bentonite provide permanent water control for below-grade construction. Volclay Panels are slightly overlapped when applied to below-grade vertical walls with staples or mastic, and then backfilled. Upon contact with water, the bentonite swells to a gel that is 10 times its dry volume, leaving a vertical wall of bentonite that expands into foundation cracks as they appear. **American Colloid Company, Skokie, Ill.**

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Talk-A-Phone Co., 5013 N. Kedzie Ave., Chicago, Illinois 60625

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For more products on page 218

214 ARCHITECTURAL RECORD December 1966
This is K-44. The first 4' x 4' prismatic. A sky-size island of light. Beautiful. Like a BIG ONE should be. Sculptured in sparkling clear prisms that give you lighting as it should be. Don't compromise on white opal pans or louvers or two-piece enclosures. Go big with the BIG ONE. Specify K-44. You'll turn on 16 square feet of exciting lighting.
The case for PuOLITE® paint resins is based on Federal Specifications TT-P-97b, TT-P-91b, TT-P-95a, TT-P-115c, TT-P-110b, TT-P-28c, TT-F-001098 and TT-P-618a.

These specifications put the official stamp of approval on synthetic binder resins like PuOLITE...

For use in masonry paints (TT-P-97b). For concrete floor enamel (TT-P-91b). For swimming pool finishes (TT-P-95a). For traffic-marking paint (TT-P-115c) and paint used to obliterate traffic markings (TT-P-110b). For paint designed to withstand temperatures to 1200°F (TT-P-28c). For a filler for porous surfaces—cinder block, concrete, stucco—(TT-F-001098). And in a fast-drying zinc chromate primer for exposed metal surfaces (TT-P-618a).

Tough, chemically inert PuOLITE resins have proven their durability in paint for over 15 years, in all parts of the country. And in the toughest tests described in Federal Specifications. For more information on PuOLITE resins, and names and addresses of paint manufacturers who use PuOLITE... send the coupon.

GOOD YEAR CHEMICALS

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PLAZA TOWERS
—the pride of New Orleans—

Locks up with Lockwood

The tallest peak on the New Orleans skyline is the brand new Plaza Towers. Beautifully designed, this office building sets the pace in modern architecture at the new Civic Center.

Above eight floors of underground parking, rise 29 floors of offices, topped by a heliport.

Lockwood is indeed proud to have Lockwood Hardware play such an important part in Plaza Towers—the pride of New Orleans.
MORE IMPORTANT — what will the DUWE SYSTEM do for you . . . for your clients . . . for the future of their building?

Our catalog gives the technical data on Duwe products you need to have at hand. This ad can only serve to underscore the valued features of the DUWE SYSTEM — DULITE Roof Deck and Duwe Precast Joist. Please note:

- 2-hour Underwriters' rating — significant savings on insurance; vitally important in "years ahead" consideration.
- Exceptional insulating value — compared to other Roof Decks.
- High acoustical rating — a .75 noise reduction value.
- Performance; strength — resists damage from fumes, moisture. Another score in "years ahead" consideration.
- Low maintenance — weigh the greater economy in years of minimum maintenance.
- Lightweight with structural strength — construction is less complicated with the Duwe System and you can always be assured of maximum strength.

There's more to the story of the Duwe System. This catalog gives the details you want. It's yours for the writing.

DUWE

PRECAST CONCRETE PRODUCTS, INC. • P. O. Box 1277 • Oshkosh, Wis. 54901

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SOUND-ABSORBING MASONRY BLOCKS / These blocks, which make it possible for the structural part of a building to provide sound-conditioning, may be used for load-bearing walls as well as interior partitions. Soundblox derive their high sound absorption from a patented cavity-slot design: The cavities are closed at one end and have slots that enable the block cavities to act as damped resonators. Blocks can be coated with paint or glazed. • The Proudfoot Company, Greenwich, Conn.

Circle 327 on inquiry card

ROOF SLABS / Tullon, reported to be "strong, lightweight and non-combustible," is made of perlite aggregate concrete, with reinforcing steel. The bottom or interior side of the slab, which is available in standard sizes and various thicknesses, provides an acoustical ceiling. • Silbrico Corporation, Chicago.

Circle 328 on inquiry card

INFRA-RED HEATING UNITS / Three models offer 85- to 255-sq in. radiant surfaces and from 30,000 to 90,000 B.T.U. input with a radiating face temperature range of 1,600 to 1,650 deg F. The radiant source for the new line is all-ceramic tiles and patented high-temperature stainless steel rods, capable of withstanding 1,800-2,000 deg F. Heaters emit rays which do not heat the air, but merely the object they encounter. Benefits include: instant, uniform heat; silent operation; minimum dust circulation. • Detroit Radiant Products Company, Detroit.

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For more data, circle 105 on inquiry card
### METAL GRATING
A data and specifications manual describes welded and riveted steel and aluminum grating for flooring, platforms, walkways, decking and stair treads. The manual includes safe load tables and charts and load conversion formulae. • Klemp Corporation, Chicago.

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### STEEL COATINGS
Three bulletins describe ready-mixed Galvanox Zinc-Rich coatings and Capox catalyzed epoxy topcoats to provide high corrosion resistance for steel subject to high humidity and chemical contamination. • Wyandotte Chemicals Corporation, Hackensack, N.J.

Circle 416 on inquiry card

### ALUMINUM FACING SYSTEM
A brochure that explains a system of interlocking aluminum panels suggests a variety of design patterns and includes a color chart, product details, specifications, and design ideas. • Kawneer Co., Inc., Niles, Mich.*

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### BATHROOM ACCESSORIES—DOOR CHIMES
One color catalog shows the complete line of bathroom cabinets, mirrors and accessories. Another color catalog presents the full line of door chimes, bells, buzzers, transformers and push buttons. • Miami-Carey Division, The Philip Carey Manufacturing Company, Cincinnati.

Circle 418 on inquiry card

### GLASS APPLICATIONS
Dramatic and unusual use of glass is the subject of a 12-page quarterly magazine entitled “Creative Ideas in Glass.” • American Saint Gobain Corporation, Kingsport, Tenn.*

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### CERAMIC TILE FOR BATH DECOR
Many decorative schemes are presented in a 32-page full-color booklet that shows powder rooms, second baths, family baths, and special baths for men, women and children. • United States Ceramic Tile Company, Canton, Ohio.*

Circle 420 on inquiry card

### CERAMIC TILE
A 16-page color brochure shows typical applications of tile for many rooms of the house, suggesting a variety of individual designs. Available for 10 cents. • American Olean Tile Company, Lansdale, Pa.*

Circle 421 on inquiry card

### STEEL PIPE
"Basic Data—Structural Uses for Steel Pipe" contains examples that range from building frameworks to amusement park attractions to geodesic domes. • American Iron and Steel Institute, New York City.

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### STEEL BUILDINGS
A 20-page brochure on the use of Stran-Steel buildings in community and recreational projects ranging from schools to bowling alleys and churches discusses the styling, economy and investment aspects of the buildings. The brochure includes pictures and stories of buildings in which Stran-Steel systems were used. • Stran-Steel Corporation, Houston.*

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* Additional product information in Sweet's Architectural File

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### DETAILED DRAWINGS OF STEEL DECKING SYSTEMS

![Detailed Drawings of Steel Decking Systems](image)

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for individuality...
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Sherwin-Williams Bloc-Tex® is a new type of block filler that produces smoother and superior cement block surfaces. It is an entirely new aggregate-free filler, it may be applied easily by brush, airless or conventional spray. Quick-drying Bloc-Tex dries to touch in 2 hours. It may be top coated, if necessary, in 24 hours. When finished with two coats of masonry type paint, exterior surfaces will withstand the most severe weather conditions. For complete facts on Bloc-Tex for filling concrete block, use the coupon below.

**PROFESSIONAL COATINGS DIVISION**
**THE SHERWIN-WILLIAMS CO.**

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Please send me your free brochure B-901 on Bloc-Tex for filling concrete block.

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**For Concrete Block**
Litchfield Park: for some paradise in suburban Phoenix

A 12,000-acre site—once a cotton farm—18 miles west of Phoenix, Arizona is being developed into a new town community under the sponsorship of the Goodyear Rubber Company. When finished in approximately 25 years time, Litchfield Park will have a population of between 75,000 and 100,000 people, who will live in a series of villages grouped on either side of a central core (rendering, right) which will include colleges, museums, hospitals, offices, regional parks and shopping facilities and will extend for about four miles through the center of the town. Victor Gruen and Associates, with Edgardo Contini as partner-in-charge, are developing the master plan.

The architects have adopted a neighborhood approach to town planning, with the basic residential neighborhood accommodating between 500 and 800 residential units—apartments, detached and patio houses and town house clusters—which will be built around some kind of central recreational facility, either pool, golf-course or equestrian trail. Each neighborhood will have its own elementary school, but the schools of adjoining neighborhoods will be grouped together in anticipation of possible changes to the education system, which might require several buildings on a single campus. Villages—consisting of two or four neighborhoods—will have small village centers (rendering, below) containing some shopping and meeting areas for different age groups. Larger community centers with a high-school, shopping plaza and offices, will be sited to serve every 15,000 to 20,000 people.

The traffic plan provides a loosely interwoven grid of arterial roads, and a separate, secondary-path network connecting the neighborhoods and individual villages with one another. This secondary system is designed for pedestrians, cyclists and for electric carts.

Development work has already begun on the site of an existing small village, and designs for the first service station, community recreation and shopping centers are by Phoenix architect, Bennie Gonzales.

For more information on this and other rocks in our designer series, write for Catalog OV-32

VOGEL-PETERTON CO. “The Coat Rack People” ELMHURST • ILLINOIS

For more data, circle 108 on inquiry card
Don’t chain school children to an inflexible, immobile unit ventilator
Select the totally flexible Lennox DMS Heating-Cooling-Ventilating System

When you design the elements of flexibility into your schools be sure your thermal system will permit those elements to function. Unit ventilators will not. They must be firmly anchored against a permanent wall and permanently connected to hot or chilled water supply.

A Lennox direct multizone system, in contrast, permits total flexibility. For example:
It is roof mounted. Requires no floor space. No permanent walls.
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And if buildings are added, you simply put additional DMS units on the roof.
Each Lennox DMS provides room by room thermal control (up to 12 zones per unit). Each responds instantly to changes in weather or occupancy.
A DMS unit can provide 100% outside air to meet the ventilation demands of high occupancy or accelerated activity.
It will cool free, using outside air, any time temperatures are below 57°F. Mechanical cooling can be installed originally, or added any time.
A low silhouette (42"), and wide choice of outlet designs, impose no architectural limitations. In fact, design opportunities are unlimited.
The Lennox DMS provides the ideal learning climate, both thermally, and in terms of spatial flexibility. For information, write Lennox Industries Inc., 684 South 12th Ave., Marshalltown, Iowa.

Für mehr Daten, kreuzen Sie 109 auf der Anfragenkarte.

ARCHITECTURAL RECORD December 1966 229
First, build a flight test tower using 200,000 Republic High Strength Bolts

Soon, Saturn V, the largest, most powerful space vehicle ever launched, will thunder into flight for the first time. But, before this giant step in man's now certain journey to the moon, NASA's Apollo program engineers must have complete preflight knowledge of Saturn type vehicle's vibration and bending characteristics.

As one means of verifying the ability of the Saturn vehicles to resist stresses of launching and early flight, NASA's Marshall Space Flight Center, Huntsville, Alabama, has built the 360' dynamic test tower, shown at left in the photo above. The Saturn V boost vehicle will be placed in this tower and subjected to extreme vibrations, simulating actual flight conditions. Information thus gained will then be incorporated in the design of the vehicle's electrical control systems.

Obviously, for such a test to be possible, the test tower itself must be capable of withstanding the same violent strains applied to the space vehicle. Republic High Strength Bolts used in the test tower are equal to the task. New Republic Heavy Head
lt design permits tightening to greater clamping loads in ever before. This tightening force is transferred to its as clamping strength—an advantage impossible to duplicate with any other fastening method. In addition, lead length has been shortened to remove threads from shear plane and assure maximum shear strength. Saving time and cost in construction, Republic High Strength bolts are the original and final fasteners—and saving one cost, no washers need be used under new AISC and REA recognized “turn-of-the-nut” tightening methods.

Could there be better proof that Republic High Strength Bolts are the ultimate in reliability? You don’t have to be “shooting the moon” either, to take advantage of this remarkable new fastening method. Just call our local Republic representative, or send the coupon. It’s worth your time, whether you’re trying to rise to a e-story completion date or a 196x rendezvous in space.

STEELMARK of the American Steel Industry on a product assures you it is made of modern, versatile, economical Steel. Look for it on the products you buy.

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ON THE CALENDAR

JANUARY

3 22nd Annual Conference, Reinforced Plastics Division, Society of the Plastics Industry—Shoreham Hotel, Washington, D.C.; through February 3.

4-7 Winter Meeting, National Society of Professional Engineers—American Hotel, San Juan, Puerto Rico.

FEBRUARY, 1967

6-10 Environmental Engineering Conference, American Society of Civil Engineers—Statler Hilton Hotel, Dallas.

OFFICE NOTES

NEW FIRMS, FIRM CHANGES

Robert L. Mills, A.I.A. has opened an office on Water St., Blacksburg, Va.

Peter S. Sabin, A.I.A. has opened an architectural office at 230 California Ave., Suite 208, Palo Alto, Calif.


L. Edward Kime and Dennis W. Queenan, architects, and H. Richard Hanson and James B. Erard have been named associates by Richards, Bauer & Moorhead, Toledo architectural and engineering firm.


Donald W. Macpherson, Harry M. Kurki and Robert P. Breading have been named partners in the Philadelphia architectural firm of Harbeson Hough Livingston & Larson.

James H. Mildes, planner and architect, has joined the firm of Albert A. Hoover And Associates Architects, of Palo Alto, Calif.

continued on page 239
Kohler built this electric plant in 1922.

R. W. Twaddell bought it second hand in 1935

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Mr. Twaddell, of Sidney, New York, bought this 1922 model 1500 watt, 110 volt Kohler electric plant second hand in 1935. Today, after 44 years of service, it’s still performing... supplying power for house lighting, a water pump, toaster, vacuum cleaner, electric drill and radio. Occasionally it’s also used as a battery charger.

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*The name "Astrodome" belongs exclusively to Houston Sports Association, Inc.

The Detroit-based architectural and engineering firm of Harley, Ellington, Cowin and Stirton, Inc. has named Thomas A. Harkanyi, A.I.A. administrative designer. The firm also has appointed James A. Kilgore, A.I.A. as assistant chief of its architectural department.

ADDENDA


Correct credits for the Youth Pavilion at Expo 67 (October, page 176) should have read: architects: les Architectes Ouellet, Reeves, Alain; interior designers: Francois Lamy and Associates.

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ABBREVIATIONS: BTS—Building Types Study; Archts.—Architects; Partner-in-Charge—PC; Standards—BC; Building Components; RR—Record Reports


Asian Art—July 1966, pp. 11-22


SEMI-ANNUAL INDEX

ARCHITECTURAL RECORD

ARCHITECTURAL RECORD

VOLUME 140
JUNE-DECEMBER 1966

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Campbell & Wong & Assocs., archts.; Travelodge Motel, Pacific Marina, Alameda, Calif.—Aug. 1966, BTS, pp. 132-133

Candelwood Junior High School, Long Island, N.Y.; Frederick P. Wieswuss Assocs., archts.; “New school has three kinds of flexible space,” Candlewood Junior High School, Long Island, N.Y.; Frederick P. Wieswuss Assocs., archts.; “New school has three kinds of flexible space”—Sept. 1966, AF, pp. 223-226


Avon Old Farms School, Pierpont Student Activities Center, Avon, Conn.; Sherwood Mills and Smith, archts.—Dec. 1966, BTS, pp. 144-145

Amman & Whitney, engrs.; Skidmore, Owings & Merrill, archts.; Oakland-Alameda Coliseum—July 1966, p. 157

Andrews, John, archt.; Current Works: Scarborough College, Scarborough, Ont.; Bellmere School, Scarborough; African Place Pavilion, Expo '67; Project for an Apartment Building, Program Study for Dormitory Rooms; Dormitory for University of Guelph, Ont.; Master plan study for University of Toronto; Red Coach Inn, Mandeville, Jamaica—July 1966, pp. 189-190

Apartment. John Hancock Building, Chicago; Skidmore, Owings & Merrill, archts. and engrs.—July 1966, pp. 154-155, 232-233

Banks, Manufacturers Hanover Trust Co., New York City; Skidmore, Owings & Merrill, archts.; Gorden Bunshaft, partner-in-charge of design—July 1966, pp. 189-190

Beckett, Welton and Assocs., archts.; Composite Medical Facility, March Air Force Base, Riverside, Calif.—Oct. 1966, BTS, pp. 210-211

Bellerive School, Scarborough, Ont.; John Andrews, archts.—Sept. 1966, pp. 161-172


Blue Dolphin Restaurant, Marina, San Leandro, Calif.; Jens Hansen & Assocs., archts.—Oct. 1966, pp. 166-167

Bolton, P. M. Assocs., archts.; Private Residence, Houston—Sept. 1966, pp. 191-194

Boston Architectural Center; Ashley, Myers & Assocs., archts.—July 1966, p. 206


Breuer, Marcel and Herbert Beckhard, archts.; Stillman House, Litchfield, Conn.; Van der Wall House, Amsterdam, The Netherlands;


H


I


J


K


ARCHITECTURAL RECORD December 1966 249

Koerfer House, Moscia, Tessin, Switzerland; Marcel Breuer and Herbert Beckhard, archts.—Nov. 1966, pp. 133-134.

L


Lincoln Elementary School, Columbus, Ind.; Birkerts, Gunnar archts.—Aug. 1966, pp. 95-97.


M

Main Place, Dallas, Tex.; Skidmore, Owings and Merrill, archts.—Nov. 1966, B.T.S., pp. 162-165.


N

Nassau County Public General Hospital (Meadowbrook), East Meadow, N. Y.; The Office of Max O. Urbahn, archts.—Oct. 1966, B.T.S., pp. 199-203.


O


Oberlin Home, Oberlin, Ohio; Meate, Kesslar and Assocs., archts.—Nov. 1966, pp. 138-139.


Q

Queen’s Tower of the Barnes Hospital, St. Louis, Mo.; Murphy and Mackey, archts.—Oct. 1966, B.T.S., pp. 214-216.


R


R}


R}


Samoa, Sherwood, Schools. Bellmere Saint Bedes Schmertz, Mildred F. 

Restaurants. 1966, pp. 194

School has three kinds of flexible-therapy and how they affect 


Travelodge Motel, Pacific Marina, Alameda, Calif.; Campbell & Wong & Assoc., archts.- Aug. 1966, BTS, pp. 132-133 

U

Union Carbide Building, N.Y.C.; Skidmore, Owings & Merrill, archts.-July 1966, p. 154 

University of California. University Research Li Brinn, Donald; Cummings, Fred D.; Schaps, M. C. -Sept. 1966, BTS, pp. 214-217 

Field House, Santa Cruz; Callister, Payne & Ross, archts.-July 1966, pp. 146-148 

University of Detroit. Fisher Administrative Center; Gunnar Birkerts, archts.-Aug. 1966, BTS, pp. 204-205 

University of Louisville. Medical Complex, Louisville, Kentucky; Smith, Hinchman & Grylls, archts.-Oct. 1966, pp. 182-183 

University of Minno. University City, Italian; Giancarlo De Carlo, archt.-July 1966, pp. 234-235 

Urban Public Schools of Louisville, Ky.; Frank, archts.-Sept. 1966, pp. 134-135 

V

Van der Wal House, Amsterdam, The Netherlands; Marcel Breuer and Hamilton Smith, archts.-Nov. 1966, pp. 120-131 

Voorhees, Alan M. & Assoc., Inc., transportation and planning consultants; Lower Manhattan Project; Whitley, Conklin and Rossant with Wallace, McHarg, Roberts and Todd, archts.-July 1966, p. 33 

W

Waiohai Resort Hotel, Poipu Beach, Kauai, Hawai; Vladimir Ossipoff, arch.-Aug. 1966, BTS, p. 134 

Wallace, Jones/Mab and Jones/Architects, inc., archts.; Poplar-Perkins Building, Memphis, Tenn.-Nov. 1966, BTS, p. 176 

Wallace, McHarg, Roberts and Todd with Whitley, Conklin and Rossant, archts.; Alan M. Voorhees & Associates Inc., transportation and planning consultants; Lower Manhattan Project, archts.-Aug. 1966, p. 128-129 

Warnecke, John Carl & Assoc., archts.; Ailsalom Hotel and Conference Grounds, Pacific Grove, Calif.-Aug. 1966, BTS, pp. 128-129 


Dostick, John, archts.-October 1966, AE, pp. 134-135 

Dostick, John, archts.-October 1966, AE, pp. 134-135 

Operations Society for想了, null; null
ADVERTISING INDEX

Pre-filed catalogs of the manufacturers listed below are available in the 1966 Sweet's Catalog File as follows.

A Architectural File (green)
I Industrial Construction File (blue)
L Light Construction File (yellow)

A
Aerofin Corporation .......................................................... 72
Alloy Chemical Corp., Fibers Div. .......................... 84-89
A-L Altec Lansing Corporation ........................................... 242
A-L Amerada Glass Corporation ........................................... 178
I American Air Filter Co., Inc. .......................................... 84-85
I American Bridge Div., U.S.S. ........................................... 206-209
American Gas Association .............................................. 2, 38-39, 47
A American Olean Tile Company ........................................ 2nd Cover
A AMTEK, Inc., Troy Laundry Machinery Div. ................. 180
A Anchor Post Products, Inc. ............................................. 58
Architectural Record ....................................................... 246-247
A-L Armo Steel Corp. ....................................................... 173
A-L Armstrong Cork Co. ................................................... 181
A-L Azrock Floor Products ............................................... 3rd Cover

B
A Bally Case & Coolever, Inc. .......................................... 96-97
A Beneke Corporation ...................................................... 13
A-L Bethlehem Steel Corporation .................................. 185 to 186
A-L Borden Metal Products Co. ....................................... 37

C
A-L Carlisle Tire & Rubber Div., Carlisle Corp. .......... 210
Carrier Air Conditioning Co. ......................................... 2
Cast Iron Soil Pipe Institute .......................................... 74
Chemstrand Company ....................................................... 78
Chicago Faucet Company .............................................. 182
Cissell Mfg. Co., W.M. .................................................... 189
Commercial Carpet Corp. ................................................ 33
Concrete Reinforcing Steel Institute, 226-227
Cortinex Company ....................................................... 28
A-L Crane Company ......................................................... 29 to 32
A-L Crawford Door Company ........................................... 167

D
A Davenport, A.C., & Son ................................................. 235
Day-Brite Lighting, Div. of Emenon Electric ............... 95
A Dover Corp., Elevator Div. ........................................... 162
A-L Dow Chemical Company ........................................... 168
A-Dufont de Nemours & Co., E.I .................................... 174
A Durrun Co., Inc. .......................................................... 1
A-L Dur-O-Wal, Inc. ......................................................... 190
A-L Duve Precast Concrete Products, Inc. ............... 218

E
A-L Easy-Heat Climate Control Div., The Singer Co. ....... 200
Edison Electric Institute ................................................... 25
Edwards Company, Inc. ..................................................... 160-161
Eggers Hardware Products Corp. ................................. 16

F
A-L Fiat Products Dept., American Cyanamid Co. ....... 184
A FMC Corp., Inorganic Chemicals Div. ..................... 67
A Follansbee Steel Corp. .................................................. 213

G
A-L General Electric Co. .................................................. 179, 244-245
Glen Raven Cotton Mills, Inc. ....................................... 68
A Global Steel Products Corp. ........................................ 70
A Glynn-Johnson Corp. ..................................................... 83
Goodyear Tire & Rubber Co. .......................................... 65, 216
A-L Graco Steel Products Co. ........................................... 63
A-L GREFCO, Inc., Building Products Div. .................. 34

H
A Hartmann-Sanders Co. ............................................... 207
A Hastings Aluminum Products, Inc. ......................... 184
A Haughton Elevator Company ....................................... 70
A Haws Drinking Faucet Co. .......................................... 176
A-L Ic Products Company ................................................ 70, 92, 182, 212
A-L I Hilliard Chemical Co. ............................................. 234
Holophane Co., Inc. ....................................................... 169

I
A-L Inland Steel Products Co. ......................................... 73
International Exposition Co. ......................................... 76
A-L Irving Subway Grating Co. ...................................... 198
A ITT Nesbitt, Inc. ........................................................ 238

J
A Jamison Cold Storage Door Co. ................................. 55
A-L Johns-Manville ......................................................... 73
A-L Jones & Laughlin Steel Corp. ................................. 139

K
A Kaiser Steel Corp. ....................................................... 32-6-32-7
A-L Kelite, Inc. ............................................................. 7
A-L Kohler Company ......................................................... 40, 236-237
A-L Koppers Company .................................................... 49 to 54
K-S-H Plastics, Inc. ....................................................... 215

L
A LCN Closers, Inc. ........................................................ 80-81
Lehigh Portland Cement Co. .......................................... 170
Lennox Industries, Inc. ............................................. 228-229
LeRoy Construction Services ..................................... 32-12
A Levolor Lorentzen, Inc. ............................................. 232-233
A-L Libby-Owens-Ford Glass Co. .................................. 11
Lighting Products, Inc. .................................................. 192
Lockwood Hardware Div., Independent ...................... 217
A Loren Cook Company .................................................. 184
A Ludowici-Celandon Company ..................................... 243
A Lyon Metal Products, Inc. ............................................ 79

M
Marble Products Company .............................................. 235
A-L Marlite Div., Masonite Corp. .................................... 8
McKinney Sales Co. ......................................................... 92
McQuay, Inc. ................................................................. 91
Modern Partitions, Inc. .................................................. 196-197
I Modine Mfg. Co. ........................................................ 98-99
A-L Musson Rubber Co., R.C. ......................................... 184

N
A-L Natco Corporation ................................................... 56-57
National LP Gas Market Development Council ............... 66

O
A Otis Elevator Company ................................................ 90
A Ozite Corporation ......................................................... 171-172

P
A-L Pella Rolscreen Company ......................................... 193-194
A-L Pennsalt Chemicals Corp. ......................................... 77
A-L Pittsburgh Plate Glass Co. ....................................... 219 to 222
A-L Pittsburgh Plate Glass Co., Coatings & Resins Div., 206
Paints ................................................................. Portland Cement Association 201 to 204
A-L Products Research & Chemical Corp. ..................... 93

R
A-L Red Cedar Shingle & Handsplit Shake Bureau ........... 13
A Republic Steel Corporation ......................................... 230-231
A-L Reynolds Metals Company ....................................... 69
A Rixson, Inc. ............................................................... 89
A-L Robertson Co., H.H. ................................................. 175
A Rohn and Haas Company ............................................. 71
A-L Ruberoid Company ................................................... 226
A-L Ryerson, Joseph T. & Son, Inc. ....................... 17 to 24

S
A A. Collins Mfg. Co. ...................................................... 82
A-st. Joe, Metals Div. ..................................................... 94
Sandvik Steel, Inc. ......................................................... 211
A Sargent & Company ...................................................... 199
A Sargent & Greenleaf, Inc. .......................................... 14
A Schaefer, Commercial Refrigeration Div., 230-231
Studebaker Corp. ......................................................... 232-233
Shell Chemical Co. ......................................................... 26-27
A Sherwin-Williams Co. .................................................. 226
A Simmons Co. .............................................................. 59 to 62
A-L Sloan Valve Company ............................................... 4th Cover
Solar, a Div. of International Harvester Co. .......... 4th Cover
Southern California Edison Co. ................................. 32-6-32-7
Square D Company .......................................................... 57
A Standard Conveyor Company ..................................... 58
A Steel Joist Institute ...................................................... 177
Stresssteel Corporation .................................................. 45
A Summitville Tiles, Inc. .................................................. 183
Sweet's Catalog Service .................................................. 25
A-L Symons Mfg. Co. ....................................................... 76

T
A-Talk-A-Phone Company ................................................ 214
A-L Taylor Co., Halsey W. .............................................. 205
A-J-1 J-1M Company ........................................................ 254
A Tile Council of America, Inc. .................................. 254
A Tremco Mfg. Co. .......................................................... 190-191
A Troy Laundry Machinery Div., AMTEK, Inc. .............. 180

U
A-L United States Steel Corp. .......................................... 239
A United States Steel Corp, (subs) ....................... 200-209
A-L Upco Company .......................................................... 96
A-L Uvalde Rock Asphalt Co. ......................................... 3rd Cover
Index to buying information

ARCHITECTURAL CATALOG FILE

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