A CONTEMPORARY ART MUSEUM IN CATALONIA BY SERT, JACKSON & ASSOCIATES

YALE UNIVERSITY OLD CAMPUS RENOVATION

NEW MINNEAPOLIS GOVERNMENT CENTER BY JOHN CARL WARNECKE & ASSOCIATES

ANCHORS AWEIGH ON CHICAGO'S NAVY PIER

BUILDING TYPES STUDY: STORES AND SHOPS

FULL CONTENTS ON PAGES 10 AND 11

ARCHITECTURAL RECORD

MARCH 1977 - A McGRAW-HILL PUBLICATION FIVE DOLLARS PER COPY
The Brigantine® sheet vinyl floor from Armstrong.

In the school of hard knocks, it's the sassy way to keep up appearances.

The school is West Hardin Elementary Crump, Tennessee. Where the students from kindergarten through sixth grade, amounting to 270, and where the clean, functional design of the architecture is enlivened by the beauty of Brigantine Vinyl on® on the floor.

School authorities selected Brigantine sheet flooring for three sensible reasons: its lively, attractive appearance; its maintenance; and its will to survive in a hive of active, busy children.

While Brigantine can be found in very few of the classrooms, nowhere are its characteristics shown to better advantage than in the school's all-purpose "commons". Here, the students play basketball (boundary lines are painted on) and other games, eat their lunches, assemble for things, watch theatrical performances. All that activity takes place on Brigantine's beautiful face.

Brigantine's beauty lies in its dirt-repelling pattern and its wide array of design-enhancing colors—two of which can be seen in the classroom, its durability is provided by its tough vinyl composition that stands up to the constant running, jumping and bouncing of youthful feet. A composition, by the way, that prevents spills from soaking in, thus allowing the custodial staff clean up in short order.

The fact is, wherever long-lasting, cleaning good looks are called for, you find Brigantine at the head of the class. A practical floor covering that comes in rolls up to 90 feet long that eliminates a lot of seams. A handsome flooring that can attend the school of hard knocks and graduate with honors. To learn more, send for a free copy of our "Firsts" booklet which describes Brigantine and other Armstrong commercial floors.

Armstrong, 303 Rock Street, Lancaster, Pa. 17604.
The Synercon™ 60 Ceiling System from Armstrong.
A new standard of design flexibility produces a new high in energy savings.

The Synercon 60 Ceiling System from Armstrong is all new from the grid to the board, from the lighting options to the air handling. More important than even its newness, however, is its innovation. Innovation that serves to increase design flexibility, decrease energy consumption, and enhance lighting quality.

The new lighting starts with a pendant fixture designed to provide highly efficient task lighting that can save as much as 65% in electrical costs when compared to conventional-type recessed troffers. It accommodates two 40-W lamps which result in 70 or more footcandles at the work surface and is offered with a special double lens that controls brightness and effectively beams the light exactly where it's needed. What's more, with the fixture suspended, the ceiling is an acoustical material.

With the Synercon 60 Ceiling System, however, that's only the start. Because there are two other lighting options as well. The newly designed recessed troffer you see above that also saves energy because it normally requires fewer fixtures than competitive systems. And the energy-efficient sodium fixture has b
especially designed to control brightness without seriously reducing the lamps' efficiency. Optional polarized lenses with these fixtures can further lower energy requirements as well as improve lighting quality by reducing veiling reflections.

With all three systems, the lighting efficiencies suit in both immediate and long-term cost reductions. To deliver 70 footcandles, the pendant fixture can require only .9-1.0 watts per square foot; the high-pressure sodium, only 1.4-1.5; the standard troffer, only 1.9-2.0.

The new grid is three inches wide, with a flat angle, and features a 1/8” black reveal that extends down the side of the recess and takes partition studs. It is a five-foot on-center hanging capability and can be 30% slotted for air distribution.

The new board is nondirectional Georgian jich, combined with the flat grid design, produces a subtle, unobtrusive look. A new super acoustically efficient board called Silok™, shown in main illustration, is also available for use in open plan spaces.

The new air handling gives you a choice of a high-capacity five-foot-long air bar designed for constant-volume systems as well as two variable-volume systems—each with two options—that save energy in several ways. They require no reheat, thus saving the cost of reheating cooled air. They need no external power to operate either valves or thermostats. And by reducing air quantities, they allow a reduction in the size of ductwork and fans.

With all its newness, innovation, and energy efficiencies, the Synercon 60 Ceiling System gives you a sum total of flexibility you’ve never had available before. In fact, this new system offers so much, we think you’ll want to read about it in depth. Write us now for all the technical details. Armstrong, 4203 Rock St., Lancaster, Pa. 17604.

For more data, circle 2 on inquiry card
Letters to the editor
We were all very excited about the Baltimore-Washington International Airport article that appeared in the Oct. 1976 issue of RECORD. I would like to sincerely thank you for your interest in the professional manner in which the article was presented and for the exposure for the BWI Terminal Expansion Program.

Dean S. Roxanis
Public Affairs Specialist
Baltimore-Washington International Airport
Maryland Department of Transportation

I wish to protest Edgar Tafel’s November “review” of John Sergeant’s fine book, Frank Lloyd Wright’s Usonian Houses. It seems to me that a serious journal reporting on a serious book ought to require a serious review. Indeed, we have a gap consisting of tired reminiscences, a defense of Tafel, a gratuitous remark about the author’s nationality, and the suggestion that since he “was not there,” Sergeant is disqualified to write of Wright’s career in the 1930s.

The job of a reviewer is to report content, to tell what is in a book, to evaluate its thesis, its scholarship, its style, and to indicate its interest for a particular audience. Tafel does none of this. What he does do is remind everyone that he was on the job during the halcyon days. What reason, therefore, does Tafel give for Sergeant’s alleged unfamiliarity with Usonian building problems? He was not there. With one swipe, research, of the legend of Tafel, it seems unaware of the chief argument of the book contained in its second half. This sets up Wright’s social and political views, and relates them to events in the 1930s and the decentralized context for all his subsequent work. It also enlarges Wright’s definition of “organic.” All this Tafel ignores.

So far as conveying an objective view of Wright goes, I think that it is unfortunately an advantage being physically far from Taliesin. Too Tafel’s Tafel, that to write what he must be there, it must be said that this may be subjective, as the participant sees events through the lenses of his own preconceptions and prejudices. Someone who was there, even from another generation, is more distant from events but can interpret them alongside current concerns and relevancies. Both have their value.

John Sergeant
University College
London

In your January 1977 Letters column, Edwin C. Rubin wrote to you expressing concern over the absence of personal credits on the Trio Industries building published in your November issue. Responsibility for any omission lies entirely with us.

This project was produced by a team of dedicated professionals on our staff too numerous for individual attention. To have singled out any one (or two, or three) would have shorted all others. Furthermore, the team concept is historical with our firm and we see no reason to change it at this time.

Harvey P. Clarkson, president
Shreve Lamb and Harmon Associates, P.C.
New York, N.Y.

ARCHITECTURAL RECORD (Combined with Architectural Record, architecture and Engineering)

March 1977, Vol. 161, No. 3

ARCHITECTURAL RECORD
500 Fifth Avenue
New York, N.Y. 10017

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UNSUBSCRIBE ARCHITECTURAL RECORD, P.O. Box 430, Hightstown, N.J. 08520. Provide old and new address, if requested. Index cards with subscriber information. SCIENTIFIC AND TECHNICAL INDEX. Available to all subscribers. All subscription service letters, comments $15.00 for architects, engineers, other individuals in the fields served: others $20.00. Change of address: $15.00 to architects, engineers, and others $40.00. Single copies $1.00 per issue. PRIVACY GUARANTEE: Publisher agrees to notify all subscribers that part of subscription price applies to classified advertising.


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Turn those sound-reflecting walls into sound absorbers. With Soundsoak Wall Panels. And add a lot of beauty while you subtract a lot of noise. To learn more, write Armstrong, 4203 Rock St., Lancaster, Pa. 17604.

For more data, circle 3 on inquiry card
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Through longtime involvement in both construction and manufacturing, Inryco has become the recognized leader in the steel framing field. We've worked closely with steel framing contractors to develop system innovations and improvements in fabrication and erection techniques. We stand ready to assist your contractor in developing proper framing construction techniques to help you achieve the maximum benefits of our systems.

Consider our systems and services for your next project.
Other companies manufacture and sell steel studs and joists. None have the experience, capability or desire to provide the extras you get from Inryco. Please review the information on Inryco/Milcor Steel Framing Systems in Sweet's Architectural File (section 5.3/In) or Light Construction File (section 5.3/Inr). Then give us a chance to discuss their application to your projects by contacting:
Milcor Division, INRYCO, Inc.; Dept. C-4033; P.O. Box 393; Milwaukee, WI 53201.

Inryco
an Inland Steel company

For more data, circle 4 on inquiry card
Typical applications...low rise and high rise... residential, commercial, institutional, industrial
"General Electric's Weathertron® is the No. 1 selling heat pump in new construction."

"That should pop Aunt Sadie's beaded umbrella!"

It took a lot of good reasons to make the GE Weathertron® heat pump number one among specifiers and architects. Here are the most important.

First is the Climatuff™ Compressor with its record of dependability in over a million and a half installations.

Spine Fin™ condenser coils eliminate many brazed connections where leaks can occur.

You can choose from 18 different Weathertron models—18,000 to 240,000 BTUH—for residential and commercial applications, plus a complete line of other heating & cooling equipment.

And you can offer the General Electric National Service Contract on the residential heat pump.

All this from GE, the company that pioneered the heat pump back in 1935.

If you're contemplating an air conditioning installation, get in touch with a General Electric Central Air Conditioning dealer. He's in the Yellow Pages under "Air Conditioning Equipment and Systems: The General Electric Weathertron... America's #1 Selling Heat Pump.

For more data, circle 5 on inquiry card.
The defense never rests on the roof of the Cuyahoga County Justice Center!

To defend the roof and plaza decks of the Cuyahoga County Justice Center in Cleveland against energy losses and the onslaught of the elements was of prime importance to the designers. Over 200,000 square feet of deck had to remain water tight, perform efficiently and have little or no maintenance for years. All-weather Crete Insul-Top and Plaza Systems were used. Two unique materials account for the success of these systems. One is All-weather Crete, a monolithic insulating fill applied hot and dry, and having an excellent K factor. The other is Alasco RAM, a rubberized asphaltic waterproof membrane that retains its elastic “life” indefinitely. On both roofs and plazas in the Justice Center, Alasco RAM was poured to form a seamless waterproof membrane directly on the flat structural deck. Protection board was adhered to the hot Alasco RAM. All-weather Crete was then compacted over the membrane system, and sloped to drains. The result—a seamless insulating barrier with positive water runoff. Thus, for the life of the building, AWC defends the membrane against thermal shock, ultra-violet rays, the elements, puncture and water ponding. Send for AWC brochure.
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Amassing the investment capital required to produce some measure of financial independence is a problem for many younger architects. Mark Pollard—senior account executive with Merrill Lynch, Pierce, Fenner & Smith, Inc.—prescribes a combination of conservative investments for capital growth.

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G. Neil Harper, financial management consultant and engineer, describes the recent integration of AIA cost-based compensation guides into an automated basic accounting system for design firms.

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It's looking bigger by the minute
George A. Christie, vice president and chief economist for McGraw-Hill Information Systems Company, forecasts a record $123 billion in total construction contract value this year.
TURES

Homage to Catalonia: a contemporary art museum in Barcelona by Sert, Jackson & Associates

Designed to exhibit the work of Joan Miró, donated to the City of Barcelona by the painter himself, the building is a further development of formal ideas that have long preoccupied architect Josep Lluis Sert.

Yale University Old Campus renovation

Architects Edward L. Barnes and Herbert S. Newman Associates have renovated four late 19th century dormitories in a manner that makes the most of their unique architectural character.

Impressive new Government Center features grand atrium space

A new public building in downtown Minneapolis has been designed by John Carl Warnecke & Associates, featuring a dramatic atrium 350 feet high with exposed structural diagonal braces.

Anchors aweigh on Chicago's latest amenity

Stretching three-fifths of a mile out into Lake Michigan, old Navy Pier, as refitted by Chicago's Bureau of Architecture, is underway once again — a relentlessly nautical mix of commercial, cultural, and recreational pursuits.

BUILDING TYPES STUDY 499

115 Stores and shops

In the intensely competitive atmosphere of suburban retailing, an arresting facade can bring in the business. This Building Types Study shows two different approaches to the problem of attracting customers. One solution features a sophisticated use of high-style building materials. The other approach is radical — designed by architect-sculptors to shock.

118 Burdines Department Store

Tampa, Florida
Reynolds, Smith and Hills, architects

124 Best Products Company

Houston, Texas
SITE, Inc., architects

126 Best Products Company

Sacramento, California
SITE, Inc., architects

128 Best Products Company

Two proposals for Southern California
SITE, Inc., architects

ARCHITECTURAL ENGINEERING

131 How much solar heating is economical for a house?

The extent depends upon a number of factors: the weather, the availability of sunlight, added initial system costs, and fuel cost escalation. Architect Don Watson and engineer Fred Broberg show that where not much sun is available, perhaps only a domestic hot water solar system will save money. Where there is lots of sun, more money is saved with 70 per cent or more solar heating. But in all cases a major influence in potential savings is how much the cost of conventional fuels is likely to escalate.

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NEXT MONTH IN RECORD

Building Types Study 500:
Looking back over forty years of building types

In honor of its 500th Building Types Study, RECORD has invited two brilliant "historicizing architects," Charles Moore and Richard Oliver, to assess the studies from 1937 to the present. Their analysis will focus upon the evolution of the form of the traditional building type as found in schools; on new building types such as the drive-in and the recycled building; the evolution of new patterns of living as expressed in the everyday house and the vacation house; and the question of style as best shown in churches, stores, restaurants and bars.
Finally, GAF introduces the first truly color coordinated Architectural Floor Tiles. So now, when you decide on or you can match with and or blend with or highlight with or decide on or and match with or contrast with or even. Whatever. You can create it with the first Architectural Floor Tile Line made to go beautifully with itself in 45 colors, 26 of them new for 1976. Beautiful. GAF Architectural Floor Tiles.
Mayor Goldschmidt has said some sound advice for meaningful action on the local level:

1. "If the cities want housing—both new housing and housing rehabilitation—we will have to take the initiative; and that may require us to do any or all of the following:
   1. "We can condemn old, substandard, and often vacant dwellings and sell them to rehabilitation contractors . . ."
   2. "We can cut the time and cost of development and rehabilitation by aiding with land assembly. We can guarantee water and sewer services to these assembled lots, and ensure that all required development compliances are met when we sell.
   3. "We can provide water-rate incentives for sprinklering units where fire codes now make it impossible to build with wood.
   4. "We can offer land write-downs, tax increments, and tax incentives.
   5. "Because time is money, we can and should shorten time for developers and rehabbers by simplifying our permit procedures.
   6. "We can recognize that there is no one right kind of housing. If what we seek is home ownership, the traditional single-family home is not the only way to get it. Condominiums for middle-income citizens should be considered an alternative—and if they meet public objectives, we should be devising incentives, tax and otherwise, to make them profitable.
   7. "We can 'package' opportunities by aggressively taking the initiative to match investors, lenders, developers and neighborhoods with the opportunities.
   8. "We can write rehabilitation codes to replace or supplement our housing codes. Our codes were written years after most of our existing housing was built, and their excessive standards now frustrate our avowed conservation objectives. We can write codes that are both safe and supportive of our public purposes—with reduced costs and frustration."

Summing up, Mayor Goldschmidt said: "If we want housing, these are the initiatives we can take to get the job started. While it once looked hopeless, we now have new hope. . . . And we have a new sense of control and a feeling that we have a new opportunity to control the shaping of our cities."

This kind of do-it-yourself and positive attitude seems not only refreshing—but very practical—at a time when so many problems are pressing upon the Federal government. It is the spirit that initiated all of the successful "hometown" rehabilitation we wrote about in the December RECORD. And it seems to me to be a cause which not just mayors—but architects everywhere—need to put their commitment and efforts behind.—Walter F. Wagner Jr.
TESTS PROVE:

Of the leading roofing systems, Fiberglas Perma Ply-R withstands thermal shock better than any other.
The results are in.
Grueling, independent tests by Bowser-Morner Testing Laboratories—using National Bureau of Standards performance criteria for built-up roofing systems—have proven what we've been saying all along:
When it comes to thermal shock performance, our Fiberglas® Perma Ply-R built-up roofing system is superior to conventional systems.
As defined by the National Bureau of Standards, "The Thermal Shock Factor (TSF) is an indicator of the root membrane's ability to withstand the normal temperature changes of its environment. Values of the coefficient of expansion, tensile strength, and load-strain modulus can be used to calculate the TSF."

The heart of our system is the unique, inorganic Perma Ply-R felt. It works two ways to give the system its strength.
First, when daily temperature changes cause a roof to expand and contract, Perma Ply-R is the best reinforcement it can have. That's because the Perma Ply-R felt is made of strong, continuous strand glass fibers. So its physical strength characteristics are similar, both longitudinally and transversely.

Second, Perma Ply-R helps create a monolithic roofing system. The strongest kind of system there is. The reason: Perma Ply-R is a porous felt. So it meshes totally with the bitumen.

What does all this mean to anyone who's faced with specifying a built-up roofing system?

Simple.

Properly installed, our Perma Ply-R system minimizes the possibility of splitting, blistering, and internal deterioration of membranes. It has the potential to outlast any other BUR system money can buy.

If you want to see the "Thermal Shock Performance Comparisons," please contact your local Owens-Corning representative or write: M. H. Meeks, Owens-Corning Fiberglas Corp., Fiberglas Tower, Toledo, Ohio 43659.

They've got the test results that prove every word.

Our Perma Cap surfacing sheet combines two materials: Fiberglas—so it's tough, won't warp or rot. And inert, noncombustible white ceramic granules that reflect sunlight and help minimize thermal shock.

Our Fiberglas Perma Ply-R is a porous felt. So it can mesh with the bitumen, creating a monolithic roofing system that minimizes interply blistering and adds to the roof's outstanding thermal shock performance.

Our Fiberglas roof insulation has its own Fiberglas reinforced asphalt cover. So the bitumen can be applied directly to it, making the insulation an integral part of the membrane.

Owens-Corning is Fiberglas

For more data, circle 8 on inquiry card
Will your statement endure until they can choose for themselves where to live and work?

The architect is faced with a unique challenge: the buildings he designs are both private as well as public assets that must meet both the economic needs of business and the esthetic demands of the community.

During the past ten years, Fluropon® has made a major contribution to both architectural design and economics. Fluropon® is the leading Kynar 500® fluorocarbon coating formulated full-strength to assure maximum longevity of the metal panel finishes.

There are many practical reasons to specify Fluropon: low-cost maintenance, long-life color stability for matching building additions, superior adhesion to the substrate and long-term resistance to corrosion and to many common atmospheric pollutants.

But beyond the practical benefits, a beautiful work can make an enduring statement to the community: here is a place where men and women can live and work in harmony with their environment.

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Write for complete information on Fluropon Architectural Coating, including technical product specifications, colors and uses.

*Fluropon meets Pennwalt license requiring 70% Kynar 500, Pennwalt's registered trademark for its polyvinylidene fluoride resin.

Fluropon®: The full-strength fluorocarbon finish for architects who want to make an enduring statement.

For more data, circle 9 on inquiry card
How Robinson's saved

Metalarc lamps help cut lighting energy use 41%—and make the merchandise look great.

Department store lighting: if it helps move the merchandise, it's good. If it doesn't, it isn't.

But today, it has to save energy, too.

This is how Sylvania Metalarc lamps helped give the best of both worlds to J. W. Robinson's 158,000-square-foot Wester, California store.

Robinson's didn't decide on lighting for this store without a lot of planning and testing first.

The tests took place in a 3,600-square-foot lighting lab in the main store. They tested numerous kinds of lighting for color, energy use, dramatics. And, of course, customer reaction.

The winners? Sylvania 175-
45,000 a year on its light bill.


Metalarc lamps' excellent color rendering, point-source illumination, and efficient energy use are an unbeatable combination. Ill told, the Westminster store requires only 2.98 watts per square foot for lighting. That's 41% less than the average 5.1 watts in the company's older stores.

70% more from every lighting watt...

$45,000 less per year to light this modern store.

To say nothing of the capital saving because of fewer fixtures.

Sylvania Metalarc lamps made a large portion of these savings possible.

How do you light a department store from scratch?

Start with Metalarc lamps...

For more details on these or any other Sylvania HID lamps, see your Independent Electrical Distributor. Or write Sylvania Lighting Center, Danvers, Massachusetts 01923.
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where all our energies
are aimed at reducing
your energy costs.

We guarantee that Bally
Coolers/Freezers with special
4-inch urethane insulation will
use less electricity, at lower
cost, than 80%* of the
Walk-Ins manufactured today.

It's one more reason why you should buy Bally.

Bally is the world's leading producer of Walk-In Coolers/
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any size for indoor or outdoor use... easy to enlarge or
relocate. Refrigeration systems from 50°F, cooling to
minus 30°F, freezing. Subject to fast depreciation and
investment tax credit. (Ask your accountant.) Bally Case
ADDRESS ALL CORRESPONDENCE Dept. AR-3

*Our estimate of the number of com-
petitive Walk-Ins being manufactured
with 21/2" thick urethane... or 3" thick
urethane... or wood frame panels
with urethane butted in place... or
fiberglass... or styrofoam... or
other conventional materials.

For more data, circle 11 on inquiry card
Announcing the 1976 winners of the Owens-Corning Energy Conservation Awards

Winner, Institutional category
Allen and Miller, Architects, Santa Ana, California, for the Fremont Elementary School, Santa Ana, California

Winner, Special category
Stephen B. Jacobs & Associates, New York, N.Y., for the Printing House, a former loft building in New York City

Winner, Governmental category
Kansas Architects and Planners Associated, Lawrence, Kansas, for the Federal Office Building, Topeka, Kansas

Honorable Mention, Governmental category
Unthank Seder Poticha Architects, Eugene, Oregon, and Marquess Engineering Company, Springfield, Oregon, for the Lane County Public Service Building, Eugene, Oregon

Honorable Mention, Commercial category
Taylor and Collum, Architects, Atlanta, Georgia, for the Shenandoah Solar Community Center, Shenandoah, Georgia

Honorable Mention, Institutional category

The 1976 Energy Conservation Awards Jury
This year's winners were selected by:
John Street, chief architect, John Portman Associates, Atlanta, Ga.
Charles Schaffner, senior vice-president, Syska & Hennessy, Inc., N.Y.C.
Nathanial Curtis, partner, Curtis & Davis Architects and Planners, New Orleans, La.

For a look at three of the winning designs, turn the page.
Three winning designs, and why they won

These buildings won top honors in the Owens-Corning Energy Conservation Awards Program for 1976. Look them over. They show how new and not-so-new thinking can produce outstanding energy-saving designs. For more information about all the 1976 winners, write to K.T. Meeks, Owens-Corning Fiberglas Corporation, Fiberglas Tower, Toledo, Ohio 43659.

Printing House, New York City. Recycles an obsolete industrial building to create unique urban style housing. A vertical heat pump provides heating and cooling. Solar panels provide energy for domestic hot water. All insulation standards are upgraded. All windows are ⅝-inch insulating glass.
Federal Office Building, Topeka, Kansas. Uses mass plus heavy insulation in walls and roof to create an energy-conserving envelope. Open, skylighted interior atrium allows minimum exterior glazing. Windows comprise only 17% of exterior wall area. Glazing is recessed or shaded to reduce heat gain in summer. Lighting is 2.3 watts/sq. ft. Estimated saving on heating costs: $2,600/year.

Fremont Elementary School, Santa Ana, California. Poured-in-place concrete construction stores heat in the structure, causes a lag in heat transfer to occupied spaces. Subsurface design and earthen berms reduce heat gain and loss through walls. Total cooling load is cut 20%, electrical consumption is cut by 42.5 kw/hr for annual savings of $2,142.
Antron® II nylon. The nylon known for its lasting...
upont carpet fiber

good looks. At A.T.&T.

ew A.T.&T. Administration Building,
ning Ridge, New Jersey.

arpet-all 150,000 square yards- is a special
construction with pile of Antron® II nylon.
on” II was selected for its outstanding
term appearance-retention qualities.

How “Antron” II masks soil. Here in this 250X
electron micrograph, you can see the remark-
able four-hole fibers of “Antron” II. The four
microscopic voids scatter light to mask soil and help
blend soil concentrations into the overall carpet look.
The smooth exterior shape minimizes soil entrapments,
making cleaning more
effective than irregularly
shaped fibers.

“Antron” III nylon for durable, effective static
control is available in most styles in “Antron” II.

Specifier's Information Kit. For more information—a
carpet manufacturers’ resource list, a specification guide
for commercial office buildings, and a maintenance man-
ual—write: Du Pont Contract Carpet Fibers, Centre Road
Building, Room AR, Wilmington, DE 19898.

*Du Pont registered trademark. Du Pont makes fibers, not carpets.
Cookson Rolling Grilles. The best way to close an opening.

Specified nationwide by architects who demand dependability, superior craftsmanship and outstanding performance. For information on our custom-engineered rolling door grilles and counter doors, consult our catalog in Sweet's (8.7/Co) or send for your own copy. The Cookson Company, 700 Pennsylvania Avenue, San Francisco, CA 9410
Reflectee
an attractive, low cost alternative to surface mounted fluorescent strip fixtures.

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Markable savings of $972,024!

It's it. architect Paul Slusarev, Manager of the massive new Penney warehouse/office in Kansas, is helping to point way for designers of schools, stores, and other commercial buildings everywhere.

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For more data, circle 21 on inquiry card

Get the whole story, write:
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Why NuTone SecuriCom®?
You probably already know the answer... crime is rising and unprotected buildings are experiencing occupancy problems. With NuTone's SecuriCom, you can offer apartment owners maximum protection and flexibility at a very attractive price.

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If you were impressed with SecuriCom's ease of installation, its operation will absolutely amaze you. Visitors simply pick up a telephone handset from the lobby directory, and press a single button which rings the tenant's regular telephone. After tenant identifies the visitor, he or she simply dials "6" to activate the door release... that's all there is to it!

SecuriCom® offers All the features you want:
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• Automatic door re-locking
• Excellent fidelity for easy recognition
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• Modular Pushbutton Panel in five sizes to fit number of units in your building
• Postal Lock provision
• Adaptability to any type of building

For the name of your nearest NuTone SecuriCom Representative, DIAL FREE 800-543-8687 in the continental U.S. Ohio residents call 800-582-2030. In Canada, write NuTone Electrical, Limited, 2 St. Lawrence Avenue, Toronto M8Z 5T8.
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Year-end figures showed total construction activity in 1976 up 16 per cent from 1975, for a record $107.2 billion, according to the F.W. Dodge Division of McGraw-Hill Information Systems Company. "Since inflation in construction has subsided over the past year," observed Dodge economist George A. Christie, "the 1976 advance of 16 per cent in total construction contract value meant a solid 10 per cent improvement in 'real' volume." But, he added, "the recovery of construction still has a long way to go." Residential building in 1976 was up 40 per cent from 1975, and nonbuilding construction, largely because of energy projects, was up 12 per cent. Nonresidential building, however, though it showed considerable improvement as the year progressed, was off 5 per cent.

Recent changes in tax law threaten to dampen American enthusiasm for design work abroad by disallowing exemptions for overseas earnings. At the same time, IRS has begun to scrutinize employee benefits. Details on page 41.

DOT will study the services architecture and the other arts can offer in the design of transportation systems. The establishment of this task force was one of the last acts of outgoing Transportation Secretary William T. Coleman, Jr. Details on page 38.

AIA has named sculptors Louise Nevelson and Claes Oldenburg recipients of its 1977 Medal "for artistic achievement related to architecture." Other Medalists named by the Institute include Arthur Drexler, Director of the Department of Architecture and Design at the Museum of Modern Art, and the Federal government's Historic American Buildings Survey, for "significant achievement in recording architectural accomplishments." G. Holmes Perkins, FAIA, former dean of the Graduate School of Fine Arts at the University of Pennsylvania, and Barbara Ward, economist and moving force behind the United Nation's HABITAT, will receive medals in recognition of their "achievements in inspiring and influencing the architectural profession."

The National Trust for Historic Preservation has bought a National Historic Landmark for its headquarters. Architects David N. Yerkes & Associates will adapt the Mellon Apartments in Washington, D.C. Details on page 39.

The National Park Service has designated Philadelphia's PSFS Building a National Historic Landmark. According to the designation, the building, designed by George Howe and William Lescaze, "has not aged nor become old-fashioned. PSFS was a great structure from the time of its first conception because the bank was willing to permit the best and it hired a fine architect who had the opportunity, rare in any architect's career, to do his very best."

The American Academy in Rome has appointed Bill N. Lacy its new president. For the last five years, Mr. Lacy has been director of Architecture and Design for the National Endowment of the Arts, and earlier was Dean of Architecture and Fine Arts at the University of Tennessee and at Rice University.

A major exhibit, "Women in American Architecture," opened February 23 at the Brooklyn Museum. The collection of photographs, drawings and models, which spans more than 200 years of examples, will also be seen at MIT and at Colorado Springs. Details on page 38.

The National Solar Heating and Cooling Information Center has begun operations as a clearinghouse for data on design and equipment for solar-energy collection. The center was established by the Department of Housing and Urban Development and the Energy Research and Development Administration. Mail requests for information should be sent to Solar Heating, P.O. Box 1607, Rockville, Maryland 20850, and telephone calls may be made to 800/523-2929 (in Pennsylvania, 800/462-4983).

A series of seminars on the management of architectural and consulting engineering firms will be conducted this spring by the Professional Services Management Journal. The title of the day-long seminars include "Motivation and Compensation of Professional Employees," "Marketing to Public Agencies," and "Negotiating with Public Agencies." The series is scheduled for April 13-15 in New Orleans, April 25-27 in Denver and May 2-4 in Newark. Contact: Michael Hough, PSMJ Editor-Publisher, P.O. Box 11316, Newington, Connecticut 06111.

The 1977 Shinkenchiku Residential Design Competition has as its theme "Comfort in the Metropolis." Architect Peter Cook is judge of the competition, which will award more than $3,000 in prizes. For information: Shinkenchiku-sha Co., Ltd., Attention: Editorial Section of The Japan Architect, 31-2, Yushima 2-chome, Bunkyoku-ku, Tokyo 113.

The Iranian government has announced an international design competition for the Pahlavi National Library, to be built in Shahesastan Pahlavi, the future city center of Tehran. First prize will be $50,000 and the commission. Second and third prizes are $25,000 each, and ten additional prizes of $10,000 each will also be awarded. Registrations are due by April 19. Documents are available for $30 from Pahlavi National Library Project, Committee for the International Competition, Aryamehr Square, 9 Bisuton Avenue, Tehran.
DOT seeks to integrate architecture and transport

A task force has been established to look for ways of ensuring that better architecture, art and design are incorporated into Federally funded transportation systems.

Within six months, the task force is supposed to develop a plan to guarantee that all public funds allocated to transportation be spent with “due consideration for their design, artistic and cultural impact.”

Former Transportation Secretary William T. Coleman, Jr., established the task force before he left office. Delegates and officials expect the new Transportation chief, Brock Adams, to consider the task force’s recommendations.

Mr. Coleman’s instructions to the task force were to consider the creation of a National Advisory Board of Design, Art and Architecture in Transportation (NABDAAT). He also wanted the panel to look into ways of financing the architectural enhancement of transportation systems, at the same time pointing out that Federal grants are available to communities for the esthetic environmental enhancement of transportation facilities.

“As a matter of policy,” Mr. Coleman said, “we believe that a concern for good design is an integral part of responsibility planning for safe, efficient and economical transportation systems.” He added, “High-quality design will accomplish the broadest transportation objectives and may generate benefits which far outweigh any additional costs.” Therefore, he said, emphasis must be placed on the choice of plans “which embody the finest American architectural, design, and artistic thought.”—William Hickman, World News, Washington.

White paper calls New Town program “poorly designed”

The Federal New Town program launched by the Democrats in Congress in 1968 was “poorly designed and never given the support it needed” during the eight years of the Nixon and Ford Administrations, in the judgment of a white paper produced by New Communities Administrator James A. Dauchand and handed to Patricia Roberts Harris.

The 100-page white paper, supported by three appendices, concludes that the New Town program—backed by nearly $300 million in bond guarantees and another $144 million in grants and other commitments—was doomed to failure from the start.

The report took several months to prepare and cost $270,000, including a $244,826 report from management consultants Booz, Allen & Hamilton titled “An Assessment of Past Problems and Alternatives for Future Actions.”

The major flaw, according to the report, was that the program overloaded the projects with monthly bond interest costs that soaked up, for many of the 13 developers, several times the annual cash flow they were able to generate by lot sales to homebuilders.

The report, recommends that in future states and localities assume the initiative and responsibility for any government-backed New Towns. The federal role should be limited to that of catalyst and provider of grants, the report suggests.

While the housing depression dealt a severe blow to the New Town projects, Mr. Dauch and concluded that “most of the projects . . . would have encountered serious financial difficulties [which] would have occurred in any event.” The white paper points out that HUD required “unrealistically low cash equity investments” by developers; that “land speculation, based on a developer’s existing landholdings, dictated site selection”; that HUD staff “accepted unrealistic projections of [the developers’] potential rate of lot sales; and that “few experienced large-scale developers were willing to undertake” a Federal New Town project.

Citing the effects of the heavy debt burden on developers, the white paper gave some illustrations, such as Flower Mound, near Dallas, which paid for 27 per cent of its land when less than one per cent of its projected revenues had been received, and Park Forest South, near Chicago, where land purchases of $18.9 million exceeded projected costs by 89 per cent, while the $4.5 million in sales revenues through May 1974 was 38 per cent lower than projected.

According to the report, the HUD staff “accepted the untested hypothesis that a new community was a unique product that would receive an unusually high degree of buyer acceptance”—leading to the uncritical belief that Flower Mound, for example, would capture more of its market than was achieved by successful privately financed new towns like Columbia, Reston and Irvine.

The report says that “most Title VII developers were entrepreneurs in other business, including, e.g., shopping center development and oil and natural gas production, who were local civic and religious leaders. In a few cases, such as Riverton, Park Forest South and Shenandoah, the development entity was owned by an experienced large-scale developer—e.g., Robert Simon (Riverton), who had begun Reston, Nathan Malmiy (Park Forest South), who had developed Park Forest, and Scott Hudgens (Shenandoah), a major large-scale Georgia builder.

“However, the operational staff of the development entities, like the HUD New Communities staff, was thin or altogether lacking in such experience,” the report added. “For example, in St. Charles did the owner and key development staff have team experience in the complexities of large-scale or community-scale development.”—Donald Loomis, World News, Washington.

HEW rejects Congressional rules for architectural barriers

A regulatory package to end “discrimination” against the handicapped and remove architectural barriers that hamper their access to schools, hospitals and other public institutions is bouncing back and forth between Congress and the Department of Health, Education and Welfare for want of a signature giving it the force of law.

HEW formulated the regulations, called for by the 1973 Rehabilitation Act, but HEW Secretary David Mathews refused to sign them before leaving office with the rest of the Ford Administration. Indeed, he ignored a Federal court order to sign the regulations and narrowly escaped a contempt citation for that refusal.

Mr. Mathews maintained that more (and more expensive) could be accomplished from Congress on such issues as discrimination against drug addicts and alcoholics, and asked Congress for its opinion on these questions.

A spokesman for Mr. Mathews’ successor, Joseph A. Califano, Jr., said the new secretary has not had time to study the issue or to determine whether the regulations should be signed.

One of the major provisions of the package calls for the removal of barriers that hamper access by the handicapped to buildings operated by schools, health agencies or any other institution that receive Federal funds. That regulation, opponents say, could cost affected institutions millions of dollars to renovate or remodel buildings and other barriers.

Secretary Mathews sent the regulations to Sen. Harrison A. Williams, Jr. (D-N.J.), chairman of the Senate Labor and Public Welfare Committee, asking him to clarify whether Congress intended the bill to be as far-reaching as the HEW regulations call for. If the regulations will now bounce back to Secretary Califano after Congress review.—Michael Mealey, World News, Washington.

Major exhibition on women in architecture opens at Brooklyn Museum

An idea of the Architectural League of New York and its Archive of Women in Architecture, and two and a half years of research and design by architect Susana Torre has culminated in the exhibit “Women in American Architecture.” The show, which opened February 23 at the Brooklyn Museum, was funded by the National Endowment of the Arts and the New York State Council for the Arts, as well as by contributions from a number of corporations and foundations.

In addition to examining the work of academically trained architects, the exhibit will encompass women’s other contributions to the built environment, as designers and theorists of domestic space, as creators of “symbolic spatialities,” and as architectural critics.

The exhibition includes about 100 boards, as well as architectural drawings and models. In time, exhibition-goers will be able to share their views on women in architecture through a feedback mechanism.

The exhibition will remain at the Brooklyn Museum until April 15, after which it will travel to the Museum of Modern Art, New York; the University of Chicago, Chicago; and the University of California, Los Angeles.

The show will include examples of architecture by women from the 19th century to the present, including the works of women who have been designing in this field for decades, such as Frank Lloyd Wright, who designed the Imperial Hotel in Tokyo, and Julia Morgan, who designed the Hearst Castle in San Simeon, California.

The exhibition will also feature the work of women who have been designing in this field for decades, such as Ise Sekisui, who designed the Imperial Hotel in Tokyo, and Julia Morgan, who designed the Hearst Castle in San Simeon, California.

The exhibition will also feature the work of women who have been designing in this field for decades, such as Ise Sekisui, who designed the Imperial Hotel in Tokyo, and Julia Morgan, who designed the Hearst Castle in San Simeon, California.
Regional Trust will recycle national landmark

National Trust for Historic Preservation, practicing what it preaches, acquired a National Historic Landmark for adaptive reuse as its national quarters in Washington, D.C.

The five-story Beaux Arts building, which was completed in 1917, designed by architect J.H. DeShayes for luxury apartments, with one tenant per floor (see RECORD, April 1977, page 36) has now been turned over to 22 cities, where workmen reconstruction unions have some willingness to take a cut in pay. Carla Hills approved the plan before she left office as Secretary of Housing and Urban Development.

The success of the $150-million program, involving the rehabilitating of 800 housing units, hinges upon the building trade unions in the cities of the country. The Los Angeles Times has softened its approach and voted to emphasize rehabilitation in dealing with an estimated 14,000 unrefined masonry structures that are considered potential earthquake hazards.

In approving a new seismic safety program, the Council disregarded a proposed ordinance that would have required the owner of a structure determined unsafe (except single-family residences) to post a warning sign of earthquake hazard until the building was brought up to code, or demolished. The deadline for such posting or demolition would have been January 1, 1987.

Instead, the new Council plan calls for unreinforced buildings to be identified and cataloged, a special study made to develop an ordinance detailing how they can be improved to meet minimum safety standards, and preparation of an environmental impact report.

The city also will seek financial assistance from the Federal government, along the lines of rehabilitating buildings prior to a disaster rather than after the fact. And it will sponsor legislation to provide long-term, low-interest loans for repairs.

The 14,000 structures—mostly in the central downtown area—were built before 1933, when the Long Beach earthquake occurred. After the quake, new seismic codes were developed to increase structural safety.

Numerous structures are about 30 public assembly buildings, including restaurants, theaters and churches, as well as commercial structures and residences. While no dollar figure is available for bringing the buildings up to code, the city's Department of Building and Safety estimates it would run about 80 percent of what new ones would cost.

For years, organizations such as the Southern California Structural Engineers Association, the Southern California Chapter of the American Institute of Architects, the Los Angeles Section of the American Society of Civil Engineers, and the Earthquake Engineering Research Institute have called for legislation that would require rehabilitation or demolition of the pre-1933 buildings which do not meet modern lateral force requirements.

According to Councilman David Cunningham, chairman of the Council's Building and Safety Committee, which recommended the new approach, the committee fully recognizes the magnitude of the problem that could result from collapse of 14,000 structures. However, Cunningham says, it believes a balance should be maintained between concern for public safety and the economic survival of a segment of the public—Barbara Lamb, World News, Los Angeles.

Assault on Transamerica peak fails on lower slopes

On January 30, alpinists Edwin Drummond and Jeff Long made the first recorded attempt on the north face of San Francisco's Transamerica Pyramid. The ascent failed at the seventh floor, where the fire department turned the climbers back at the end of a six-hour effort. Although a window was removed to allow the mountaineers to enter the building and return by elevator, they rejected this rescue and made their descent conventionally.

Interviewed later by television newsmen, the climbers said they had been moved to the attempt by the technical difficulties presented by the slope—as challenging as some of the better known faces at Yosemite—and by its unusual urban setting. The climb was intended as an exploratory effort toward a more ambitious assault by Drummond, Long and Mrs. Drummond; a two-day ascent of the tower during which the three would converse with office workers.

Though permission for the climb had not been granted, neither Transamerica nor the authorities plan to press charges; fire officials remarked that the climbers were clearly expert.

Drummond and Long are seen here at their first base camp.
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in their business slumps, may not
panacea for the profession after
he reason: tax law changes last
are effectively undercutting
ican firms and bettering the com-
ve chances of architects from
se and Europe.
There is hope that Congress will
the damage with a new law this
If it does not, American firms will
asily find that they cannot meet
ices for design work set by less
bered overseas operators from
countries.
The tax law change in question
much of a tax exemption
enjoyed by Americans employed
ad. The law increases the amount
patriate income that is subject to
axes, and employers find that
make up the difference in
home pay—a substantial amount
must be counted as overhead.
To make matters worse, Congress
ve the change retroactive and
by-sold many individuals with
pected tax bills. At the same time,
ternal Revenue Service started
rinking cranky about some of its regu-
us, too. Specifically, IRS started
ring further into employee “ben-
ackages.” It seems likely that IRS
will consider the costs of home-leave
, educational allowances, shelter,
and health care as income sub-
to taxation. A number of court-
s are pending.
Organizations of construction de-
ers and contractors are working to
convince Congress that the law
be changed. IRS should let
them know that the lawmakers that
ation benefits in many ways from
icans working on construction
its abroad. American designers
lead to American contractors,
ican materials and American
ment, they argue.
This message may be getting
h. Sens. Abraham A. Ribicoff
n.) and Robert P. Griffin (R-
.) have instructed their staffs to
k with construction industry trade
ps with an eye toward introducing
ation to return the law to its old
age.—William Hickman, World
s, Washington.

Georgia AIA loses challenge
to state registration laws

Georgia Supreme Court has re-
d the contention of the state chap-
ol American Institute of Architects
 the design and supervision of the
struction of a fire station by a regis-
ted engineer employed by Gwinnett
ity constituted unlawful practice
architecture.
Although the judges concurred
r “may not freely practice
architecture,” they also agreed that the
 Georgia code, which defines “engi-
” and “architect” in broad terms,
eds to be more definitive. The
judges felt, however, that such de-
nition must come from the Legislature,
where the AIA now will seek redress.
The question arose last summer
when Gwinnett County began the
construction of its 11,000-sq-ft fire
station headquarters. The AIA filed
for a permanent injunction against
the county because it claimed the
drawings for the $189,000 structure
did not have the stamped approval of a regis-
tered architect. After the
were stamped, the AIA ques-
tioned the registration laws. John A.
Busby, Jr., of the architectural firm,
ova Daniels Busby, and president-
elect of the Georgia chapter, AIA, says,
“it’s a test case. The broad interpre-
tation of the registration law now in
Georgia does permit architects and
engineers to practice.
Gwinnett County Fire Chief Ray
Mattison explains that in designing the
county’s fire stations, he and other fire
department officials customarily draw
a rough sketch of the proposed build-
ing, present it to a fire prevention
inspector (also a draftsman) who pol-
ishes it, and hand it over to the county
architect, M.J. Seeley. Mr. Seeley
registered engineer in Georgia, re-
draws the plans, writes specifications
and supervises construction. County
officials estimate that this practice has
saved the taxpayers about $50,000 on
the fire station headquarters because
persons already on the payroll helped
design the building.
The Georgia AIA, according to a
spokesman, “has run its course in the
courts” and now plans to present a bill
to the Georgia Legislature next year.
It hopes to have the approval and sup-
port of engineers, architects and regis-
tration boards in the state.—Brenda
Lloyd, World News, Atlanta.

NCIC lifts ban on labor issues
to lobby against situs picketing

Construction’s “single voice” group—
the National Construction Industry
Council—now has the authority of
its members to take positions on labor
legislation issues.
Hereafter, the Council banned
labor deliberations on issues in the
interest of preserving solidarity—both
union and non-union contractor
groups participate in NCIC affairs.
The ban was lifted, however, because
all members oppose common-situs pick-
eting legislation that is being pushed
in Congress by organized labor.
Immediately after repealing the
ban, the Council voted unanimously
to go on record as opposing situs legis-
lation, and authorized its legislative
committee to contact lawmakers to
urge defeat of any situs-picketing bill.
Under the Council’s new rules, a
specific labor issue must have the con-
currence of 90 per cent of the Council
members present and voting before a
position can be considered. Positions
on non-labor legislative issues can be
taken with 75 per cent concur-
cence.—William Hickman, World

Nigeria’s Court of Appeals will have six regional centers

The present government of Nigeria, a
military regime led by Lt. Gen. Oluse-
gun Obasanjo, has promised to return
the country to civilian rule by 1979 and
drafted a new constitution to
end. A major aspect of the constitution is
the establishment of a Federal judi-
cial system, of which the most
important part is the introduction of machin-
ery for judicial appeals.
At present, Nigerian law, which is
modeled on English law, is adminis-
tered by local civil and criminal courts
from whose judgments there is no ap-
peal. The government has named Dan
Ibekeke, a former Attorney General,
president of the new system of Federal
Courts of Appeal, and has also
appointed 12 appellate judges.
At the same time, architects P.I.
Nwamu Associates, a firm practicing in
both Nigeria and the United States,
and Litchfield Grosfeld Associates of New
York City have been commissioned to
develop designs for a network of six
regional appellate court centers.
Although the buildings will vary
slightly in exterior appearance and or-
ament—the northern districts of the
country are strongly influenced by
Moslem culture—they will otherwise
be Virtually identical (see above),
each containing about 33,000 sq ft of air-
conditioned space.
The structural system will be
poured-in-place concrete, with a bar-
el-vault roof for large spans in the
court rooms and public areas. Exterior
walls, in contrast to the exposed
concrete superstructure, will be white marble.
Large expanses of glass wall will be
set back of the building line to pro-
vide shade and a reduction in air condi-
tioning load. Buildings will face en-
trance courtyards, with fountains and
formal landscaping.
Because appellate courts are a
new building type in Nigeria, the de-
signers have emphasized interior flexi-
bility, with such devices as demount-
able partitions, so that the plan can
be adapted as the users better understand
their space requirements.
In another area of legal adminis-
tration, the government has moved to
improve the conditions of legal training
by providing housing at the Nigerian
Law School in Lagos. Because there is
no undergraduate law school in the
country, Nigerian attorneys take their
law degrees abroad—mostly in Great
Britain—and return to Lagos for a year’s
study of Nigerian law before being
admitted to the bar.
There is at present no student
housing on campus, and N.B. Graham-
Douglas, Chairman of the Council of
Legal Education, has commissioned
P.I. Nwamu and Litchfield Grosfeld
to design a group of six hostels (see
below). The buildings will contain 432
single rooms arranged in pairs to share
a common bathroom.
The buildings will be oriented to
catch the prevailing winds from the ad-
cient bay. Each room will be cross-
ventilated, and will face the bay
through louvered window walls
shaded by brise-soleil. Four-story
lounges are located strategically at
building ends, and the six hotels are
connected by bridges to allow shel-
tered passage between units. The com-
plex will also include a centralized Stu-
dent Union building. The concrete
structure will be enclosed by concrete
block and brightly colored local ce-
namic tile.
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Burpee design a crystal cathedral for California

Today, the Rev. Robert of Garden Grove, Cali-nducts five services for gation seated in the-ity Church and parked ve-in sanctuary; one services is broadcast on television as "The Power." Because the-as 8,000 members in Grove, while its build-ing seats only 1,700, Mr. Schuller has commissioned Johnson/Burpee Architects to design a new cathedral. The fac-eted building—the star-shaped plan has eight sides, each set at a different angle, and the roof has three different slopes—will be supported by a steel-pipe space truss. The entire building envelope, including the roof, will be glass. The sanctuary, with 25,000-30,000 sq ft, will accommodate 4,000 worshippers on the ground floor and on concrete balconies. The pl-per provides a parking area at the back of the church for the drive-in congregation. Near the pul-pit, a door will allow Mr. Schuller access to a balcony overlooking the parking area.

Nathan site a synagogue along a wooded ridge near Memphis

es of Temple Israel in Memphis will enter their new edictary via a glass-covered atrium and a skylit gallery. In addition to the 1,336-seat semi-sanctuary, the temple's facilities include a 250-seat multipurpose social center, library, offices, classrooms. Behind the sanctuary is a patio shelters the temple's library and an amphitheater. Its Gassner/Nathan & Associates designed the structure on the 30-acre site to blend as much as possible into the attractive contours and an impressive stand of oaks, hickorywoods and magnolias. Goo-mdaniel Goodman served as consulting architect.
The gap between knowledge and documentation had to be closed.

And building designers and others had to be provided with a way to easily use the new proof.

Not easy tasks. But critical ones in an era when the energy performance of buildings is a matter of the highest priority.

For thousands of years people have known that buildings with masonry walls were more easily kept warm in winter and remained cooler in the summer. The reason was obvious: masonry walls both stored and slowed down the passage of heat, making interior climates more stable. A simple, observable fact. But no longer sufficient.

Designers and owners needed to know how much better masonry conserved energy than did competitive materials and systems. And they needed a simple way to calculate the differential.

Only then could masonry’s superior thermal performance be reliably taken into account in meeting energy conservation goals and requirements. Only then could heating-cooling equipment be more accurately sized to save money on both initial and operating costs.

Disdaining “claims” without documentation, the masonry industry began a broad research project to quantify the relationship of the mass or weight of masonry walls to the transmission of energy. The masonry industry engaged a highly qualified firm of consulting engineers (Hankins & Anderson, Inc.) to conduct the study. Ten different walls ranging in weight or mass from four pounds (19.5 kg/m²) to 116 pounds (567.5 kg/m²) per square foot were specified for analysis in 10 widely varying climatic conditions. And in eight solar orientations.

Researchers used a special computer program built around the “response factor” method adopted by the National Bureau of Standards Load Program along with other computer programs. They analyzed U.S. Weather Bureau data and considered the effects of many variables, including the weight of walls, on thermal performance. Results of the computer analysis showed:

- Traditional “U” value measurements of the thermal performance of walls are inadequate. They are based on the incorrect assumption that energy transmission occurs in a “steady state.” Contrarily, the process is dynamic and varies greatly in relation to many factors, one being the weight of walls.
- Steady-state “U” value measurements therefore may often result in the over-sizing of heating equipment for buildings with masonry walls (and the undersizing of such equipment for buildings with lightweight walls).
- The difference between steady-state and dynamic measurements can be accounted for by the use of a correction factor—the “M” factor—in making heat gain and loss calculations.

The consulting engineers’ report and data consisted of 460,800 numbers on 1,200 pages of computer print-out. Important as this proof of the superior thermal performance of masonry walls was, it was not enough.

The task of developing a tool for the easy use of the findings remained. Masonry industry engineers began studying and correlating the data to provide a simple correction factor for dynamic analysis.

The result: An easy-to-use “M” factor graph or curve.

Only two numbers are required in order to use the graph: the number of “degree days” in the locale (obtainable from the U.S. Weather Bureau) and the weight per square foot of the wall. The graph can then indicate the appropriate “M” factor modifier, or correction factor, to be applied to steady-state “U” value measurements. A more accurate measurement of the dynamic thermal performance of walls results.

The graph shows that in all cases, masonry walls perform better than lighter weight walls with the same “U” value rating. The heavier the wall, the greater the differential.

Results of the masonry industry study and the “M” factor graph have been submitted to the Conference of American Building Officials (CABO). And CABO has agreed that the effect of mass should be considered in making heat gain/loss calculations.

The “M” factor study findings are contained in a new Masonry Industry Committee publication, Mass, Masonry, Energy. With the findings are graphs and charts, and an explanation of how to use them. An all-in-one booklet—everything you need to know in order to take advantage of the superior thermal performance of masonry walls.

We’re proud of the new proof that masonry walls save more energy than walls of competitive materials with the same “U” values.

We’re proud of the fact that the masonry industry decided to produce this proof, rather than simply make a claim.

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In addition, citations went to Jean W. Fraley/Associates for Bloch’s Restaurant in Seattle, to Wright Gildow Hartman & Teegarden for Pacific Northwest Bell communications building in Spokane, and to Hobbs/Fukui Associates for the Hobbs residence in Seattle. The chapter gave special commendation to the city’s Department of Community Development for its “Bhy Krackle Gift Program” designed to encourage citizens to make “functional and attractive gifts” to the city. Jurors were Ken Brooks, FAIA, of Brooks, Hensley and Creeger, Spokane, Washington; James Harris, AIA, of Harris, Reed and Litzenberger, Tacoma, Washington; and Robert Frasca, AIA, of the firm Wolff, Zimmer, Gunsul, Frasca, Portland, Oregon.
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"We have chosen not to cut the top of the buildings off in the usual fashion against the sky, but rather to silhouette a counterpoint of strong diagonal massing."
—Philip Johnson, Architect.

(1) The use of stub-girders enables the air-conditioning ducts to be carried through the built-up girder system without requiring any web penetrations. The stub-sections act compositely with the 3-1/4-in.-deep concrete topping placed over the galvanized steel floor deck.

Each trapezoidal tower measures 120 ft wide, a maximum of 250 ft on the long side, and 130 ft on the short parallel side. The fourth side is angled 45 degrees to the parallel sides.

(2) An eight-story, glass-endlosed courtyard connects the towers at their base. The see-through enclosure provides continuity of design, as well as an airy, visual experience for persons entering the building.
Pennzoil Place, designed by Johnson/Burgee and S. I. Morris, adds a bold, new architectural dimension to the Houston skyline. Rising 516 ft above grade, the twin, 37-story zoidal towers of Pennzoil Place contain a total of 1.8 million sq ft, making it the city's largest office complex. A retail and a three-level garage are located below the plaza level.

Speeds construction. The project's building program was completed on a 24-month construction schedule. Several structural systems were considered during the early design phase, but steel was selected because of its ability to be erected more rapidly.

The stub-girder concept resembles a Vierendeel truss system. The composite concrete and steel floor deck system forms the top compression chord of the Vierendeel and a high-strength steel section forms the bottom tension chord. Stub pieces, shop-welded to the bottom tension chord and connected to the composite concrete and steel floor deck system by welded stub-type shear connectors, serve as the verticals of the Vierendeel.

The unusual floor-framing system enables the air-conditioning ducts to be carried through the built-up girders without requiring any web penetrations. This increases the structural depth of the girder without adding a penalty for increased height. Result: significant economies in structural steel. It's estimated that stub-girders reduce structural steel quantities by approximately 2.5 lb per sq ft compared to conventional framing systems.

And because building height is reduced, savings result in other construction items, such as curtain walls, elevator ropes, and electrical and mechanical equipment.

What's more, because the continuous floor beams can be easily positioned atop the girders, erection proceeds more rapidly than usual.

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Find out about all the natural advantages and beauty of Caribbean today. Write to American Olean Tile Company, 2400 Cannon Avenue, Lansdale, Pa. 19446 for a free brochure. Caribbean Ceramic Tile. It's the natural thing to use.
In the penultimate draft of the 13th edition of AIA, the American Institute of Architects has been intimately involved in the publication of standard contract documents for architects and others in the construction process. The structural spine of this documents program is the most widely used standard contract in the construction industry—the AIA General Conditions of the Contract for Construction (commonly known as document A201). The importance of this single document is evidenced by the hundreds of thousands of copies distributed annually by AIA.

In late 1976, AIA issued the 13th edition of its General Conditions. The new version contains as revisions and changes developed during the six-year interval since publication of its predecessor. While there are relatively few major differences of substance between the 12th and 13th editions, a step-by-step review reveals that the new document contains numerous technical improvements that better organize and clarify the relationships, rights, responsibilities and duties of parties involved in construction projects. This is first of two articles on the major modifications made to the A201 document.

On the definition of contract documents...

In Article 1, a technical change was made to Subp. 1.1.1 containing the definition of contract documents. Previously, only those items that were contract documents by definition were enumerated. Now, certain items such as the bidding documents are specifically excluded from the definition of the contract documents. This approach should eliminate confusion about the status of all documents so listed. Documents not listed as either being included or excluded from the Contract Documents are covered by the catch-all phrase "or any other documents" appended to the list of excluded documents. Therefore, any item such as the shop drawings—not designated a contract document is not, by definition, to be considered a Contract Document.

Para. 1.3, which relates to the architect's ownership of the documents, has been improved considerably. Language has been added to protect the architect's common law copyright in the documents he prepares when they must be submitted to regulatory authorities in the course of securing approvals for the project. The case law had been divided on this particular issue, and the inclusion of this new contract language will be helpful in preventing unauthorized use of the documents.

On the architect's role during construction...

In Article 2 relating to the architect's role during the construction phase, a minor semantic change was made in Subp. 2.2.3. Rather than being required to make "periodic" visits to the site as before, the architect now must visit "at intervals appropriate to the stage of construction." The impetus for this change was nothing more than a recognition that the common dictionary definition of "periodic" could be interpreted to mean visits at regular intervals. In accordance with normal practice, most architects visit the site whenever they feel it is necessary, in their professional judgment, to perform their required duties, rather than on some arbitrarily set schedule as would be imposed by a literal interpretation of "periodic." Thus, this change simply brings the written contract into conformance with customary practice and does not lessen in any way the architect's responsibility.

Subp. 2.2.4 has been singled out by some as an abrogation of the architect's responsibility because it states that he is not responsible for construction means, methods, techniques, sequences or procedures, and so forth. In line with the philosophy that the architect designs and the contractor builds, this provision, which has appeared in almost identical form in numerous prior editions, merely sets forth a contractual recognition by the owner and contractor that the architect is not responsible for the contractor's functions.

Subp. 2.2.12 relates to the architect's duty to render a decision when claims or disputes are submitted to him by either the owner or the contractor. This provision has been modified as a result of a couple of recent court decisions to make it clear that any decision by the architect must be in writing, and it must state that it is final but subject to appeal and that arbitration must be demanded within 30 days. Unless the architect conforms to these requirements, the owner or contractor may not be barred from demanding arbitration more than 30 days after the architect renders his decision.

On the owner's obligations...

Article 3 relating to the owner contains two major changes—one beneficial and one highly dubious. The questionable change appears in Subp. 3.2.1, a brand new provision that requires the owner to give the contractor "reasonable evidence" of his financial arrangements for the project. Failure by the owner to provide this evidence will excuse the contractor from entering into the contract. While it may seem reasonable for contractors to want financial assurances, there is considerable doubt about the willingness of owners to voluntarily proffer this information as a condition of the contract. This new provision has not continued on page 57.

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rafted as a condition precedent, so there if anyone has a problem with that part of
the contract, he must act promptly. If the contractor must file a
suit, he can only do so if the owner's financial information is reliable.

In order to avoid a court proceeding, the owner's financial information
must be reliable. If it is, the contractor can act promptly and
promptly file a suit.

The new language in Subp. 3.3.1 makes it clear that the owner himself
must personally sign the order, or must give specific written power
to an agent to do so. In order to take the drastic step of stopping the work.
Again, this provision further clarifies an important change made six
years ago so that the proper roles of the owner and architect will be clearly
understood. In no way, however, is the architect's power
diminished to reject work that does not conform to the drawings and specifications.

Next month, the second part of this two
part article will discuss changes in the remaining
11 articles of A201.

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nning your personal financial strategy

ark Pollard

Interviewing a number of architects around the country, the author learned—not unexpectedly—that their paramount personal financial concern is to become more financially independent. In addition, younger architects often cannot initially afford to take the risks associated with common stocks. This article—the first of two on personal investment—is one of a series of counselor’s opinions on how a hypothetical architect could begin amassing the capital required to take the bigger step into sophisticated investment programs. The strategy: a combination of conservative investments that will allow capital growth at a greater rate—within the limits of risk—than if the architect had all of his discretionary income in a savings account. Next week, we will examine the investment programs available to the senior architect who has already earned his capital and is saving on a regular basis.

Cooper (our hypothetical subject) is a 40-year-old architect who is married and has two children. Like most architects, Andy’s chief concern is to become more financially independent. In this respect, he is certain about things: 1) He wants to add to his current savings, and 2) he wants to maximize the return on the $15,000 he recently inherited.

First, let’s look at his current situation. In 1976 Andy and Linda earned $31,000. The major source of income, $26,000, comes from a position of eight-person firm, re he has a small interest (3 percent) in. A earns $5,000 per year.

The Coopers don’t know why, but despite their substantial income, they cannot seem “to save.” Fortunately, they are able to meet their fixed obligations, including mortgage payments and insurance premiums as well as a small life-insurance policy of $35,000. However, after the Cooper’s pay their current expenses, what they think of as “savings” (the remaining income of $100-150 a month) is not going into a savings account.

L, open a savings account

The first problem for Andy and Linda is to solve their inability to save money on a regular basis. The solution to their problem is to learn discipline of an organized investment program. By organized, I mean the saving of a sum on a monthly basis. Should Andy and Linda begin saving $100 per month in a savings account at 5 percent interest rate compounded daily, they will have put aside approximately $231,500 in the first year alone, and will have $1,881 at the end of 10 years. Table I shows the amount they are able to save over a period of 10 and 20 years.

An extension of the savings principle is an individual retirement account (IRA) for both Andy and Linda. Fortunately, Linda has an IRA account in her local savings and loan where she initially deposited $500 at the end of 1976. Since a contribution of up to 15 percent of your earned income (to a maximum of $1,500) is allowed in an IRA, Linda could have contributed $750 to her program. One of the major advantages of an IRA is that the taxes on any interest or gains accumulated through the IRA are deferred until your retirement, when you will probably be in a lower tax bracket.

A division of capital investment can yield well without risks

The other conservative discipline required in successful asset management is to maximize your investment return within the guidelines of the risks you are willing to assume. In Mr. Cooper’s case, the most important objective is to preserve his $15,000 in capital and earn a better rate of return than is currently available in his savings account. Andy agrees he doesn’t want to get rich quick or take the risks associated with investments in commodities, options or real estate. Due to the limited amount of capital, I suggest that he defer buying common stocks until his investable capital is about $25,000.

To meet the objectives of preservation of capital and maximization of yield, I recommend that Andy divide his commitments into thirds. Using this approach he can invest one-third of his capital ($5,000) in savings certificates at his local savings and loan. The certificates are purchased at $1,000 denomination and would best be bought with staggering maturities from six months to 2½ years. In this way Andy will always have $1,000 available for re-investment and, if required, to meet a family emergency. At current rates Andy will earn an average of approximately 6½ percent or $317.50 annual income. Table II shows the effect of compounding Andy’s investment returns for 12 years and 22 years.

Another third of Mr. Cooper’s investable assets or $5,000 should be invested in a five-year quality corporate bond. This investment should be guided by the major rating services—Moody’s and Standard & Poor’s—and should not carry a rating below AA. These are bonds of the highest quality and will allow for the timely payment of interest and principal. Currently, these intermediate term bonds pay approximately 7 percent on an annual basis.

The last third of Andy’s and Linda’s money should be placed in a 10-year corporate bond. This bond should also carry an AA rating or better, but it should not be issued by the same company as the five-year bond. A 10-year corporate bond issued by a major industrial company is currently yielding approximately 8.20 percent or $410.00 per year.

Two points should be made here: 1) diversity of conservation assets is important to a person in Andy’s position, and 2) any program of this nature should be reviewed at least once every two years.

| TABLE I |
| Monthly Savings | Savings Compounded Daily at 5% |
| $50.00 | $7940.00 | $21453.00 |
| 100.00 | 15881.00 | 42926.00 |
| 125.00 | 19852.00 | 53657.00 |

| TABLE II |
| Interest Rate | 1976 | 1988 | 1998 |
| Savings certificate | 6.5% | $5000 | $10000 | $18976 |
| AA corporate bond (5-year maturity) | 70% | 5000 | 11261 | 22152 |
| AA corporate bond (10-year maturity) | 82.5% | 5000 | 12873 | 28311 |
| Totals: | $15000 | $37629 | $69439 |

Individual Retirement Account (IRA) for both Andy and Linda. Fortunately, Linda has an IRA account in her local savings and loan where she initially deposited $500 at the end of 1976. Since a contribution of up to 15 percent of your earned income (to a maximum of $1,500) is allowed in an IRA, Linda could have contributed $750 to her program. One of the major advantages of an IRA is that the taxes on any interest or gains accumulated through the IRA are deferred until your retirement, when you will probably be in a lower tax bracket.

* Our profile is based in part on the 1974 Case and Company, Inc. report, "Survey of the Membership," commissioned by The American Institute of Architects. The report states that the typical AIA member is a white male about 46 years old and married, with an average of three dependents. The average salary received by AIA members in 1974, including profit sharing, was $26,630. The author's research revealed that the wives of most of the interviewed architects work either part- or full-time.

Pollard is a senior account executive with Merrill Lynch, Pierce, Fenner & Smith, Inc., New York.
Elegant, easy-to-maintain washrooms in the Sacramento, California, Civic Center include Bobrick stainless steel washroom equipment and laminated plastic toilet compartments. Bobrick paper towel dispensers are recessed into the mirrored wall. Large capacity recessed waste receptacles meet the demands of heavy traffic flow. Soap dispensers are conveniently mounted on the lavatories. Laminated plastic toilet compartments defy graffiti and corrosion. With concealed stainless steel hardware and uniform thickness of doors, wall posts and stiles... these compartments have a distinctive “flush-front” appearance. Bobrick offers a “total design concept” of coordinated equipment for today’s new washroom. Send for our Planning Guides and Catalogs. Bobrick Architectural Service Dept., 101 Park Ave., New York 10017. Bobrick products are available internationally.
I automated project control system aims for improved profitability

Neil Harper

early fifties, just over 20 cents of every dollar of gross billing was retained as before-tax profit by architectural firms. This profit margin has steadily decreased over the past twenty years, that today profitable firms estimate the margin closer to 5 to 10 per cent. Rising labor costs and outpaced limited increases in professional fees, and the scope of services offered to clients in the last two decades has grown enormously—without corresponding adjustments in compensation. These two factors alone—increased costs and scope of services—have placed the burden of developing improved compensation negotiation techniques and in cost controls, if profitability is to be preserved.

In its April 1975 publication of Compensation Management Guidelines for Architectural Firms, The American Institute of Architects ided a rational and equitable basis—acceptable to both architects and clients—for defining cost-based compensation. This act in effect, emphasized the comprehensive role of architectural services, while offering a less-like alternative to the fee-schedules abandoned under Justice Department scrutiny in 1973. (A revised AIA manual developed with the American Consulting Engineers Council and being readied for this spring, will title Compensation Guidelines for Architectural and Engineering Services.) Implicit in this compensation development format is a format for monitoring design services, and over-all firm profitability. Further, whole process can be automated.

The Computer-Based Financial Management System (CFMS) operated by the Cambridge, Massachusetts, consulting firm of Harper and Shuman, Inc., is a national computer accounting system that has been recently programmed to accept the cost-based compensation budget data. The architect with periodic “Project Progress Reports” to compare actual expenditures with the budgeted amounts. The report is based on input supplied by the architect—by mail or through a computer terminal—according to the formatted worksheets found in the compensation guidelines manual. Figure 1 represents a report for a prototypical City Hall project, summarized by department and phase.

Both hours and dollars are presented, for the current period and for the project-to-date. The report includes direct labor, overhead allocation, and direct and reimbursable costs. The estimated percent of work completed, reported by the project manager, is used to prorate the total budget to give the “Earned Budget” column. This Earned Budget can then be compared to the “Spent to Date” column to provide a ready assessment of each labor or expense item (see boxed areas). An alternate comparison is also offered in the column, “Expended (S) vs. Reported (hours)” per cent of work completed. When the expended amount exceeds the reported amount significantly, corrective action of some sort is required.

An option feature of the Project Progress Report is the presentation of financial data at the bottom of the report. The top part of the report shows the costs of services provided; the bottom part adds information dealing with compensation: commission size (compensation), earned income, billing, and profit or loss.

A second report monitors firm-wide profit plan

Principals and project managers in most firms tend to think of their firm’s activities and performance as a series of projects. It is also true, however, that firm-wide performance is often presented in terms of an income/expense statement which is based on a general ledger formulation of data; rather than based on a project-by-project formulation.

Figure 2 is such a presentation: a “Profit Planning Monitor” report showing a firm-wide profit plan in terms of income and expense items. In the example shown (see boxed areas), the Annual Plan has budgeted $860,000 for income, $686,000 for total expense, and $172,000 for profit for the total year. Through March 31, this should have resulted in a $34,400 profit, but only $24,147 was actually generated, due primarily to overruns in the indirect expenses (by $701).
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Jodge/Sweet’s construction outlook, 1977: first update

Ticking for total construction contract value for 1977 is now even stronger than it was just a few months ago: a record $123 billion—up 15 percent, with gains in nonresidential, residential and nonbuilding construction. Public works spending, the time-honored means of creating jobs during recessions, will be escalated. With $2 billion already granted under the Local Public Works Act of 1976, Mr. Carter would add another $2 billion to the current year’s authorization and extend the program through fiscal 1978. (Otherwise, it would expire September, 1977.) Housing is an area where the Carter Administration hopes to accomplish two goals at once: stimulating economic activity while improving urban living conditions. Specifics have not been announced as yet, but some form of inner-city housing aid is a good bet.

<table>
<thead>
<tr>
<th>Residential Construction Contract Value (millions of dollars)</th>
<th>1976 Actual</th>
<th>1977 Forecast</th>
<th>Per Cent Change</th>
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</thead>
<tbody>
<tr>
<td><strong>Nonresidential Buildings</strong></td>
<td></td>
<td></td>
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<tr>
<td>Office Buildings</td>
<td>$ 4,122</td>
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<td>6,315</td>
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<td>Educational</td>
<td>$ 4,980</td>
<td>$ 5,450</td>
<td>+9</td>
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<tr>
<td>Hospital &amp; Health</td>
<td>4,590</td>
<td>5,050</td>
<td>+10</td>
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<tr>
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<td>5,980</td>
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<td>+9</td>
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<td><strong>Total Institutional &amp; Other</strong></td>
<td>$ 15,550</td>
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<td></td>
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<tr>
<td>1- &amp; 2-Family Homes</td>
<td>$ 35,958</td>
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<td>Apartments</td>
<td>6,550</td>
<td>8,000</td>
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<td>Highways &amp; Bridges</td>
<td>$ 7,884</td>
<td>$ 9,300</td>
<td>+18</td>
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<td>Utilities</td>
<td>15,610</td>
<td>16,500</td>
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| Total Construction Index (1967 = 100)                          | 194         | 223           |

<table>
<thead>
<tr>
<th>City Area of New Buildings (millions of square feet)</th>
<th>1976 Actual</th>
<th>1977 Forecast</th>
<th>Per Cent Change</th>
</tr>
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<tbody>
<tr>
<td><strong>Nonresidential Buildings</strong></td>
<td></td>
<td></td>
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<tr>
<td>Office Buildings</td>
<td>108</td>
<td>115</td>
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<tr>
<td>Stores &amp; Other Commercial</td>
<td>343</td>
<td>390</td>
<td>+14</td>
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<tr>
<td>Manufacturing</td>
<td>151</td>
<td>175</td>
<td>+16</td>
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<tr>
<td><strong>Total Commercial &amp; Manufacturing</strong></td>
<td>602</td>
<td>680</td>
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<tr>
<td>Educational</td>
<td>120</td>
<td>130</td>
<td>+8</td>
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<tr>
<td>Hospital &amp; Health</td>
<td>74</td>
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<td><strong>Total Institutional &amp; Other</strong></td>
<td>367</td>
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<tr>
<td><strong>Total Buildings</strong></td>
<td>2,815</td>
<td>3,180</td>
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</table>

Taking our first cut at a 1977 construction forecast late last year (Record, November 1976, page 65), we came up with a rather optimistic outlook (+12 percent over 1976)—but with more than the usual qualifications. There didn’t seem to be much doubt about the direction that construction markets were heading, but the strength of the further expansion of construction’s already-established recovery depended on three things: 1) a reversal of the mid-1976 “pause” in general economic activity; 2) a change in national priorities and programs; and 3) relatively dormant inflation.

Since October 1976, we’ve moved along nicely in all three areas. Last year’s spasm in the economy’s recovery worked itself out before year-end, giving 1977 a new start in the right direction. Leadership passed to Mr. Carter who proposes to encourage rather than restrain the recovery from here on. And inflation, after three horrendous years, finally receded to its pre-energy crisis rate. With three major conditions of our earlier forecast for 1977 satisfied at the start of the year, there’s little left to do now but raise our sights.

The economy: the push after the pause

Last year’s “pause” made its point very effectively: you can’t take recovery for granted. For an uncomfortably long time, a recovery is vulnerable to stalling out, as this one did. Such vulnerability continues to exist until the recovery reaches the point of being self-sustaining, and that point is reached when business capital spending finally takes over as the driving force of expansion.

Right now, with considerable excess capacity throughout most industries, we’re still quite a bit short of the self-sustaining point, and the case for stimulative monetary and fiscal policy in 1977 is every bit as valid as it was in 1975 and 1976. In fact, with inflation at its lowest rate in a long while, this could be the ideal time to close the gap between actual and potential production. Closing that gap is, after all, what creates the incentive for increased capital spending, which is, in turn, the key to growth, productivity, and price stability.

The President’s package: modestly activist

Only time will tell whether Mr. Carter’s $30-plus billion package of economic measures, which includes a variety of taxation and spending stimuli, will be too much, too little, or just enough prodding to guide the economy back toward full use of our resources. It cer-
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troweled over block
21 years ago still looks as beautiful today!

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WRITE FOR CIRCULAR #16.
It wasn't the most activist course the Carter Administration could have taken (particularly in a year of increasing federal spending), and it may even be slated for some beefing up by Congress before taking final shape.

The intangibles that go along with this approach—big government spending—could turn out to be even more important than specific programs. They strongly suggest that things will start happening in Washington—a place where not much has been happening lately. And history shows when things happen in construction, too.

Nonresidential building: the indirect boost

The gyrations of the nonresidential construction index during 1976 show how sensitive this area of construction can be to changes in the national climate. This seasonally-adjusted index, which reached its cyclical low point in November 1975, was making a good recovery through the first two quarters of 1977. It then fell back in the third quarter when the "rise" in business activity occurred, but recovered in the final quarter.

Maybe that close quarter-by-quarter paroxysm between nonresidential building and overall business activity is just a bit too good to be true, but it strongly suggests that the upturn in commercial and industrial building—which was interrupted in 1976, will be resumed in 1977 as the economy expands and building capacity is taken up. A 15 per cent gain in commercial and industrial building value—up from $16.6 billion—will seem on target for 1977, with more to come in 1978.

Institutional building, handicapped by the rapidly shrinking educational building market, showed little potential for growth in recent years. However, analysis of 2000 grants from the first $2 billion special appropriation under the Public Works Act of 1976 indicates a temporary change in this situation. Instead of the $57 billion money running heavily to the traditional road and sewer projects, a surprisingly large share (60 per cent) is being used for construction of nonresidential buildings. And of this share, nearly one-third involves school building or remodeling. In both 1977 and 1978 these public funds will temporarily pump life into the sluggish institutional building market, and so we're increasing this year's forecast to $17 billion.

Residential building: 2 million units soon?

In October, the "standard" forecast of housing starts for 1977 has escalated from 1.7 million units to 1.8 million. One reason: the seasonally-adjusted rate of housing starts actually averaged 1.8 million during the final quarter of 1976. Another reason: the Carter Administration is expected to take a continuing active role in housing markets.

Depending on how much shelter demand is satisfied by mobile homes, the optimum annual rate of site-built residential construction for the rest of the decade lies in the range of 1.8 to 2.0 million units. Considering the low output of the past two years, this potential demand implies a good probability of a 2 million-unit housing year in the near future—most likely in 1978, following this year's advance to 1.8 million. However, the mix of the housing supply will change in 1977 to include approximately 600,000 apartment units—up sharply from less than 350,000 in 1976.

Nonbuilding construction: it goes up too

In 1976 it was energy, not anti-recessionary spending, that gave rise to the strong gain in nonbuilding construction. In 1977, however, it will be highways, sewers, and other public works—supported by increased Federal spending—that will keep things moving ahead.

Last year brought a record number (30 vs. 25 in 1975) of increasingly costly (averaging $500 million each vs. $325 million) electric generating projects. The result: contract value nearly doubled last year to $15 billion, and that's even more than we had been expecting for 1977. This year's utility forecast has been duly expanded to $16.5 billion.

As 1976 drew to a close, a public works construction was just beginning to respond to last October's special appropriation of $2 billion to increase employment in construction, and our earlier expectation of a strong rate of contracting for roads and sewers during the first half of 1977 still holds. However, the previously expected second half decline has to be postponed in view of the Carter Administration's intent to extend Congress' "quick fix" through all of 1977 and into 1978 as well. Roughly one-third of these special public works funds are being directed into highway and sewer construction, raising 1977 totals to $9.3 billion and $7 billion respectively.

George A. Christie
vice president and chief economist
McGraw-Hill Information Systems Company

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<thead>
<tr>
<th>Regional Construction</th>
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<th>Midwest</th>
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<tbody>
<tr>
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<td>$8,100</td>
</tr>
<tr>
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<tbody>
<tr>
<td>Commercial &amp; Manufacturing</td>
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<td>$4,500</td>
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<td>$6,773</td>
<td>$8,800</td>
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You'd think we just got into the jewelry business.

Isolated stem
won't corrode.
Never touches water.
Never needs lubrication.

Famous Aquaseal
diaphragm.
Non-rotating with positive seal. No grind. No drip. Keeps stem bone-dry.

Longlasting brass
body and parts.
Machined and cast for maximum serviceability.

Friction O-ring for comfortable feel.
The only conventional part of the valve.

Chrome-plated bronze valve seat.
Engineered to complement the Aquaseal diaphragm for positive shut off.

It glistens and shimmers like a finely-cut gem. Chrome or crystal handles have hot and cold indexing. The twelve-sided shape means maximum grip for wet or dry hands.

There's never been a fitting like the new Heritage. Inside is the famous Aquaseal—the most reliable valve you'll ever install.

It never needs stem repacking. Working parts just won't corrode.

See your American-Standard representative about Heritage fittings. And expect the best. Because that's what American-Standard is all about.

And that's why we're a household name.

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At Raynor we give it to you straight...and that's the way it stays!

Most overhead type doors look great when they're first installed. But given time and plenty of ups and downs they begin to sag in the middle.

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Or write Raynor Manufacturing Company, Dept. AR, Dixon, IL 61021, for the name of the Raynor factory-trained distributor/installer near you.

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They're strong, so you can use fewer members—and spacings can be wider (usually 24" O.C.). Wall sections can be pre-fabricated, on or off the site, and set into place as a unit.

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They work well with any form of construction. Use them separately—or as a complete framing system.

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United States Steel

United States Steel, P.O. Box 86 (C58-2)
Pittsburgh, Pa. 15230.
Please send me information on Super-C Steel Joists and Studs.

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City ____________________________ State ________ Zip __________

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Sub-Zero refrigerators are the only true built-in units designed exclusively for the home. They fit flush with standard base cabinets and can accept front and side panels to match any decor. You may choose from models 24 to 48 inches in width with capacities up to 32 cubic feet, the largest home unit manufactured. Choose from side-by-side, over-and-under (freezer on bottom), all refrigerator, all freezer and under-counter models. Units have icemakers and the luxury of completely adjustable storage to suit your needs. Every unit is factory tested for total performance before delivery.

Send for free colorful brochure on unique kitchens. Available in Canada

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P.O. Box 4130
Madison, WI 53711

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New Flor-Ever is commercial flooring at its best—designed like no other floor to meet changing commercial needs and demands, including virtually seamless installation in most applications.

Flor-Ever is a maintenance saver. Its availability in 12 foot widths for seamless or minimum seam installation means fewer soil traps and easier, faster cleaning. Fewer seams also mean faster, more dependable installations.

Its no-wax finish cleans easily, and gentle embossing enhances Flor-Ever texture but doesn't trap soil. Its extra-heavy commercial wear layer tests at new highs in resistance to abrasion and the problem stains in health care, food service, school, office and beauty shop application.

Great design and color workability. Flor-Ever is an appealing texture of subtle colorations to blend with any commercial interior. A broad, eight-color range meets beautifully with today's and tomorrow's most popular commercial trends in color and design.

Flor-Ever meets the specification requirements of F.S.-L.F.-001641, Type III, Class 1, and F.H.A. Minimum Property Standards for Single Family and Multi-Family Units. Meets H.E.W. requirements under the Hill-Burton Act with smoke generation of 450 or less. Flame Spread ASTM E-84 Tunnel Test of 75 or less, Class B rating with 0 Fuel Contribution. Installs on, above or below grade.

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Sliding Chain Link Grilles. Economical, side-storing traffic control closures.

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When Hewlett-Packard selects you to supply building system

It started with a building in Cupertino, California. Hewlett-Packard combined Vulcraft's computer designed steel joists and joist girders with a fast-track construction schedule, and helped shave two months off the construction time of the building.

This shaved the costs. Not just because the lightweight nature of steel joists and joists girders makes them easier and faster to erect than other, heavier systems. But also because supporting columns can be placed further apart. And foundation size can be decreased.

All of which makes the Vu system more economical than traditionally fabricated structural system. Simply because it's light and faster.

So much faster, that buildings like those constructed for Hewlett-Packard can be delivered to the job site in a fraction of the time that would otherwise be required.

Because electrical and mechanical systems can pass through the open web of the joists and joist girders, installation goes quicker. And changes can be made more easily when needed.

Although the Hewlett-Packard buildings Vulcraft system have basically the same design, the exterior features vary.

They expect results. They got them from Vulcraft, all six times.

As much as two months earlier if a traditional structural system were used. And the Vulcraft system has since been used in five Hewlett-Packard buildings: one in Cupertino; two in Corval-1; one in Boise; and one in San Diego.

The Vulcraft system can work just as well for you. To learn how to speed up your work, contact your local Vulcraft representative for your Joist and Joist Girder Specification Guide. Or write Vulcraft, P.O. Box 17656, Charlotte, North Carolina 28211. Or call 704/366-7000.

We have the know-how. And we have five plants located around the country to make sure your deliveries are on time. So your building can be ahead of its time.

VULCRAFT
A Division of Nucor Corporation

The Hewlett-Packard facility in Cupertino, California, the first of six to use the Vulcraft system.

The versatility of designing with Vulcraft steel joists and joist girders helps meet complex design requirements like this unusual eight foot high interstitial floor space.

Vulcraft joists and joist girders can be designed to easily accommodate all lighting, heating, air conditioning, wiring, duct and pipe requirements.
New USG® Z-Furring Channels build a positive case for energy savings!

- **POSITIVE ATTACHMENT.** Gypsum panels screw to Z channels that attach directly to concrete; hold more securely than systems with metal over insulation where "fishhooking" of pins can occur.

- **POSITIVE FIRE PROTECTION** is the direct result of this extra security attachment system.

- **POSITIVE FASTENER COST REDUCTION.** One size concrete fastener used for all thicknesses of insulation.

- **POSITIVE THERMAL TRANSFER REDUCTION** is afforded by the exclusive slotted design of these superior furring channels.

USG Z-Furring Channels are now available in 1", 1 1/2", 2" and 3" depths to meet today's demands for increased insulation to boost R-factors in masonry walls. These corrosion-resistant channels are formed from hot-dipped galvanized steel; take THERMAFIBER® Z-Furring Blankets, rigid polystyrene, or urethane insulation; minimize effects of structural stresses and help prevent wicking of moisture to inside surfaces. Call your USG Representative, or write now for latest literature complete with updated U-value charts.

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To most architects and engineers today, professional liability protection is a matter of course. 20 years ago it was a matter of luck.

We remember. That's why, back in 1955, we sat down with AIA, NSPE, and Continental Casualty Co., and came up with a breakthrough:

The first truly broad form liability coverage, for every qualified professional, in every state of the Union.

We've been right behind you ever since. With the first nationwide network of claims specialists. The first Joint Venture insurance. The first Equity Interest coverage. The first Construction Management protection. The only Post-Retirement policy. The most comprehensive Loss-Prevention service in the industry. The only coast-to-coast team of expert defense attorneys, with offices in nearby cities and towns across the country.

And the leading carrier in the field—licensed in each and every state and territory.

It's a 20-year record of leadership and performance. A record built on trust. Because we've always considered your interest first. And through good times and bad, while other companies have come and gone, we've been here. Our professionals have always been protected.

So when you consider what's at stake—your good name, your practice and possibly your whole career—there's really only one question to ask:

Why settle for anything less than the best?

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Ask your broker for details.
And you thought that
B.F. Goodrich
only made whitewalls.
we can make red walls, green walls, or golds. Barnboard walls. And grasscloth walls. Walls have a look of leather. Full rich vinyl textures of all kinds. And the B.F. Goodrich name is your assurance they’re quality vinyl wallcoverings. The very we can manufacture. Each pattern and design stands out because we added a bit more to the textures. They’re deep. And because our wallcoverings are made ofic backed vinyl, they’re strong. And tough too. The beauty never fades. B.F. Goodrich vinyl textures can take a lot more wear and tear than paint can. And you won’t face the cost and hassle of regular repainting.

Think about it. And when it’s time to cover your walls, specify B.F. Goodrich.

Get a hold of our Koroseal® swatch book. Check Sweets for your nearest BFG distributor or call Sweets Buyline (800) 255-6880.

B.F. Goodrich. Our name says it’s the best.
The beauty of Alcoa Coilzak ir parabolic luminaires is the beautiful way it controls light.

Parabolic luminaires are esthetically pleasing, in the design of the fixture and in the type of light they dispel. This is particularly important where people work, read or shop, where low visual brightness contributes to a comfortable atmosphere. The secret is precise light control, made possible because the reflective material in quality parabolic systems is Alcoa® Coilzak lighting sheet. Note that we said lighting sheet. In a properly designed luminaire, reflectivity is only part of the story. Controlled image clarity and reflective diffusion are just as important. Alcoa Coilzak sheet is an Alzak®-finished reflector material that meets precise reflectivity and gloss standards.

Operating costs of a parabolic lighting system can be low. Because of its efficient light distribution, a properly planned system may require fewer luminaires, resulting in low electrical loadings. Savings in cleaning maintenance are possible also. Parabolic luminaires do not require a lens and the unique design plus the static-free Coilzak louvers, resists soil and dust accumulation.

For more information on the many advantages of Coilzak lighting sheet in parabolic luminaires, write Aluminum Company of America, 310-C Alcoa Building, Pittsburgh, 15219, or see us in Sweets under 16.10a/AL

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1. One-piece constructed Coilzak reflector with accurately controlled parabolic shape.
2. Extruded aluminum trim.
3. Coilzak parabolic baffle assembly.
This full-recessed drinking fountain

Goes on Giving!

A drink of water now, when the building is new, and for years to come. Haws incorporates this unparalleled product reliability within a smoothly molded receptor of Polymarble. Suit your decorating fancy with Tan, or give some thought to Satin Gray, Yellow Mist, Cerulean Blue, Pistachio Green or White. With any Polymarble fountain you choose, there's luster that lasts, to resist bumps, abrasion, chalking; plus the cleanly swept appearance of recessed bubbler and flush-mounted push-button valve.

Polymarble drinking fountains, part of the Haws experience in reliability since 1909. For full product information and Polymarble Color Selector, contact your nearest Haws Representative or Haws Drinking Faucet Co., 1441 Fourth Street, Berkeley, CA 94710.

Haws

DRINKING FOUNTAINS

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The Connecticut Connection.

Andersen joins character with convenience at a New England townhouse complex.

Joining the character of the traditional look with the convenience of the contemporary life was a primary objective of this project.

That's why Andersen® Perma-Shield® casement and Narroline® double-hung windows were chosen.

The inviting nature of the casements... the classic styling of the Narroline units... the charming angle bay and bow arrangements... all helped in establishing a warm, pleasant, traditional appearance.

But even more importantly, these Perma-Shield windows helped link the Connecticut townhouses to carefree living.

Because all Perma-Shield window surfaces exposed to the weather (except the Narroline sash) are protected by a rigid vinyl sheath.

A durable, long-lasting shield that provides convenience by virtually eliminating maintenance—it's designed not to rust, pit or corrode. Not to chip, flake, peel or blister. (The Narroline sash is safeguarded by a weather-resistant polyurea finish.)

And with double-pane insulating glass, these snug-fitting windows offer a major part of the fuel-saving benefits of single-glazing with storm windows, plus the convenience of no storm window cleaning.

Are you working on a project that'll bridge the look of yesterday with the life of today?

Bring it together with Perma-Shield casement and double-hung windows.

For more details, see your Andersen Dealer or Distributor. He's in the Yellow Pages under "Windows." Or write us direct—Andersen Corporation, Bayport, Minnesota 55003.

The beautiful way to save fuel™

For more data, circle 55 on inquiry card
The place: Knott's Berry Farm Airfield Eatery. The assignment: recreate a 1920's hangar... and with it, all the fun and excitement of that most flamboyant of eras. For assistance with the restaurant's spectacular barrel arch roof, architects called on Trus Joist engineering.

Our advanced engineering technology accomplished easily what other systems couldn't. MICRO4LAM® chords were brought to a taut 35° radius curvature through an arc of 90° in a 50' span. Our lightweight, rapidly-installed wood-and-steel trusses are tough enough to handle the load, yet open enough to keep the old hangar aura.

Our technical representatives and engineers are experts and innovators in structural systems. We'll back you up from computer design and layout assistance to delivery coordination and jobsite inspection. So whether you're recreating the 20's or planning for the 80's, you can count on Trus Joist to make your place in history secure.

Architect: Ronald D. McMahon & Associates
Engineer: Ruthroff & Englekirk
Contractor: C and I Construction Co., Inc.

Specify Trus Joist. We've got our system down to a science.

For more data, circle 56 on inquiry card.
Josep Lluís Sert and Joan Miró were both born in the Catalan city of Barcelona and knew each other when they were young. Barcelona has nurtured other contemporary artists including Picasso, Dali and Tapies; and indeed Catalonia is still the intellectual and artistic center of Spain. To acknowledge the long-time importance of his birthplace in the development of modern movements in art, the eighty-four-year-old Miró has donated a large collection of his paintings, sculpture, ceramics, prints and books to the city of Barcelona. Friends of the artist helped raise fifty per cent of the money to build a one million-dollar museum to display this collection and other contemporary art, and the city of Barcelona contributed the rest. And Sert donated his architectural services.

Because Sert’s eminently rational, conscious architecture is in powerful juxtaposition to the joyfully irrational subconscious effusions of his friend Miró, the building and its contents are excitingly dissonant. Sert has dramatized this fundamental esthetic polarization, and the effect is wonderful.—Mildred F. Schmertz
The use of the outdoor areas and roof terrace (below) for exhibitions more than doubles the available exhibit area. The landscape design makes good use of the existing features and planting of the old park in which the building is located (photos right). There are four courtyards, each of which has a different character and use: (a) central courtyard; (b) court with Miró sculpture (left) serving as a balcony to the city below and the mountains beyond; (c) the old walled garden with its cypress trees and cypress hedges; (d) the multi-use court space for happenings, directly linked to the Center for the Study of Contemporary Art and leading to the bar and auditorium. The first floor plan includes (1) entrance; (2) exhibit rooms; (3) room for temporary exhibits; (4) bookstore; (5) auditorium; (6) service.

Montjuïch, a hill overlooking the old city of Barcelona to the north and the harbor to the south, is crowned by a castle built in 1640. Once wild, the hill is covered by a beautiful old park, much of which was designed by Forestier for the International Exhibition of 1929—the exhibition everyone remembers as Mies van der Rohe’s Barcelona Pavilion. These landscaped gardens include a number of important museums and palaces, an amusement park, restaurants and cafes. The hill is connected to the city below by winding drives and a funicular. The new Center for the Study of Contemporary Art/Joan Miró Foundation is superbly located below the castle, near the funicular and not too far from the Archaeological Museum, the Ethnological and Colonial Museum and the Palacio Nacional, visible in the photo at left, which houses the Museum of Catalonia.

This magnificent site was selected by Miró and Sert from several offered to the Miró Foundation.
on by the City of Barcelona. It is an ideal location for the purposes of the Foundation as a place for the study and display of its permanent art; a place to attract conferences, meetings and happenings; and a place where people can contemplate art, which at the same time offers facilities for a study of techniques.

The program for the complex was the product of a board of trustees appointed by Miró, and the late Joan Prats, a noted patron of arts and an early collector of his friend's work.

The Foundation Maeght in St. Paul de Vence, designed by Sert and built in 1964, served as a pattern for this programming. Sert points out that, like the Foundation Maeght, this new building is composed of fully proportioned spaces that have a variety of shapes, ceiling heights, sources of light, and degrees of openness.

The work and research spaces have been differentiated from the gallery space by inclusion in a three-story octagon. This shape strongly articulates the active as opposed to the contemplative side of the building. The octagon as a shape is very much a part of the architectural tradition of Catalonia—appearing often in the monasteries, churches, and fortresses of the Romanesque and Gothic periods and in the various Islamic monuments left by the Moors. While Sert's use of the octagon partakes directly of this grand tradition, the building also draws from the Mediterranean vernacular. It is white, vaulted, lit by clerestories, and oriented toward tiled patios and gardens. For all its subtle eclecticism, however, the building is not nostalgic. It is as intellectual and disciplined as Miró's work is deliberately not. The painter wisely chose as architect a fellow Catalan—become-cosmopolitan, whose work by
contrast enhances his own and whose knowledge of the culture of their birthplace is shared.

Sert sees the building as a series of volumes linked by a continuous, well defined circulation pattern. The way people move through these spaces is the key factor governing the plan. Circulation is strongly oriented in one direction so that people need not go through the same spaces unless they choose. The courtyards, gardens and roof terraces are part of this circulation pattern and are used for the display of sculpture, ceramics, mosaics and for gatherings of people on special occasions. In everyday use they are quiet spaces with benches permitting restful enjoyment of the gardens and art.

The plan has been devised so that some of the rooms are to be used principally for the display of the Miró collections. This display will be changing continuously because much of the work donated by the artist will be kept in storage or in traveling exhibits. The plan of
The visitor two main circuits. The first begins at left of the entrance and interconnects the entry rooms at the lower level with the gar­
eries and courtyards. At the climax of this route lies the two-story-high sculpture room, which contains ceramics, mosaics and tapestries. mp starting at the lower level of this room lies the visitor around the space and on to the second floor where he gains access to the study center. Here the rooms for the display of its open to the roof. Adjacent to the print lives are study rooms, administrative facilities and a connecting stair leading to the li­e on the top floor. At the end of his route, the visitor goes down this stair into the study­ center foyer adjacent to its 200-seat auditorium and from there back to the main entrance. A portion of this circuit through the cour­
s, galleries and roof top terraces can be closed off during the hours when only the study center is open. The other circuit takes the visitor to the right directly to the study center,
Included in the second floor plan at left are (1) sculpture room; (2) hallway; (3) print room; (4) balcony above first floor; (5) terrace with sculptures; (6) hallway at perimeter of exhibition space; (7) offices; (8) director's office; (9) restrooms; (10) print archive. The library and meeting room are on the third floor above the print archive and the auditorium is below on the first floor. The ramp (right) extends around all four sides of the sculpture room, allowing the work to be viewed from ever changing heights and angles. Miró has done several triptyches and the museum has two skylit alcoves to display them (below). These and other skylights (shown in the sections above) are similar to those used by Sert at the Foundation Maeght in Saint-Paul-de-Vence (RECORD, October 1974, pages 102-103).

which has its own courtyard and bar.

From both the exterior and interior, the building bears a marked resemblance to the Foundation Maeght at St. Paul de Vence principally because of the prominent semicircular light scoops. Other Sert buildings have these scoops: Miró's studio in Mallorca designed in 1955 (RECORD, January 1957, pages 138-140) and the law library for Boston University (RECORD, May 1964, pages 161-170) are two of the most familiar. The scoops make maximum use of natural light, as Sert considers it to be of utmost importance for the display of paintings and sculpture. The light is diffused; it bounces off the curved surfaces. White draperies are used where necessary to diffuse the bright Mediterranean light as it enters through the frameless glass walls, which reveal the patios and gardens. Lighting has been built into the scoops to replace the daylight in the evenings or to augment it when necessary.

The structure of the building is of re
ed concrete, used by Sert in the manner
ch is clearly his. If the scoops remind one
Foundation Maeght, Miró's studio and
Boston law library, the handling of the
e-story, octagonal element is in the spirit of
Holyoke Center at Harvard (RECORD, May
2, pages 131-146), the rest of his work at
Sert has given the building
sufficient flexibility and potential for growth to
display the art of our time and of the future in
a variety of ways. It is planned that eventually
half the space in the museum will be devoted
to the work of young contemporary artists. As
a symbolic harbinger of this, a gigantic sculp-
ture by Chillida (not shown) has been placed
in the front of the building, sharing this promi-
nent space with a sculpture by Miró.

A large basement is linked directly with a
basement will permit considerable future ex-
gelevator and stair and serves as storage
expansion. Since the building is not devoted just
pictures, sculpture, films and books. The
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CENTER FOR THE STUDY OF CONTEMPORARY
ART/JOAN MIRO FOUNDATION, Barcelona,
Spain. Owner: The Joan Miró Foundation and the
City of Barcelona. Architects: Sert, Jackson & Asso-
ciates—Josep Lluís Sert, Joseph Zalewski, Jaume
Freixa. Associated architects: Anglada, Gelabert &
Ribas, Barcelona, Spain (working drawings and site
supervision). Structural engineer: Jose Colbo. Consul-
tants: Rafael Serva (acoustics); Luis Riera (graphics).
Contractor: C. A. Piera, Barcelona, Spain.
The auditorium (right) is in the basement of the three-story octagonal element shown in the section (below right). The mural on the panel extending over the speaker's rostrum is by Miró. Shown below is the short ramp leading up to the sculpture room.

The view of the sculpture room at the lower level (right) looks up toward the ramps. The box-like spaces under the ramp frame small sculptures. These boxes project on the exterior and form niches for sculpture displayed out of doors.
Yale University is preserving its great late-19th-century architecture by remodeling the Old Campus

Since the 1930s, Yale's Old Campus has been the home of the freshman class—an enviable group, fortunate in having overcome stiff competition to be admitted to one of the nation's leading universities. Generation after generation has moved into three splendid High-Victorian dormitories—Farnam (1869-70), Durfee (1871), and Lawrance (1885-86) all three designed by Russell Sturgis, Jr; and two fine examples of the English Collegiate style—Welch (1891) by Bruce Price and Vanderbilt Hall (1894) by Charles C. Haight.
Unused or partially wasted attic and basement space has been transformed into student living and bedroom suites

Except for the switch from gas to electric light, the periodic upgrading of plumbing and heating facilities, and general maintenance, these dormitories have been little altered since Farnam was begun. In recent years they have become desperately crowded. Double-decker bunks were crowded into small bedrooms originally designed for one. Up to eight students shared a single toilet, sink and shower in small awkward bathrooms in public hallways. To avoid using double-deckers, many students put their beds in the living rooms of what had grown from two-person to four-person suites, thus destroying what had heretofore been the shared communal space. For the students and their proud parents on moving-in day, only the euphoria generated by making it to Yale can have mitigated the thundering shock delivered by the first look at the tenement-like freshman suites.

Something had to be done. Several years ago a proposal for two new student residential colleges on nearby Whitney Avenue and Grove streets seemed to be the answer. John Hay Whitney of the class of '26 donated $10 million dollars for the proposed buildings planning began. Fortunately for the cause of extending the life of fine old buildings, the colleges fell through. The University and New Haven Board of Aldermen could not agree on a tax financing plan for the project and the Board refused to approve the construction. By the time this decision was overturned by the courts, building construction costs had become prohibitive. Furthermore, students at Yale and on other campuses who
Welch: The attic and fourth floor were combined with interior stairs to create large six- and seven-person duplex suites with double-height living rooms. On typical floors, four- and five-person suites were created with interior bathrooms by combining two former suites consisting of a living room each and bunk bed double rooms. One living room was converted to a double room, one living room remained, and all former bunk bed doubles were converted to single rooms.

Vanderbilt: The attic has been transformed into bedroom and living space. The basement, formerly used for storage and the old gravity heating and ventilating system, has been converted into suites by the removal of the large masonry heat boxes of the old system to gain space. The window sills were lowered and shallow grassed areaways were made on the campus side. The living rooms on the courtyard side are lit by semi-circular top lit areaways.
The late-19th century architectural character of corridors, entrance halls, stairways and principal entrances has been enhanced by the restoration. Beginning to realize how much they loved old buildings and preferred them as places to live, there was little enthusiasm among Yale students for the new residential colleges scheme. As a result of these considerations, Yale's president, Kingman Brewster Jr. will have spent $7.3 million of Whitney's gift on Farnam, Lawrance, Welch, Vanderbilt, Durfee and McClellan including furniture, landscaping, management costs and all fees. The quarters of 1,000 students will be renovated at a cost of $7,000 per bed. (Costs of new construction in New Haven in 1975 were figured to be $13,000 per bed.)

Brewster established a faculty-student committee headed by associate provost Jonathan Fanton to work with the two associated architectural firms: Edward L. Barnes, Architect, New York City and Herbert S. Newman Associates, New Haven. Every aspect of the renovation, from basic suite arrangements to the design of the storage units under each bed was carefully worked out among the Yale Office of Facilities Planning, the architects and the committee.

The goal of the renovation was to provide 120 beds and to reduce overcrowding; to bring the buildings up to the current life safety code; to renovate completely the heating, electrical, and plumbing systems; and to renovate all building finishes and the structure for long-term dormitory use.

The two architectural firms developed common design objectives for all the buildings to be renovated. First, they determined that the architectural character of each building was
reserved as much as possible by retaining original materials, details and external appearance of the buildings—which when taken as a whole represent a unique period in late 19th century American architecture. Second, they wished to provide a variety of room types sizes. Third, they decided to provide two means of egress from each suite, accomplished without affecting the privacy of adjacent suites. Fourth, they concluded that the rooms should be provided within the suites rather than at public corridors and stairwells.

The Lawrance typical floor suite corridors (Figure 1), and the basement corridor (Figure 2) are punctuated by a series of beautiful brick arches left intact by the architects. The arches have also been retained in the Farnam basement (Figure 6), and throughout the structure. The Farnam entrances (Figure 3) have new glass doors to accentuate the silhouettes of the beautiful pierced-stone transoms as seen from within, and to make the severely handsome character of the brick and tile stairwells visible from without. In the stairwells of Welch (Figure 4), new oak walls conceal emergency devices and utility closets while carrying the building's name and floor identification as an ornamental detail. The steeply pitched roofs in the Vanderbilt attic (Figure 5) make good space.
The policy of making the renovations invisible on the exteriors has enriched the interior suites stairhalls. This makes the bathrooms secure from intruders, permits bathroom sundries to be left in the bathrooms, and encourages student maintenance of their own bathrooms.

As planning progressed it was decided that a six-person suite arrangement of four singles, one double, a living room and a private bath shared by all six was the optimum arrangement. This organization of space had to vary in response to the actual conditions existing in each of the old buildings. Wherever possible the architects converted the existing suites originally designed for two but now containing up to four persons into suites for six. This was done by converting alternate living rooms into double bedrooms, thus permitting the crowded small bedrooms to revert to single occupancy. Although on typical floors, the density increased slightly, a significant number of additional beds were gained by taking over the attics in Vanderbilt and Welch and the basements of Farnam, Lawrance, Welch and Vanderbilt as living quarters. The attics and basements were remodeled with great care to minimize the effect on the exteriors.

The renovation of the four halls shown began in the spring of 1976 and the buildings were ready for occupancy last fall. Two additional halls including Durfee will be ready by the fall of 1977. The freshmen are delighted with their new quarters, which now surpass spaciousness and esthetic quality most of residential college living suites of upperclassmen including the cramped bedrooms of Eero Saarinen's Morse and Ezra Stiles Colleges (1960-62). Traditionally, when a student
The Welch duplex living room (Figure 1) is part of a suite for 6 to 7 persons. To achieve this space, the attic and the fourth floor were combined. The double bedroom in the Welch duplex (Figure 2) has windows of the type that were used in all the attics renovated. Constructed of aluminum-clad wood and tempered bronze glass they were designed for installation in a sloping roof surface with a minimum of disruption to the roof plane. The window has a reversing mechanism for exterior glass cleaning. The existing fenestration was kept intact in all buildings except for lowering basement sills or replacing sash, glazing and trim where necessary. Farnam is the only building with all new window trim (Figures 4 and 5). The existing trim in Lawrance (Figure 3) was left as is. Fully furnished mock-up rooms containing the elements shown in the isometric were carefully analyzed.
The generous old dormitories
had a lot of leftover space now brought to life

leaves the Old Campus, he moves up to better quarters. If this is to continue, Yale will either have to upgrade many more student rooms, or put its seniors back on the Old Campus, which once, long ago, was their preserve.

—Mildred F. Schmertz

A typical basement living room in Vanderbilt (Figure 1) is lit by a top-lighted circular area way, which meets the light and ventilation requirements with a minimum of disruption to the landscape and architectural character of the Vanderbilt courtyard (page 95). The circular seating area (Figure 2) is in a basement apse in Farnam. The second floor living room in Lawrance (Figure 3) extends into the turret, formerly occupied by an inadequate toilet facility. As already mentioned, the furnishing of the student bedrooms was done by the university according to mock-ups carefully studied by the architects, the students and the university management. The living rooms, however, have been exuberantly furnished by the suite occupants themselves, with the traditional reliance upon the New Haven flea markets.
Impressive new government center around a grand atrium space

An important new public building has been designed as the focal point of a developing civic center in Minneapolis. In a bold design approach, John Carl Warnecke & Associates provided a public space in the grand tradition of civic buildings that is also compatible with today's needs, a scheme that combines what the architects refer to as "informality within monumentality."
Completion of the Hennepin County Government Center in Minneapolis marks the beginning of a new civic center that will encompass an 18-block area when completed. The civic center's master plan (also designed by the Warnecke firm) was premised on the design of this building as the focal point of the area. While the plan establishes guidelines for future public and private development within the parameters (including the location, height and bulk of buildings, and the position of open spaces—all interconnected by pedestrian aerial walkways), it does so with all aspects relating to the Center.

The Center's design concept was based on an exemplary planning process by both the architects and a facilities analysis and design firm, SUA, Inc. SUA began an extensive, detailed space utilization study in 1965; its recommendations subsequently stimulated the passage of 23 bills by the state legislature that reorganized the county government. One major recommendation which affected the design was the separation of county administration offices from the district and municipal courts. To express these two distinct services, a 24-story twin-tower design evolved (the east tower housing judicial facilities, the west tower housing offices).

The outstanding feature of the building, however, is a 350-foot-high atrium created between the towers, bordered dramatically with exposed steel diagonal bracing. It is a great indoor space, enjoyed by the public and the employees—fully appreciated as a controlled, year-round environment, not affected by the changeability and severity of the Midwest's weather. The atrium is flooded with light through a combination of glass end walls and a large skylight. At the roof line, enormous exposed steel tetrahedrons frame this skylight and the corridors of the top floor.

By siting the structure so the inner court aligns with the towers of the old Municipal Building across the street (designed by Long and Kees in 1906) and by using glass curtain walls on this axis, views from the atrium are opened up and primarily focused on the old building, signifying the relationship and continued coordination of services between the two structures. Compatibility of the two buildings is further enhanced by the use of carnelian red granite on the new building's fa-
cade complementing the older building's granite exterior walls.

A unique structural system solved the inherent engineering problems of the atrium concept (Record mid-August 1974, page 82). Diagonal wind-bracing was positioned on the interior walls facing the atrium rather than on the perimeter of the building, and exposed the full height of the court. The total space frame acts like a cage, stiffening the building's frame, minimizing building drift and allowing 85 per cent usable floor space in the towers. It accepts lateral loads (transmitted from the composite floors through diaphragm action) and distributes the stresses downward throughout the 180-foot building length. The cage is supported below the public service level by 30-inch-thick concrete shear walls, constructed on bedrock. The building spans a street using a conventional support system (rolled structural steel shapes, designed compositely, with a concrete topping slab).

Because the center spans a street, spaces were created for two large landscaped parks. Recycled water from the north plaza fountain flows one story below the street level, and can be seen from a large cafeteria. This level also connects the two government buildings and houses jury, computer, mail and printing facilities.

A total cost of $49.3 million for the building (not including $1.9 million for landscaping and site work) was achieved. This is a surprisingly low $34 per square foot, with a large part of the savings resulting from the structural ingenuity of the diagonal bracing, which required less steel and fewer complicated connections of members than in many more conventional systems.

Despite a noticeable difference between the interior tower facades bordering the court (only one side is glazed for acoustical reasons) there is no air conditioning imbalance throughout the 4.3 million cubic foot court space, for a wall set back beyond a corridor in the opposite tower performs an offsetting effect. Seven elevated walkways (spaced every third floor above the public service level) span the court, connecting the two towers. Eventually a series of elevated bridges will connect this building with others in the civic center.
The design of courtrooms (top and right plan, page 105) affords the most modern security measures while solving acoustical and lighting problems. Public access to courtrooms is only by a corridor on the atrium side, while judges' chambers are located along the perimeter with access to the courtrooms by a separate inner corridor. Prisoner holding cells and auxiliary court personnel offices are also near the inner corridor. A Commissioners' meeting room (above and right) provides an unusual design concept for public meetings. Seating is provided for only 90 persons inside a glass enclosed meeting room, with additional seating for 200 persons outside the enclosure, allowing limited direct public participation.
Last summer, Richard J. Daley, the late legendary mayor of Chicago, decided to drop by his favorite building. He had long been seeing to it that as many new buildings as possible got built, but his favorite one was altogether different. This was Navy Pier, built in 1916 to the design of an architect named Charles S. Frost, and now, 60 years later, being rebuilt to the design of the mayor’s Bureau of Architecture, whose chief is Jerome R. Butler, Jr., the mayor’s City Architect. Why would an abandoned pier, 3,040 feet long and 292 feet wide, have excited Richard J. Daley so much? Maybe he knew that its fun-handling facilities, as much as its freight-handling facilities, had excited many people over the years, and maybe, too, he thought that, turned into shipshape condition, it would be the best place for them to take in the skyscraper-studded skyline that his 21-year rule helped to create.
A

h, but the ragtime was resonant. It is almost as though Scott Joplin had taken up architecture. But when Chicago, in 1916, let out with “Municipal Pier No. 2,” stretching three-fifths of a mile eastward into Lake Michigan, people recognized it right away as the kind of place they could tap their feet to. And as the Twenties roared, the pier turned into the marathon mix of function and mood that it was meant for, achieving necessity, amenity, and levity all at once.

Excursion boats, cargo ships, and lake steamers moored alongside its parallel double-decked sheds, each 100 feet wide and jumping with stevedores, passengers, and freight. At its outermost reach was a recreation area with high arcades and extravagant esplanades. Crowds attended art shows, plays, trade fairs, picnics; and they danced inside a glittering, cavernous, 3,500-seat concert hall and auditorium, canopied with soaring metal-ribbed arches. Hook, line, and sinker, Chicagoans fell for the place. Even dusk fell for it, as the lanterns atop the two 165-foot concert hall towers glowed to the rhythm of the bands playing on.

It was called a modern Sans Souci, a place without a care, and as long as they were in a position to behave similarly, this relentlessly nautical, slightly naughty pier gave Chicagoans a round-the-clock mix of reasons for getting together—and inexpensively.

Not that Chicagoans, or anyone else, are without a care these days; but in 1974, Mayor Richard J. Daley, full of Bicentennial fervor, decided that a Sans Souci might be just the thing for Chicagoans, and, as he had a habit of doing, he called up his City Architect, Jerome (Jerry) R. Butler, Jr., head of his Bureau of Architecture, and said to find out what could be done to shore up the old swinger.

Under Jerry Butler, who, unlike many city architects, was encouraged to call up the mayor about almost anything, the 100-person Bureau has become one of the most design- and quality-conscious public facilities agencies in the country, a professional proficiency that Daley’s successor, to be chosen in a special election in June, should encourage.

The pier, the Bureau staff soon determined, hadn’t been in any shape for fun and games for years. Because as the Twenties whimpered away, people had been in less of a mood for them as well. Passenger traffic on the Lake dwindled, what with the Depression, and, besides, the auto replaced the steamer as the way to go. Although the pier continued as a recreational facility through the Thirties, the music stopped for good in 1941. Renamed Navy Pier, the place went to school as a training base, its spaces hastily subdivided for offices and classrooms.

It went to school a second time, in 1946, when the University of Illinois, hit by the GI Bill influx, leased the pier, and, until 1965, it jumped with undergraduates attending what became known fondly as “Harvard on the Rocks.” By this time, despite a flicker of freight traffic and occasional trade shows, Navy Pier, especially at the eastern end, with its domed terminus, had become a haggard, almost hopeless mess of partitions, awkward additions, blocked-up windows, and disheveled terra cottta detailing. Parts of the copper roof were seen to blow off, and, by the time the Bureau team, led by Jerry Butler, Joseph W. Casserly, and Daniel G. Jones, showed up to see what could be done to help, parts of the concrete slab, laid over some 21,000 Oregon timber pilings, had dropped into the water.

With city plans for a huge international trade fair/lakefront festival in the works, and with thousands of people expected in connection with these events and the Bicentennial summer, the Bureau came back to Mayor Daley, who had seen Navy Pier plans come and go, with a plausible two-phase program. The first phase, for which the City Council appropriated $7.2 million (later supplemented by over a million more), took care of the restoration and adaptation of the worst-off buildings at the end of the pier; work was accomplished, from design to rededication, in just the twelve months leading up to the Bicentennial. The second phase, for which programming is being finalized and marketing studies done, will, when approved, transform the remaining 340 feet of pier—the old freight and passenger sheds running west from the fixed-up recreation buildings—into a full-fledged pleasure dome, combining cultural, commercial, and added recreational elements.

Coming to terms with the first phase, Jerry Butler recalls, “The major design problem was refraining from doing too much. We had to purg the place of the physical alterations that had accumulated over the years, and that had all but obscured the original character of the public recreational facilities. And we had to determine the extent of basic, largely concealed, structural deterioration, resulting from 60 hard freezes and those awful storms. The technical and esthetic challenge was to match the color, texture, craftsmanship, and ornamentation of another era, while keeping an eye on the costs, and to make room for a mix of present-day recreational and cultural activities, without resorting to slick shoe-in effects.”

Of the $8.2 million spent on the first phase of work, 20 per cent will never be seen by the pier’s adoring public. All that went into basic structural repair. The steel-frame, brick-clad structure had to be exposed and examined. A lot of the steel, it was found, had become dangerously weakened. The precarious condition of the floor had to be corrected by ripping up substantial portions of the concrete slab and replacing the piling caps. The expansive outdoor esplanade had to be raised two feet in some places, three feet in others. Deteriorated masonry and terra cotta had to be carefully removed, and new materials, even more carefully selected for their matching properties, put into place. The idea was to return the buildings to their essential shell, in preparation for adapting the retrieved spaces for new use, and return them, also, to their essential integrity.

For example, the original cast iron window and door frames were fixed up as much as possible, and, otherwise, these were replaced with steel frames of a compatible color. Eighteen different brick panels were laid up to determine the best masonry match. To replace the color and texture of the original terra cotta...
molding, limestone, costing half as much as new terracotta, was selected. A copper-coated stainless steel was chosen for the roof for the domed concert hall and auditorium.

Says Dan Jones, project manager, who practically lived on the site during construction, “You could almost feel the pier coming alive again. And as we cleaned it up, clearing out the clutter, the place seemed to embellish itself because of the things we were taking away, not because of what we were adding.”

The original skylights, for example, sealed over by successive users, were unsealed and, in some places, expanded, so now a lot of natural light filters in. The Shelter Building, as it was called, was initially a kind of open bridge, connecting the Terminal Building just west of it, with the rounded, domed concert hall at the end of the pier. The second level of this “bridge” was enclosed with glass, creating a beautiful 20-foot-high year-round “shelter,” while its ground level was opened to let the outdoor spaces and breezes flow underneath across the site.

In the case of the old concert hall and auditorium, steps were taken to improve acoustics and mechanicals, but, other than that, it is its good old self. One of the best interior spaces is the second-level promenade, which was retrieved by removing the window frames along the inner wall overlooking the hall, and by installing new windows around the outer wall. These arch-framed openings are arrayed all around the big building and the promenade performs as a balcony for both the hall and for surveying the lakefront scenery.

That scenery is not unlike being on a ship, and it is hardly steerage class. While the interior floors are finished with terrazzo, the outdoor esplanades, representing five of the pier’s 34 acres, have been paved with an exposed aggregate, laid down in a checkerboard-pattern, which is picked up, again, on the roof promenades where a subtle deletion was also made by removing the continuous masonry pediments and replacing them with simpler metal railings, thus enhancing the lakeside views and lightening of the top-heavy look of the structure. Pointing up the people-and-play-oriented mood that Mayor Daley, week after week, was insisting on, trees, benches, and flags were supplied. There was even a carousel, the Mayor’s idea.

The festive mood he envisioned out here on the Lake is in hibernation these harsh winter months, but many possibilities are being pursued by the Bureau of Architecture for the second phase of the project so that it can be used all year. According to these projections, the upper level of the north and south sheds, which have been used as exhibition halls, would be renovated, mostly for exhibitions, and partly for tennis courts, which would be two levels in height. The lower level of the north shed would house assorted restaurants, shops, and other athletic facilities. Just north of this, between the pier and the low-lying Central Filtration Plant by C. F. Murphy & Associates, a marina has been proposed. The marginal amount of overseas shipping that has survived would be encouraged to continue and even expand, helping to restore the atmos-
From the Head House on the shore end of Navy Pier (near left) to the Terminal, Shelter Building, and Auditorium far out in the Lake (below), Navy Pier, rededicated last summer after years of deterioration, is a relentlessly nautical array of flexible interior spaces and dramatic outdoor esplanades. From the roof garden of the Shelter Building (far left), or from the newly paved and landscaped plazas, there are sweeping, well ventilated views of the skyline. The festive atmosphere (right), will be greatly amplified in the proposed second phase rehabilitation of the parallel sheds.
phric as well as commercial benefits of having it around, and right in view. To the south of the pier, the existing Dime Pier (in the old days it cost that much to walk out onto it) would be converted for rod-and-reel fishing.

Studies have been made to show the feasibility of converting the big hall for professional theater and other sections of the north shed for educational use. Should an outfit like the Naval Reserve Armory or the Goodman School of Drama take space, as has been suggested, "Good Ship Lollipop" will never be the same again as all of the variations of the last 60 years are reincarnated in one spritely venue.

Construction plans are already underway for a solar space- and water-heating system, as the result of a grant from the Energy Research and Development Administration last October, and this will take care of over 30 per cent of the restored Terminal Building's needs. On top of the south shed, 8,500 square feet of solar panels will collect the heat, which will be passed into an exchanger, and then stored in a thermal tank full of circulating fluid. So even in the area of applied scientific research, the pier is proving that there is, after all, nothing old under the sun. The Bureau has also been going to considerable lengths from the standpoint of old technology to come up with a reproduction of the early street cars which used to careen through the complex from the lakefront out to the end.

It is this lakefront—the legacy of such "City Beautiful" advocates as Daniel Burnham and perhaps the most resplendent in the nation—which the reactivated Navy Pier is meant to enrich. Parks and abundant public facilities stretch eight miles to the south of the Loop area, and another eight to the north. The location of the pier, stretching out from the northern edge of the Loop, is crucial, because in its former, forlorn condition, it was an obvious dropped stitch in an otherwise continuous seam. As the second phase of the program unfolds, including the development of additional park land to the northwest of the pier, the lakefront will be truly complete. And a projected 1,225-car parking area to the southwest, slightly sunken and lavishly landscaped, will help alleviate the noxious presence of cars while, at the same time, making the pier more convenient for drivers. The 80-foot-wide space, running between the sheds, would also be converted for some parking (400 cars). Its east end, next to the Terminal Building, would be available for amusement facilities and fairs in the summer and for skating in the winter.

Looming across from its west-end Head House and entrance plaza is the curvilinear Lake Point Tower apartment house, by Schipper & Heinrich, which now inadvertently announces the pier, almost like a sign post, as one approaches the area from the city or whisks by on Lake Shore Drive. An interesting historical note is that the Tower's antecedent was Mies' unbuilt Glass Skyscraper Project, designed in Berlin in 1922—concurrent with the pier's first Golden Age. In an urbane composition, its brilliant descendant now bears witness to the pier's second Golden Age.

No so-called master plan ever called for such a relationship, which makes it all the
more worthy, because this kind of subtlety, linking the visual and symbolic increments of a city's experience, is not the kind of thing that master plans usually call for. So as the budgetary block-and-tackle for the pier's second phase is being hoisted into place, and while the ragtime of last summer's reunion with the dressed-up landmark is still ringing in everyone's ears, it can only be hoped that Chicago's new leadership will understand that the total retrieval of this one resource, with its potential for commercial and cultural vitality, is and will be helping to make the most of those resources that are already in place nearby. The only way to "make no little plans" (Burnham again) is to make connections between urban elements that were not particularly conceived to connect. Here was a lakefront park with a gap in it, a deteriorated pier creating the gap, a legacy of inlets on either side, and an isolated skyscraper craving company—all now brought into play. Now that is a master plan.

Navy Pier isn't completely out of mothballs yet. In fact, as part of the first-phase preparations for the Trade Fair exhibition spaces in the old freight sheds, a moth-balling substance was actually used to seal over the glass cracks and roof leaks—an exotic spray costing a nickel a square foot. But in addition to esthetic care and technical innovation, Jerry Butler's Bureau has worked a miracle of project management, a miracle, that is, in the context of most municipal construction procedures, which tend to grind exceedingly slow. Acting as general contractor, 22 separate contracts were awarded over a one-year period, which meant preparing 22 separate packages of contract documents. Skillful supervision and coordination of the work assured timely completion and, so it would seem, nothing was left out—right down to detailed, elaborate provisions for the handicapped and elderly.

When Richard J. Daley, almost obsessed by the place, dropped by last June to see how the work was coming, it was hard to pull him away from the 50 inner-city high school students whom he found, down on all fours, painting huge murals for the half-mile-long promenade along the north shed (these are on display at the Chicago Art Institute through March 31). The chords of camaraderie were proving irresistible then and, a month later, 100,000 people showed up to tap their feet again, moved by a counterpoint of fond memories from an earlier era. It was some event, including the visit of Norway's full-rigged Christian Radich (page 112), but with plenty of room and time for more activity, this building is full of potential. Anyone who is not for phase two probably hasn't been to Navy Pier. It's too late to slip the moorings on this landmark.—William Marlin

mages that attach themselves to individual pieces of commercial architecture are usually not particularly sweeping in their implications. They are almost never any spiritual overtones (as in religious buildings), there are few metaphors of hearth and home (as in houses), and where there are few striking symbols of public trust and civic action (as we sometimes expect in government buildings). Instead, the emphasis goes on one thing, selling the product. Thus lesig problem for the architect—or at least the first part of the problem—is: how to make a good store which attracts his attention and answers for them the question of “Where can I shop?”

It makes “good” commercial architecture

We do business, and when bringing in the business is the high road (as in commercial architecture). The architect who follows this will not necessarily achieve the status of fine artist (nor will he be appraised of it therein), and his works may not be seen in the buildings that are generally known in the pages of architectural history books. Few stores ever have

1. The sew room in the books anyway, after all, and so that is not the great cause for concern. What is a cause of first concern is that the architecture of a store should work, it should attract attention, and it should draw in customers. All of the stores shown in this Building Types Study meet this criterion, and that is one of the reasons they have been included here. Another reason—and a slightly unfinished one—is that all of the stores shown in the collection that follows are designed for suburban shopping centers. Until quite recently, if even then, architects felt slightly uncomfortable dealing with popular phenomena like showrooms and like the car, and so the suburban shopping center has seemed to represent the nemesis of bad taste and the nadir of architectural endeavor.

1. Multaneously, the general public—sated, perhaps, with a 30-year e-family romance—has just begun to show a rekindled interest in center city as a place to shop, and this interest is beginning to be channeled into what Business Week magazine called a “basic shift in retail strategies,” involving the renovation and sometimes the total abandonment of “flagship” stores in major urban centers and the implementation there of as well of traditional suburban shopping center design niques. ARCHITECTURAL RECORD, too, in the December 1976, special issue, “The Home Towns Come Back,” has described the beginnings of a new wave of interest in medium-size towns as alternatives both suburban and to the great cities.

All of these things are nonetheless still beginnings, and however much they will be welcomed by urbanistic architects and applauded by center city fans, they are movements that are still in their infancy. The greatest concentration of shopping facilities today is still in urban locations, and sites there—as just about everyone has already marked—are particularly fraught with peril when it comes to attracting the attention of drivers-by and would-be shoppers.

Attention-getting clamor

Suburban commercial sites generally have a manic proliferation of signs, gewgaws, and paraphernalia that work hard to hype up the battle for attention to the proportions of a major war. And it is a war somewhere between Vietnamese and Pyrrhic in quality, with no clear winners and lots of losers.

How, then, does the individual store (and that store’s architect) make an impression in the midst of all this clamor? Surely, in this context, the stealthiest course is to eschew the “more” and “bigger” treadmill and to pursue instead the course of “different.” All of the suburban stores shown in this collection try to be different from the standard suburban store, but they do it in two very different ways. The first one—Burdines Department Store in Tampa—sets out to be “nice.” The second group of stores—designed by the New York City architectural firm known as SITE (for “Sculpture in the Environment”)—sets out, broadly speaking, to be strange. Both approaches, though opposite, seem to work admirably, and both are very interesting to look at.

Nicer and nicer

Burdines of Florida, a chain of department stores owned by Federated Stores, Inc. In the past five years, the chain has commissioned the large Florida firm of Reynolds, Smith and Hills to design four new stores—in Clearwater, Tampa, Sarasota, and Plantation. The Tampa store, now completed and shown on the following pages, is a good example of the kind of refinement and stylistic upgrading that many suburban stores are now receiving, a phenomenon that comes directly from the client’s need to have a building that seems special and that achieves its specialness by a general elevation in over-all quality. “We wanted to come up with something better, something unusual, something exciting,” say the architects of the Tampa Burdines; “we wanted to respond to the needs of our client for something that would really stand out.”

The solution was to clad the two-story building in elegantly reflective stainless steel panels—panels that, since they are slanted away from the perpendicular, reflect the movement of cars and people on the ground and, at night, themselves become a shimmering announcement of the store to passers-by. The interiors of the new store are finished off with as much finesse, so that the overall effect is one of simple, restrained, and modest style.

Stranger and stranger

Different from this are the designs by SITE for Best Products Company’s showrooms. Best Products, the country’s largest catalog showroom merchandiser, sells more than 10,000 nationally advertised hard line items in eight states. In 1972 the company hired SITE to provide a startling revision to its otherwise altogether standard showroom in Richmond (top photo, page 117). The public response was enormous, so SITE was again hired to do a large showroom in
Houston (bottom photo opposite), and they are now completing a third one in Sacramento and planning additional ones for Southern California. "We've always felt if we could get customers inside our door we could serve them well and have them come back," says Best president Andrew Lewis; "people either love the buildings or hate them, but either way they come in to enjoy them." James Wines, of SITE, adds, They're all screaming, 'How do you get people interested in shopping?' Whatever implications SITE's structures have, they will be public events."

Another (and higher?) "good"
A final note. Perhaps the most striking thing of all about SITE's stores for Best Products Company is a quality that they share with just about every piece of architecture that has any merit at all. It can be convincingly argued that, for all the extravagant variety of its manifestations, all good architecture has one thing in common: that it is at once familiar and unfamiliar, that it is vividly like something we already know about and, with an equal vividness, unlike anything else in the world.

Good architecture apparently doesn't thrive by being just one of these two things; it seems it has to be both, both like and unlike. Take the whole phenomenon of eclecticism, honored by millennia of practice and rejected by an early twentieth-century architectural aberration. Eclecticism is really about "like" and "unlike."

The Villa Rotunda in Vicenza is like Roman architecture (and virtue of that, like Greek), but it is also unlike it, being something now know as Palladian. Stratford Hall in Virginia—by far the most remarkable eighteenth-century house in America—is like the splendid country houses of the rich in Great Britain, and in fact curious historians have unearthed a house in Ireland whose plan is meant to imitate Stratford's "source." But anyone who has actually seen Stratford will recognize instantly that it is peculiar to Virginia, to its site above the lower Potomac, and to the famous family who built it.

The architecture of Modernism, too, is by no means immune to the business of being like something (no matter what the Moderns actually said), and fine buildings by masters like Wright and Mies and Le Corbusier follow suit: like the prairie, like the Maya, like a machine like a grain elevator, like a ship.

There is really no high mystery to the process of architecture being "like" and "unlike." It is as though we first need something comfortable and familiar (the "like") to win our confident attention and then something strikingly different (the "unlike") to stimulate a flood of further interest—and to edify, please, surprise, shock, or even to dismay.

All this brings us to the perhaps unsettling conclusion that SITE Best Products Company stores are—in much more than the functional, mercenary sense—"good" architecture. They begin by being like
twentieth-century classic, the familiar shop on the strip, and they went from there to turn that classic popular image (literally, in one on its ear.

The effect is astonishing, and it is also multi-dimensional. In one it is cataclysmic, an image that “responds to the unconscious esses of an America that is rediscovering pessimism,” one French has wailed, “an America deceived by big business.” True, the ge of a big chunk falling out of the corner of a building, or of the ling jacked up on one side, or collapsing, or being altogether ed over by an asphalt parking lot in some final apocalyptic h of the automobile—all of this can be seen as pessimistic.

But it is also funny—and fun, and profitable, and very powerful, s juxtaposition of the modestly familiar with the stunningly unfamiliar is like a bomb that arrives in a shoebox.

Herein, though, lies a slight problem, and it is the ironic petard e designers’ own cleverness: where do you go from here? After open the shoebox the second time (if you’ve survived the first) re not particularly surprised to see the bomb there; it’s no longer miar. Similarly, after you’ve done just about everything you can e standard commercial warehouse building short of turning it up- down, what’s left to do? Nothing gets stale faster than a performer only one routine. So it will be interesting to see what SITE’s next ber will be.—Gerald Allen
BURDINES DEPARTMENT STORE HOLDS UP A MIRROR TO PASSERS-BY

Henry O. Navratil photos
Aside from the large plinth-like structures at each of its corners, the facade of Burdines Department store is composed almost entirely of mirror-polished stainless steel panels that reflect the passing pedestrian and vehicular scene. The site for the department store is typical of suburban shopping centers, surrounded on three sides by vast expanses of parking lots. Landscaping is limited mainly to the periphery of the parking lots and to the area immediately around the store, so that there is very little to soften the visual impact of the undifferentiated asphalt surfaces. Accordingly, the unadorned facade with its large planar elements is appropriately at the scale of its immediate surroundings and makes a strong visual impact.
At nighttime, the facade of Burdines' Department Store glows in the reflected light of passing cars; it is of two-inch-thick, 30-inch-wide stainless steel and urethane foam padding.

"Most of us think of building materials as static things, although there are certain things always happening with light and shadows," say the architects. This particular facade, in their words, "has a capacity for changing its form and character—depending on the time of day and the kind of lighting, the time of year, and the things that are happening around it."

Inside, the store has two levels of retail space (shown in plans on the right) serviced by stage supply areas (shaded on plans) on each level.
The upper sales floor of Burdines of Florida Department Store in Tampa is reached by a centrally located escalator space topped with skylights (photograph opposite). Also skylit are adjacent display cases, shown in photograph below.

AN "INDETERMINATE FACADE" FOR BEST PRODUCTS COMPANY, HOUS...
"The concept" of this store, according to the designers, "is an architectural inversion of the standard merchandising warehouse located in a suburban shopping center. The brick veneer of the facade and side walls was arbitrarily extended beyond the logical edge of the roofline, resulting in the disconcerting appearance of a building arrested somewhere between construction and demolition."

SITE'S "NOTCH PROJECT" NOW UNDER CONSTRUCTION IN SACRAMENTO.
For the Sacramento Best Products store, SITE has designed a building that "calls for reductions as additions. A large, raw-edged notch will be removed from one corner of the brick-structure which serves as the main entrance, and also as a monument."

SITE, Inc.'s "Tilt Project" for a Southern California is the Best Products Company prototype, set in the middle of its requisite expanse of asphalt parking lot and surrounded by sea of conventional houses and commercial buildings. But one corner of the building's outer shell is dramatically jacked up—like (unnerving) product of an earthquake.
"The concept," according to SITE, Inc., "is a multiple inversion of the combined ingredients of strip merchandising—parking lots, acres of automobiles, and shoebox warehouses—based on the theory that these eyesores, although condemned by purist designers, are not in themselves bad; it is simply negative attitudes toward them that prevent interesting solutions.

by Edwin Slipek
Best Products Company, Inc.

In the early 1970s, the president and executive vice president of Best Products Company, Inc., scouted the greater Houston area with the intention of expanding their catalog showroom operation there.

The area did not lack for handsome retail establishments. But there was little in the commercial architecture of the city to keep one's attention or expand one's interest.

"It was our first experience in Texas, and we were impressed that each company had a spiffier and showier building than the next," said Frances Lewis, executive vice president, "but after we had left Texas and returned to Virginia, our company's headquarters, we could not remember which company had built which structure. This was particularly true of our competition."

It was then that they decided that Houston might be the perfect location to make an immediate impact, establish identity, and have some fun by engaging SITE, Inc., of New York City to design the facade of the new building.

SITE's first Best work
SITE had its first crack at a Best Products Company building in 1972, when it had been hired to redesign the facade of a showroom in suburban Richmond.

The unassuming red brick showroom had been open for a number of years and had been quietly swallowed up by the suburban commercial strip around it.

"After the building had been built, we thought 'Good grief, this is the perfect ugly public space. Let's get SITE to do something with it,'" said Mrs. Lewis.

SITE's first proposal for transforming the dreary structure called for a "floating" brick roof which would have been constructed over transparent glass mullions. But in order to carry out the construction, business operations would have had to be shut down, and so the design was rejected.

The solution that was accepted and built, without losing a single day of business due to construction, included a "peeling" wall (page 117). The facade gives the appearance of brick facing rolling off the supporting masonry wall.

Three years after completion of the "peeling" facade—in November, 1975—Best Products opened its Houston showroom in the Al-
SITE's solution here was to give the outer walls a crumbling effect. The building immediately gained notoriety as well as acclaim.

**Vending machine merchandising**

Although the SITE-designed facades are unique, the interiors of these showrooms are no different from those of some 40 other more conventional Best Products Company showrooms located in eight states. Most Best Products buildings contain some 64,000 square feet of floor space with roughly 70 per cent devoted to warehousing and 30 per cent to retailing. The warehouse occupies the entire second floor and a portion of the ground level.

The design of the sales floor varies little from showroom to showroom. The layout has been devised over the years to provide Best Products with what it considers the most accessible, efficient, and economical way to move customers into the building and serve them.

Best Products distributes over 2.5 million catalogs annually. These include more than 10,000 nationally advertised items—hard goods, primarily, like cameras, jewelry, housewares, appliances, stereos and other electronic equipment, toys, and sporting goods. Catalog distribution is concentrated in households and businesses in communities where Best Products showrooms are located. Thus convenient and immediate pick-up by the consumer is what makes the efficiency of the showrooms more important than they would be for a conventional mail-order retailer.

One sample of each product is displayed on the sales floor. After examining the sample, if a customer wishes to make a purchase, the merchandise is sent down from the second-floor warehouse—in the manner in which candy bars are sold from vending machines.

**But does SITE's solution sell?**

Have the unique SITE-designed buildings helped Best Products' sales? Yes, they have. Andrew M. Lewis, Best Products president, says: "Business increased significantly with the completion of the Richmond SITE design. And in Houston, sales exceeded our budgeted sales estimate by 40 per cent."

Lewis adds that he hopes the SITE-designed Sacramento building, scheduled to open in April of this year, will generate even greater results.

But, according to Lewis, equally important in the company's decision to incorporate novel design in some of its buildings is the hope that the structures are making a broader statement and a contribution to urban design. "We hope our buildings will stimulate citizens to discuss the very nature of art and architecture, function and form in buildings. Concern for the environment—visual and otherwise—is an increasingly important topic. "We do not think it necessary that business always portray itself as interested only in profits, with no sense of humor," he adds; "business must be willing to experiment sometimes, and to take risks. We hope that these buildings will help humanize those relationships between business and the consumer."

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Best Products' Sacramento store, now under construction, will be finished this spring.
What size solar heating system is economical for a house?

Donald Watson, AIA and Fred N. Broberg, P.E.

The practicality of solar heating for houses depends, first of all, upon climatic factors and anticipated cost of conventional fuels. The favorable locations are cold, clear climates where the heating requirements are high where there is ample winter sunshine—the higher the rate, the more practical are the high-capacity solar-heating systems.

Climate, too, is an important variable. Pittsburgh and Denver are both near 40° latitude, they receive quite different amounts of sunshine because of differences in sky cover, sky clearness, and altitude. And where Williston, North Dakota is much farther north than Denver or Pittsburgh, and has a much greater space-heating requirement, its sufficient winter sunshine makes it as viable a location for solar heating as Denver. Hartford was included as a representative New England city, with moderately high heating requirements, but only moderate winter sunshine availability.

In this article, the economics of six approaches to solar house heating are compared for these representative northern climates. For these economic evaluations, it was assumed that the additional costs of the solar systems were amortized over the life of a 20-year mortgage at 8% interest, and that savings in conventional energy are averaged for the 20-year period and divided into monthly-saving increments. Average monthly paybacks in the first table, and in the graphs that follow, are determined by subtracting monthly amortization costs from the monthly energy savings.

Systems range from domestic hot water, to window heat recovery, to space heating.

**Alternative A: Solar Domestic Water Heating.** A small solar collector area (two or three collectors) can supply a major part of the year-round requirement for domestic water heating. Solar domestic hot water equipment, now available from many manufacturers throughout the United States, imposes few if any restrictions on the building design.

**Alternative B: Window Heat Recovery.** An approach to solar heating that is often neglected is the utilization of heat gain from solar-oriented windows, skylights, greenhouses and sun rooms. Window heat, if collected, has the effect of overheating the sunny side of a building while the colder side still calls for heat. Window heat can be recovered, however, and more evenly distributed by an air circulation system that removes heated air from windows, sun rooms, and/or upper portions of the house and passes it through rock storage—in effect cooling the house when it is overheated during winter days and storing the heat for some nighttime carryover. Installation costs of windows are part of the normal house construction and rock storage can be built within typical foundations. Sun rooms or greenhouses

<table>
<thead>
<tr>
<th>MONTHLY PAYBACKS FOR SIX ALTERNATIVES</th>
<th>HARTFORD</th>
<th>PITTSBURGH</th>
<th>WILLISTON</th>
<th>DENVER</th>
</tr>
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<tbody>
<tr>
<td>% fuel increase</td>
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<td>0</td>
<td>8</td>
<td>12</td>
<td>16</td>
<td>0</td>
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<tr>
<td>ALTERNATIVE A domestic hot water</td>
<td>11 % sol</td>
<td>4</td>
<td>21</td>
<td>40</td>
</tr>
<tr>
<td>ALTERNATIVE B window heat recovery</td>
<td>24 % sol</td>
<td>-2</td>
<td>10</td>
<td>23</td>
</tr>
<tr>
<td>ALTERNATIVE C auxiliary solar space heating</td>
<td>18 % sol</td>
<td>-1</td>
<td>24</td>
<td>50</td>
</tr>
<tr>
<td>ALTERNATIVE D combined alternatives B and C</td>
<td>40 % sol</td>
<td>-4</td>
<td>31</td>
<td>69</td>
</tr>
<tr>
<td>ALTERNATIVE E large capacity solar 20% CA/FA</td>
<td>51 % sol</td>
<td>-24</td>
<td>15</td>
<td>57</td>
</tr>
<tr>
<td>ALTERNATIVE F large capacity solar 40% CA/FA</td>
<td>70 % sol</td>
<td>-41</td>
<td>6</td>
<td>58</td>
</tr>
</tbody>
</table>

Monthly dollar paybacks are tabulated for six different solar-heating alternatives for a 1200-sq-ft house in four different climates. The values were derived by subtracting the monthly amortization (over 20 years) of additional cost of solar equipment from the monthly savings in conventional energy, averaged for the same period. Energy assumed for conventional domestic hot water was electric at 4¢/kWh; and, for space heating, oil at 42¢/gallon. Systems range from domestic hot water, only, to large-scale solar space heating. CA/FA is the ratio of solar collector area to the "heated" floor area.
can gain solar heat without overheating the residence itself.

Alternative C: Auxiliary Solar Heating. Auxiliary solar heating, like window heat recovery, involves only a small investment for partial solar heating. As first suggested to the authors by Everett Barber, Jr., auxiliary solar heating is a system that uses the same components as a solar domestic water installation (Alternative A, above) adding only a few more solar panels to increase collection area, and a heating coil to pipe excess heat into the conventional space heating system. Other than increasing the size of domestic hot water storage slightly, no other heat storage or controls are involved, and thus installed cost and construction requirements are small. The control sequence used—whether to supply domestic hot water first with the excess to space heating, or the reverse—depends upon engineering decisions related to climate and relative fuel cost. In this article, the former control sequence was assumed.

Alternative D: Auxiliary Solar Heating and Window Heat Recovery. This option combines previous Alternatives B and C. If a window heat recovery system did not have the rock-type heat storage component, then it would be redundant to combine it with the auxiliary space heating system since both would provide space heating on sunny days only. However, with heat storage, the daytime heat recovered from the house can be carried over into nighttime hours.

Alternative E: Solar Space Heating with Relatively Small Collector Area. In this option, the collector area is held to less than 20 per cent of the heated floor area and thus imposes little constraint on architectural design while providing sufficient heat to a storage unit for partial carry-over. The solar panels also supply domestic hot water.

Alternative F: Large Capacity Solar Space Heating. This is the same as Alternative E, but with more collectors (approximately 40 per cent of the heated floor area). Of the solar alternatives compared, this option requires the largest construction cost but also contributes the largest percentage of solar heating.

In evaluating solar alternatives such as those just described, the architect and engineer must first of all assess their performance and their esthetic impact. But whether a particular approach is viable or not is determined by the projected energy-cost saving. Life-cycle costing is important to the economics of solar house-heating approaches; and, yet, it involves judgmental decisions about fuel cost increases that directly affect the relative economic merit of the various alternatives being evaluated.

High quality solar equipment was assumed in projecting system installation costs. The same building plan, a one-family 1200-sq-ft house, is used for the tables and graphs, with construction costs and present fuel costs assumed to be equal in all four locations. Housing is a good candidate for solar heating because of its steady demand for relatively low-temperature heating, including a year-round demand for domestic hot water, and generally detached or low-density construction which offers a large surface area exposed to the sun.

While cost and performance breakthroughs in solar technology can be anticipated, these are not considered in the estimates. The performance and costs of the solar equipment, and the installation costs used in the comparisons represent state-of-the-art estimates. The installation costs used are relatively high, compared to costs claimed by other sources, but the solar-system performance assumed in the calculations also represents high-quality solar equipment. Lower installation costs and lower system efficiencies appear to be directly related at this time.

The heating load of the house in the example is greatly reduced by following high-in-sulation standards, with the result that the total energy contribution of the solar heating systems is smaller (see graph at bottom of page 133). The solar heating payback would look better than the results reported if a higher heat loss due to poorer insulation characteristics were assumed.

The cost effectiveness of improved insulation standards is so apparent, however, that an architect or engineer would obviously use-saving techniques first, and then compare heating alternatives. The intent of the comparisons is to show what the relative economic merit might be of different solar approaches, and determine the factors to reduce fuel use.

The table at the top of page 134 illustrates the heating-load calculations of a single house design in the four location design heat loss ranges are in the range per cent less than average, reflecting higher insulation standards and reduced infiltration loss that good planning and construction achieves.

The table on page 131 shows the monthly fuel cost savings, less finance charges for each of the six alternatives for assumed fuel cost increases of 0, 8, 12, and 16 per cent. The negative numbers in the 0 per cent fuel escalation rate column show that if the fuel cost do increase in cost, the solar investment

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**The potential dollar savings (and optimum size of system) depend upon the cost of fuel and the amount of sun available**

Two series of graphs show how the savings from house solar heating in four different northern climates are affected by the relative costs of conventional energy sources (top), and by the extensiveness of the solar-heating systems (bottom).

Curves at the top show how increases in assumed cost of conventional fuel affect the economics of different-sized solar-energy systems. At the greater increases, the larger systems generally become more and more economical.

From the bottom series of graphs one can determine the optimum percentage of solar-system contribution (the curve peaks) for different assumed fuel-cost increases—0, 8, 12 and 16 per cent.

Climate is a very significant factor. Hartford, for example, has a moderately-high heating requirement, but only moderate sunshine. Pittsburgh is not as cold as Hartford, but has more cloudy days. Denver is colder than Pittsburgh, but its weather and altitude give it good sunshine. Williston, N.D. is near the Canadian border, but it gets a lot of clear days.

![Graph showing the potential dollar savings](image_url)
PITTSBURGH
Annual Fuel Cost Increase

PITTSBURGH

00

50

00

16%

Fuel Incl.

12%

0 80 100

50 0%

Solar

~cases does not pay back within the 20-
mortgage period. But, a projection of 8%
percent fuel escalation is the consensus of
private and government forecasts.

Alternative-cost systems may save more money
when climate is favorable and fuel expensive
in particular interest in the payback results is
the fact that the order of merit of the six alter-
atives does not follow the relative order of
initial cost. It varies considerably according
to climate and assumed fuel cost escala-
tion. For example, the large-capacity solari-
approach, Alternative F, is among the
most economical of the six choices at the
present time, even though it may rank highest
by environmental merit” by greatly reducing
dependence on nonrenewable and polluting
But if fuel escalation increases above 12%
percent per year, the economic merit of Alter-
D and E is highest in nearly every case,
not for Pittsburgh where local cloudiness
a large investment in solar heating still
active. And if escalation were to rise to

WILLISTON

Annual Fuel Cost Increase

Average Monthly Payback $

Average Monthly Payback $

WILLISTON

DENVER

DENVER

% Solar

% Solar

% Solar

Heat loss for a 1200-sq-ft Denver house built following conventional insulation standards is plotted in solid
curve Q_r_2 and following high-insulation standards, in solid curve Q_r_1. The comparative solar-heat contribu-
tion of a solar collector with an area equal to 20 percent of the floor area is plotted in the dash-dot curve
Q_a_2, and equal to 40 percent of the floor area, in curve Q_a_1. Although solar energy contributes more heat
proportionately to the house with conventional insulation, the investment, over-all, is not as cost-effective.
16 per cent, the largest-capacity system would yield the largest monthly payback. And though Alternatives A, B and C rank low when fuel escalation is above 8 per cent, the table on page 131 shows that when combined (Alternative D), and the escalation is between 8 and 12 per cent, this Alternative is the most economical option in all four of the climates. The top series of graphs on pages 132 and 133 shows the approximate crossover points of economic merit of various alternatives as a function of changing fuel escalation rates. The bottom series of graphs have the same data plotted in another format to show the optimum percentage of solar capacity for given installation and fuel costs.

The example is limited to a single, though typical, case—that of a house financed under conventional mortgage terms. The economics, however, look poorer than if compared with standard house construction, in which case the paybacks would appear more favorable. Installation and financing costs also depend on individual circumstances. Many individuals are able to undertake a solar installation on different financial terms than used in the example through low-interest building loans. Tax incentives are being considered on the state and Federal level that may further change current economics in favor of solar heating. System cost breakthroughs or performance improvements may result in more cost-effective solar installations. Finally, the calculation methods used are monthly averages and result in only general results. Nonetheless, the relative order or economic merit of the various alternatives shown in the example would not change.

The study takes a moderate, if not overly conservative, view of solar installation and fuel costs in order to represent the typical case for solar heating with the options that it presents now. The results, in fact, suggest that—in the almost certain event that fuel costs will increase—some sort of solar heating is justified in any northern climate. If only solar domestic water heating and auxiliary space heating systems were to find the place in the residential market, the increase in production of solar equipment would make possible substantial economics of scale which would lead in turn to lower costs for the larger capacity systems. Even now, a middle-range solution might be adopted—an incremental approach to solar heating in which a building is constructed with only a small solar installation at first, such as Alternates A through D, with provisions made in the design for adding more capacity in the future, as the economic variables change in favor of increased solar heating. Other factors that could help lower installation costs include “one-contract” supply, installation and servicing: solar building and equipment packaging; and various subsidized economic incentives. In any case, the need is obvious for close coordination between architect, engineer, manufacturer and builder to ensure that a solar installation is appropriate for a building in terms of climate, heat requirement and financing.

Solar heating adds a cost that can be recovered from savings in fuel

The top table lists the geographic and weather characteristics of four northern cities, and itemizes the heat-load characteristics of a 1200-sq-ft, well-insulated house located in each city. DHL is the heat loss of the house at outdoor design temperature. Yearly heating loads are given for domestic hot water, for space heating, and for the two combined.

The bottom table lists the areas of solar collectors (CA), sizes of domestic hot water tanks, the larger DW tank used for auxiliary space heating, and window areas (WA) for the assumed example. Storage (STO) is required for space-heating alternatives (except alternative C) and for window heat recovery.

The costs listed are the dollars required to pay for the additional cost of the alternative systems over that of conventional domestic hot water and space heating systems. The monthly cost is the additional monthly mortgage payment for 20 years at a finance charge of 8½ per cent.

Donald Watson, AIA, of Guilford, Connecticut has developed his practice largely to energy-conserving design since he completed the Westbrook Solar House, one of the first in New England to be built on the private market. He has since been involved in over 80 housing designs using solar energy, including projects for ERDA and HUI. His article, copyright © Donald Watson, is based upon a chapter from a new book, Designing and Building a Solar House, published by Garden Way Publishing, Charlotte, Vermont.

Fred N. Broberg, P.E., is an engineer with Hill and Rigan, consulting engineers, New Haven, Connecticut.
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PassWall® is an unsurpassed, complete system comprising an automatic, recirculating overflow gutter combined with a stainless steel backed-up by steel buttresses, it's a structurally stable pool wall containing a complete, pipe-hydraulic system - eliminating all meter piping.

PassWall® is suitable for installation in any climate! It will not crack, bulge, or leak. Fabricated entirely of 12-gauge, polished stainless steel, it requires neither coating for section nor any annual maintenance other than wiping. It is shop located and delivered to the job in long sections. Erection and installing are by factory-trained crews. Installation is completed quickly and accurately.

A recirculating overflow gutter is preferred system for competitive swimming. (It is a requirement for pools in which national meets are to be held.) Absorption of turbulence by the gutter makes such pools quieter and results in faster swimming times. And our recirculation duct removed from the gutter - an exclusive feature - offers greater surge storage capacity than all other systems.

PassWall® is a economical system, offering the latest in pool technology. You can now obtain all components for your pool from one source, with a single responsibility - the wall with recirculating flow gutter, a superior line of deck equipment, complete filtration items, chlorination and mechanical equipment, moveable bulkheads.

We've been manufacturing quality equipment for institutional and commercial pools for the past twenty years. When you specify Paragon, you'll be getting quality and reliability from a firm dedicated to excellence in design and manufacturing.

For further information, see us in Paragon's Architectural File 13-22, or call us. Area representatives who offer advice or assistance are located throughout the country.

Paragon Inc., People Who Care.
Building Street
Scantville, New York 10570
710-769-6221
710-572-2202

INTRODUCING THE
PASSWALL®
AUTOMATIC STAINLESS STEEL POOL SYSTEM!

Colonial Park Pool
640 Lin. Ft. of PassWall
16,400 Sq. Ft. of Pool Area

PassWall
Wall and Gutter Section.

FROM PARAGON:
20 YEARS OF MANUFACTURING
THE BEST IN SWIMMING
POOL EQUIPMENT.
Now there's a new way to design in fire protection for life safety in modern high rise and other buildings without intruding upon design aesthetics. Grinnell's new CLEANLINE® Recessed sprinkler is so unobtrusive, so trim and compact, once it's installed you'll hardly know it's there.

But don't let CLEANLINE's quiet good looks fool you. Beneath that attractive closure you'll find one of the most reliable sprinkler heads in the industry. When room temperature reaches a predetermined level, the attractive closure falls away, exposing the fast-response Duraspeed sprinkler. As a second predetermined temperature is reached, the sprinkler activates, distributing a uniform water spray to put down a fire.

The standard finishes available are satin chrome and white. CLEANLINE Sprinklers are also offered in a variety of finishes to match any decor. All metallic finishes are UL-listed.

There's a lot more to tell about CLEANLINE. For more information and complete specifications, call your nearest Grinnell district office listed in the Yellow Pages, or write Grinnell Fire Protection Systems Company, Inc., 10 Dorrance Street, Providence, Rhode Island 02903.
Screen-printed carpet has commercial applications

“Rectangle” is one of four geometric designs in the company’s “Watch-tower” commercial carpet line recommended for offices, stores and schools. Sixteen colorations are available. Wear and soil-hiding capabilities of the continuous filament nylon fiber combine with built-in static control. The ¼-in. gauge carpet meets requirements of HUD-FHA UM44C for Type I, III, Class 1 installations. • Armstrong Cork Co., Lancaster, Pa.

Page 301 on inquiry card

Gray is the keynote color of this 1977 fabric collection

Leathers, fabrics and carpeting in gray predominate in this group. Shown is “Saville Row,” a hard finished upholstery fabric in wool and cotton. The affinity between the company’s other new wool upholstery fabrics and carpets is often the loosely twisted heather-spun natural yarns used in both. Leather in the collection is very thick, heavy-weight and—in the case of “Rhino”—shrunken 25 per cent to exaggerate the wrinkles and natural folds of the skin. Colors range from ivory to russet to gray. The company has introduced wall fabrics in 100-in. widths to minimize seaming: sandy textures, heavy quilting and linen weaves. • Jack Lenor Larsen Inc., New York City.

Page 302 on inquiry card

more products on page 143
Holophane lenses.
We make over 30 so you'll have the right one for any lighting situation.

There are no pat answers when it comes to lighting. Each project has its own set of requirements. That's why Holophane® offers you more than 30 different lenses.

We offer the right lens for classroom lighting, store lighting, low glare lighting, wall lighting and dozens of other specific applications.

Every injection-molded clear acrylic Holophane lens delivers tailored light distribution and high efficiency for energy-conscious installations. All wrapped up in a very attractive package.

Learn more about energy-efficient lighting solutions from your local Holophane representative, consult Sweet's or write: Johns-Manville Sales Corp., Holophane Div., Dept. AR-3 Ken-Caryl Ranch, Denver, Colorado 80217.
HOUSING

-HEATING/ CARPET FIBERS
A carpet fiber meets various contract specifications given in a illustrated booklet. A portion of oach considers routine maintenance and cleaning; a chart lists procedures for the removal of more than 60 different types of spots and stains on合同 installations. • American Cyanamid Co., Fibers Div., Wayne, N.J.

CIRCULAR GUIDES
-ALUMINUM HEATING/ CARPET
-ALUMINUM FLOOR
-ALUMINUM DOORS
-CONSTRUCTION CASTINGS
-TOOLING GUIDE
-RETE CURING COMPOUND
-CEMENT HARDWARE
-LAMINATE FILMS/FABRICS
-RESILIENT FLOORING
-UNDERFLOOR PLENUM
-CONSTRUCTION CASTINGS

-Exterior Coatings
THE results of a manufacturer-sponsored program intended to produce useful guidelines for the selection of cost-effective coatings for buildings are given in a test report. Inorganic and organic coating systems were tested by three independent research firms, using ASTM and other test procedures, over a two-year period. Architectural wall finishes are graded according to their resistance to color change, airborne pollution and contaminants, humidity, and the abrasive effects of airborne particles. • H. H. Robertson Co., Pittsburgh, Pa.

-Prismatic (7276) lens is ideal for stores. The sparkling lens says: “We’re open.”

-Wall-Lite™ (6044) lens provides uniform illumination for vertical surfaces from a single fluorescent lamp.

-Percepta™ (6200) is a wraparound lens that features special twin-beam light distribution to control veiling reflections. Excellent for classrooms and offices.

-Refractive Grid™ (8224) low-glare lens reduces high angle brightness up to 70% over cone prism lenses. Features excellent light utilization.

-Prismaticwrap™ (7100 series) lenses use six different prisms to redirect glare rays into useful zones. Excellent light utilization and very wide spacing ratios. Good for use in schools.

-Holophane lenses for precise light control.

Here are five of our most popular lenses. Each is the finest available for its respective task. Plus, each is injection-molded of clear acrylic for strength and efficiency.

Johns-Manville
For more data, circle 61 on inquiry card
Only a 100% THERMAFIBER® fire safety system is 2000° sure!

THERMAFIBER Mineral Fireproofing for columns and beams goes on clean, fast, and dry. Contains no asbestos. Cleanup is minor. Damage is easily repaired. No temporary heating during installation.

THERMAFIBER Safing Insulation protects at the intersection of floor slab and curtain wall while THERMAFIBER Curtain Wall Insulation backs spandrel panel assemblies.

It doesn’t take a disaster movie to call attention to the life-or-death importance of fire-stopping. Or to remind you of the energy-saving values that a fire safety system contributes. But only one material satisfies both fireproofing and thermal values efficiently. That material is THERMAFIBER mineral fiber. When subjected to the ASTM E119 Time-Temperature Curve, THERMAFIBER did not melt or disintegrate. All other materials tested disintegrated in from 2 to 14 minutes at temperatures from 550°F to 1375°F. Thus, to get THERMAFIBER protection, you cannot mix other materials in the system. Only an all THERMAFIBER system provides such performance. For detailed information and research figures, write to us at 101 S. Wacker Drive, Chicago, Ill. 60606, Dept. AR-37

UNITED STATES GYPSUM
BUILDING AMERICA

For more data, circle 62 on inquiry card
WOOD INSULATING WINDOWS / Designed for cold weather area use in multiple-housing construction, these Perma-Shield window units feature removable storm panels installed over double-pane insulating glass. The panels are said to improve insulation effectiveness more than 35 percent over double-pane glazing alone. Windows are constructed with a rigid vinyl sheath over preservative-treated wood core sand and frame; weather-stripping is factory-applied. These triple-glazed units are available in Perma-Shield casement, awning, and double-hung windows, as well as some primed wood units. • Andersen Corp., Bayport, Minn.

Circle 308 on inquiry card
For more products on page 145

ELECTRIC-EYE FAUCET / Using a photo-sensitive beam to regulate water flow, Aquatron 12-volt DC solid-state sink controls let water flow when hands interrupt the beam; water stops automatically when hands are removed from the beam. The unit can be included in new sink installations or used to convert existing units. Aquatron features preset water temperature and adjustable pressure regulation when used in conjunction with a hot/cold mixing valve; the electric eye is not affected by sunlight or room lights. The device fits any sink, and is said to be easy to install and economical to operate. Suggested applications include public rest rooms, restaurants, health care facilities, etc. • Qualico, Los Altos, Calif.

Circle 307 on inquiry card

The Key to Power-Strut’s Grid Ceiling Support System

Easily moved internal panels allow for seasonal expansion or contraction
Adjustable track lighting fixtures hidden by baffles, spotlight merchandise
Hanging baffles hide open ceiling, electrical and mechanical equipment
A criss-cross grid of Power-Strut continuous slot channel is hung from unfinished ceiling or building’s steel structure

CR-304

CK-MOUNTED PANELS / Permanent track, ceiling mounted in a modular grid pattern, holds individual “Divisiflex 301” panels, which can be arranged to form partial space barriers or complete walls. A “puck” suspension system permits panels to slide out of track, including right angles, in the track or out special adapters or switches. Seals at both top and bottom of each panel complete the closure for floor to ceiling, and act to reduce noise transmission. The panels are said to move easily, and can be arranged without custodial help. Panels may be used in textured vinyl, chalkboard, and sound-absorbing banquet. • Modernfold, New Castle, Ind.

Circle 305 on inquiry card

A unique concept in functional esthetic effects...

The Power-Strut Modular Grid Ceiling Support System is simple in design and easily installed. A criss-cross grid of Power-Strut continuous slot metal framing is hung from the rough unfinished ceiling or the building’s steel structure. Decorative baffles or fins are hung vertically from this grid. The decorative baffles hide all mechanical, heating and cooling ducts, sprinkler systems, etc. Adjustable “track” lighting spotlights merchandise displays. Since walls and divider panels are easily attached to the grid, seasonal or department expansion or contraction can be reduced to an overnight project.

For more information write...
VAN HUFFEL TUBE CORP.
WARREN, OHIO 44841

Circle 306 on inquiry card
For more data, circle 63 on inquiry card

Hiteprinter/Blueprinter / The “Econojet” copier is said to combine a small per-copy cost with high quality printing and developing. Copier issues 9- by 60- by 12½-in., and can be used either on a desk-top or wall-mounted. The unit has a maximum speed of 9 ft per minute, and a printing width of 42-in. by any length. “Econojet” copiers meet all OSHA standards. • Teledyne Rotex, Stirling, N.J.

Circle 306 on inquiry card
MORE IS LESS.

Get the extra protection of a fluoropolymer coating at significantly lower cost. With DURANAR® 200 coatings.

It's as easy as PPG.

More protection at less cost—that's what you get with DURANAR 200 coatings. And that's what you'll find on this Montana power plant—DURANAR 200 coatings on siding and roofing panels of pre-coated Reynolds Aluminum.

The more-for-less secret is twofold:
First, DURANAR 200 coatings are based on KYNAR® resin to give you long-life fluoropolymer protection. You know how tough that is.
Second, PPG's patented combination of resins (U.S. Patent #3449466) gives you that fluoropolymer protection at a cost significantly lower than other fluoropolymer coatings.

And exactly what does a DURANAR 200 coating give you? It gives you a surface that's virtually maintenance-free, with beauty, durability, and color integrity that last for years. It's extremely flexible, extremely color-fast, extremely resistant to UV erosion. It's a two-coat system that can be applied to aluminum and galvanized steel, available in a wide range of colors in flat and semi-gloss finishes. And its color compatibility is excellent even with long-span and adjacent surfaces.

For all the details, write to Tom Keeling, Market Manager, Coil Coatings, PPG Industries, Inc., Pittsburgh Drive, Delaware, Ohio 43015. Or call him at (614) 363-9610. More is less with DURANAR 200 coatings. So get yourself more. For less.

PPG: a Concern for the Future

For more data, circle 64 on inquiry card

DURANAR 200 is a registered trademark of PPG Industries, Inc.
*KYNAR is a registered trademark of Pennwalt Corporation.
RAL FIBER FLOORCOVERING / A grass-type carpet, "Ribbed Aloe," is woven in Belgium in both a 4-meter-wide ribbed weave (shown), and a single-ply flat weave in 2-meter widths. The natural-fiber, bone-colored carpet is to have excellent acoustical properties; its latex backing should simplify installation on wall or floor. • Saxony Carpet Co., Inc., New City.

Circle 309 on inquiry card

TOOL / A new addition to this manufacturer's contract seating collection, the "Lisa" stool has a beech wood frame with cylindrical legs in a buffed finish. The slung seat is of natural saddle leather. Bar stool is 37½-in. high, 15-in. deep, and 17½-in. wide. • Intrex Inc., New City.

Circle 310 on inquiry card

T HINGE / This reinforcing pivot hinge is designed to transfer excess opening force on frequently used doors through the pivot into the jamb. This action is designed to reduce hinge wear and sagging, and improperly closing doors. Pivot hinge is easily installed, and units are available for both full-surface and half-surface applications, with 3¼-, 4-, 4½-, and 5-in. hinges. • Hinge Co., St. Louis, Mo.

Circle 311 on inquiry card

TING FIXTURES / Said to be appropriate for accent lighting in retail stores, restaurants and theaters, as well as for residential use, these "Small Bullet" fixtures are available in three styles. All can be wall-, ceiling-, or stem-mounted, and come either single or double fixtures. Four finishes are available: satin aluminum, satin brass, matte white or black. • Kosman Lighting Equipment Co., San Francisco, Calif.

Circle 312 on inquiry card

TING TIMESAVER / A transparent, pressuresensitive adhesive backed sheet, Typiton vellum has a special finish that will take a clear, reproducible impression from a standard typewriter. A draftsman need not stencil or handwrite title blocks, texts, etc. These can be typed directly onto Typiton using an appropriate typeface; the backing is peeled off; and the clear sheet with the text material is bonded on the drawing. Repetitive details, dia­grams, or other drawings may be reproduced from master directly onto Typiton sheets using repro­nic copiers. In either case, copies of the com­pleted drawing are said to appear as though the text or painted detail has been drawn directly onto the final. • American Corp., Hamden, Conn.

Circle 313 on inquiry card

For more data, circle 65 on inquiry card
SPACESAVER
SAVES
SPACE

• TURN WASTED AISLES INTO USABLE SPACE
• SAVE 50% OF PRESENT SPACE OR ADD 80% CAPACITY IN THE SAME SPACE

Space for storing 240,000 X-ray procedures is provided in this hospital installation.

Long expanse of face panels offers excellent design possibilities. Wide variety of materials and colors available.

Where special security is required, system may be designed to roll together and lock when not in use.

WRITE FOR FREE ILLUSTRATED BROCHURE

SPACESAVER CORPORATION
1450 JANESVILLE AVE.
FORT ATKINSON, WIS. 53538
414-563-6362 OR 608-868-7550

For more data, circle 66 on inquiry card

CONTRACT WALLCOVERINGS / Eleven murals and three companion repeat patterns are included in this wallcovering collection. Designs generally offer small- and large-size figures on 10-ft backgrounds; materials include asbestos-backed stainless steel, buckskin, suede and patent vinyls, and mylar. Pattern pictured above is “Fraility,” a mural-repeat. • The Jack Denst Designs, Inc., Chicago, Ill. Circle 314 on inquiry card

WICKER CONTRACT FURNITURE / The 84-in. sofa and 60-in. love seat pictured are part of the “Gallery Wicker II” collection of furniture for commercial and residential use. Also included in the line are armless chairs, ottomans, and a corner seating unit. The pieces have double-walled woven wicker frames mounted on recessed hardwood stretchers bases: Dacron-filled seat and back cushions are removable. Designed by John Wisner, the “Gallery Wicker II” line is available in several natural brown tones, and an assortment of bright lacquer finishes. • Ficks Reed Co., Cincinnati, Ohio. Circle 315 on inquiry card

WALLS PANELS / “Panelcarve 1400 Series” features a geometric design theme displaying a variety of shadow effects on carved wood. The 1-in.-thick panels are available in 9- by 36-in., 9- by 48-in., and 9- by 96-in. sizes; a tongue-and-groove edge detail is said to permit easy assembly without surface nailing. Wall panels are all-heart vertical grain redwood, in several finishes. The “1400 Series” may also be ordered in Honduras mahogany, oak and other hardwoods. • Forms and Surfaces, Santa Barbara, Calif. Circle 316 on inquiry card

More products on page 149

ARCHITECTURAL RECORD March 1977

About the only way to pick the New Emhart High Security Locking System is to select it.

When you specify a lockset incorporating the new Emhart High Security Locking System, you have the key to positive building protection in your pocket. The odds against a would-be intruder beating the system are astronomical!

It’s designed so that angular cross-cuts in the key bit rotate multi-section tumbler pins a precise number of degrees. This line up T-slots in their upper ends mating projections in their upper sections to activate the cylinder. Considering the possible combinations of angles of rotation in the 6-pin cylinder, it’s virtually impossible to operate without the key. Russwin will custom build high security package to your with a fine quality lock and the Emhart High Security Locking System. Emhart System keys can also operate other selected Russwin locks, permitting the use of conventional locksets for normal security plus Emhart System locks in critical areas, all operated with one key. The System’s cylinders may also be imposed on new or qualified locking systems.

Write to Russwin for complete details on the high security system with more angles than any burglar lock.

HARDWARE DIVISION, EMHART INDUSTRIES, INC.
BERLIN, CONNECTICUT 06037

For more data, circle 69 on inquiry card
About the only way to pick this lock is to select it.

Emhart High Security Locking System. A major advance in positive protection for buildings that breaks dramatically with traditional lockset design. Unique cross-cut key bit* and interlocking tumbler pins create astronomical odds against picking.

DirMo II Design. Other designs and functions available tailored to your security and styling needs.
When you need hundreds of windows on a very tight schedule, start by specifying a very good window.

The bigger the project, the more you need to be sure of the windows. We've furnished windows like these Casemasters for projects requiring several thousand units. The Casemaster is beautiful, rugged, easy to operate, and tight. These are some of the reasons they get specified. Another is that Marvin can deliver big numbers of windows on a tight schedule, including prefinished units set up and ready to go into the opening. Write for complete information on these and other fine Marvin units. Marvin Windows, Warroad, MN 56763. Phone: 218-386-1430.

Marvin Windows
Mumford's complete writings for Architectural Record are now collected together in definitive volume. These 24 important spans 50 years of the career of America's most architectural and social critic, and the wide scope of concerns that have moved Main Mumford a unique place among the thinkers of the 20th century. The writings are arranged within one volume.


A range of problems now facing Americans and our built environment as a whole are forseen by Lewis Mumford long before they became national issues. Mumford's prophecies are now more timely than ever, and the solutions he suggests are as timely. From mass-produced housing to transportation, from urban planning to towns, from the death of the city to the death of Megalopolis, the crucial problems of the day are discussed in depth in this one volume.

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**PRODUCT REPORTS continued from page 146**

**VERTICAL LIFTERS** / Electric-powered vertical lifting platforms do not need a pit for either portable or stationary installation. The freestanding lifters are constructed in sections, and can be quickly installed in existing buildings, according to the manufacturer. Capacities and lift heights range up to 50,000 lbs and 60 ft. Units are powered by electric hydraulic or cable drive; either power option can be mounted inside the framework, or at a remote location. Platforms are supplied with fixed or removable pipe rails, hinged or upridding gates, side thrust rollers compensate for uneven loading of the platform. Suggested applications include freight handling, dock loaders and levelers, mezzanine service, etc. • Giant Lift Equipment Mfg. Co., Everett, Mass.

Circle 317 on inquiry card

**WOODGRAIN LAMINATE** / “Jacobian” is a parquet pattern of medium and dark toned woodgrain “blocks,” available in both general purpose “H-5” and postforming “HF-5” grade high-pressure plastic laminates. The laminate surface is suitable for a variety of residential and commercial applications, including cabinets, doors and commercial fixtures. • Exxon Chemical Co. U.S.A., Odenton, Md.

Circle 318 on inquiry card

**DIAZOPRINTER** / Model “12FL” fluorescent, table-top diazoprinter features a negative-pressure developer tank for reversible operation, and provides full domestic and international size capability with a 4½- in. printing width. Synchronized printing and developing is said to ensure processing of long prints without damage; solid-state controls provide repeatable speed settings to 15 ft per min. • GAF Corp., Reprographic Products, New York City.

Circle 319 on inquiry card

**LANDSCAPE FURNITURE** / “Wood-Ware 20” is a series of modular area landscaping blocks, which include lighting, benches, planters and graphics. Units are constructed of either rough-sawn or smooth-surface cypress, redwood and choice of signage and logo graphics. • Street Lighting Equipment Corp., Woodside, N.Y.

Circle 320 on inquiry card

**WINDOW BLINDS** / Colors featured in the “Til-tone” line of 1-in. window blinds may be specified on either the top (convex) or bottom (concave) side of the slat; the other side will be white. This option permits the use of bright colors and stripping on the side of the blinds that normally face interior spaces without affecting the uniform exterior appearance. • Levolor Lorienten Inc., Hoboken, N.J.

Circle 321 on inquiry card

For more data, circle 69 on inquiry card
FULLSPACE...
the file with the movable aisle!

If you tried to provide your clients with this much storage or file space using ordinary files or shelves, you’d need 6 aisles and up to 4 times the floorspace. FULLSPACE does it with just one aisle that opens where it’s needed. Furthermore, when the aisle is opened, all the space on both sides is exposed, greatly reducing access time.

But there’s more to FULLSPACE than space-saving and efficiency. High quality finishes in handsome wood grains or colored laminates create handsome furniture that complements any decor.

Want more information? Write today, or call us collect.

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Jacksonville, IL 62650
217/243-8585

General Services Administration • FSC Group 71, Part V, Section C

For more data, circle 70 on inquiry card
When you want a small package delivered fast, it's in the bag.

Delta's DASH guarantees delivery on the flight or routing you specify between all Delta cities and most cities served by other airlines through interline agreements. Packages accepted up to 50 lbs. with length plus width plus height not to exceed 90".

Call Delta for an expedited pick-up, or bring your package to Delta's passenger counter at least 30 minutes before scheduled departure time (or to the air cargo terminal at the airport 60 minutes before schedule departure time). The package can be picked up at the DASH Claim Area next to the airport baggage claim area 30 minutes after flight arrival at destination. Or we deliver it at an additional charge.

Delta reservations can give actual DASH charges between specific points. You may pay by cash, company check, most general-purpose credit cards, special credit arrangement or, on government shipments, by GBL.

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<th>Rate examples</th>
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For details, call Delta reservations.

For expedited pick-up and delivery at extra charge, call 1-800-434-0492 toll free any-where in the Delta system. In Washington, D.C. call 466-3131.

Delta is ready when you are.

For more data, circle 73 on inquiry card

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**PRODUCT REPORTS continued from page 149**

**LIGHTING KIOSK** / Constructed of molded reinforced fiberglass, these freestanding units can be used to provide indoor or outdoor lighting in malls, parks, etc., and to display advertising. Other models, with doors and windows, may be used as self-contained selling centers or information booths. Kiosks are available in heights of from 5- to 10-ft. and diameters of 2- to 6-ft; over a dozen colors are offered for both top and bottom sections. Individual units are constructed from two parts: internal flanges on the top piece fit into the base for nut-to-bolt assembly. Completed kiosks are said to withstand wind loads of 100 mph.

- Visual Products Co., Melville, N.Y.

Circle 322 on inquiry card

**PUSH BAR EXIT** / This mortise exit device can be readily adapted to many narrow stile glass doors and metal frames, according to the manufacturers of the "8400 Series" life safety push bar. The bar itself is 2½-in. wide by 30-, 36-, 42-, or 48-in. long. Non-standard door sizes can be accommodated by shortening the next larger bar. The latchbolt is operated by a 1-inch straight travel, rather than a downward arc; normal unloaded release pressure required is 8 lbs. Standard finishes are satin aluminum, and bronze or black anodize.


Circle 323 on inquiry card

**WASHROOM PARTITIONS** / Low maintenance costs are claimed for these prefabricated crystalline marble interior partitions for washrooms, shower stalls or dressing rooms. Marble partitions resist moisture, odors and stains; compartments include chrome-plated brass hardware and are available with either red oak or birch veneer doors. Units designed for the handicapped feature out-swinging doors and grab bars on each side partition.


Circle 324 on inquiry card

**UNIT HEATERS** / These wall-mounted forced-air unit heaters may be ordered in capacities of 2000 to 5000 watts; heating elements are all-steel finned sheath type. The front grille is designed to withstand heavy impact abuse and vandalism; a "Zero Voltage Reset" thermal cut-out provides protection if normal operating temperatures are exceeded. The "3420" and "3450" series heaters offer several factory-installed control systems, including hydraulic-type thermostats; relays for remote pilot duty control or time clock night set-back programs; and built-in circuit breakers for multiple heater hook-up to feeder and feeder taps.

- Markel Electric Products, Inc., Buffalo, N.Y.

Circle 325 on inquiry card

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**SOUND SECURITY**

4147 Ravenswood Ave., Chicago, Ill. 60613

For more data, circle 74 on inquiry card
TAKE A GOOD CLOSE LOOK AT CEM-FIL® AR GLASS FIBER, GLASS REINFORCED CEMENT...

IT’S THE SHAPE OF THINGS TO COME.

GRC (Glass Reinforced Cement) is the building material of the future. And it is here today. In fact, Cem-FIL AR Glass Fiber is the real deal. GRC is a practical reality. It's the first and fiber extensively field tested and proven fire resistant.

This label is your guarantee of GRC integrity. It assures that Cem-FIL AR Glass Fiber has been used as the reinforcing agent in the product that bears it. It also implies the high degree of GRC technology and quality control in the manufacturing process. This label is found only on GRC products incorporating Cem-FIL AR Glass Fiber, available from a growing number of licensed GRC producers.

A Few New GRC Applications:

#1—Cladding

#2—Cladding

#3—Lost Form Work
Large waffle floor pans of GRC were used to form the five floors of this brewery building.

#4—Interior Decor
GRC ceiling units installed in shopping center GRC specified in place of plastic for non-burstibility and fire resistance.

#5—Acoustic Hood

If you'd like to know more about GRC, its applications and its availability, write or call:

Cem-FIL CORPORATION
Two International Plaza Drive
Nashville, Tenn. 37217
(615) 361-4564
Telex 55-5129

When you specify GRC products, specify GRC reinforced with Cem-FIL® AR Glass Fiber. There is no equal.
FIRE PROTECTION EQUIPMENT / An extensive line of fire extinguishers; modular cabinets for hoses and valves; standpipes and connectors are shown in a 32-page catalog. Featured is a cabinet identification device in which the one-piece cast handle has raised brushed finish letters spelling “FIRE,” eliminating the need for decals or signs that can be removed or damaged. • J. L. Industries, Bloomington, Minn.

Circle 415 on inquiry card

RADIANT HEATING / An eight-page construction guide provides design and installation instructions for the PAN Electric ceiling radiant heating units, intended primarily for homes and low-rise apartments. • Gold Bond Building Products, Buffalo, N.Y.

Circle 416 on inquiry card

PORCELAIN-ON-STEEL PANELS / A 16-page catalog describes interior and exterior applications for insulated porcelain-on-steel panels, giving installation instructions, specifications and recommended core materials. Another section is devoted to uninsulated panels for interior and exterior use, with photographs of panels in manufacturing plants, clean rooms, hospital laboratories and elevators. A final section deals with “Vitiform 90,” a procelain-on-steel material that can be formed—with the porcelain already on it—at angles up to 90 degrees without spalling, chipping or crazing. • AllianceWall Corp., Wyncote, Pa.

Circle 417 on inquiry card

PROTECTIVE COATINGS / A coating systems guide details selection, preparation, and application of protective coatings for floors, stairways and steel decking in industrial and commercial facilities. Coatings designed to resist foot traffic, severe abrasion, chemical spills and constant washing are discussed. • Rust-Oleum Corp., Evanston, Ill.

Circle 418 on inquiry card

WOOD FRAMING / A series of six folders discuss specific ways to lower wood framing costs in residential construction. Detailed plans illustrate such suggestions as correlating lumber spans to standard lengths; permitting the use of thicker insulation by framing with 2x6 studs at 24-in. intervals; and utilizing the full span capabilities of lumber. • Southern Forest Products Assn., New Orleans, La.

Circle 420 on inquiry card

SILICONE/URETHANE FOAM / The advantages of “3-5000” silicone rubber/urethane foam roofing and insulation system are given in an illustrated brochure. • Dow Corning Corp., Midland, Mich.

Circle 421 on inquiry card

GARAGE DOORS / Six door series are covered in this 24-page industrial and commercial catalog: steel, fiberglass, combination steel/fiberglass, wood panel, wood flush, and aluminum. Specifications include construction details, track, spring counter balance, lock options, weather seals, and wind load data. • Raynor Mfg. Co., Dixon, Ill.

Circle 422 on inquiry card

For more data, circle 76 on inquiry card

For more details, contact: Mr. Ralph Robinson
President, Mo-Sai Institute
P.O. Box 685
Edmond, Washington 98052

For applications illustrated on opposite page.

Concrete Co., Main Street
P.O. Box 685
Edmond, Washington 98052

Jackson Stone Co., Inc.
P.O. Box 5388
Jackson, Mississippi 39216

Olympian Stone Co., Inc.
P.O. Box 685
192nd N.E. & Union Hill Road
Redmond, Washington 98052

Southern Cast Stone Company, Inc.
P.O. Box 1689
Sutherland Ave. & Concord St.
Knoxville, Tennessee 37901

Wilson Concrete Co., P.O. Box 56
Red Oak, Iowa 51566

P.O. Box 729
South Omaha Station
Highway 75 Avery Rd.
Omaha, Nebraska 68107

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THE Stemwinder

OFFICE LITERATURE continued from page 141

... or, how about BLISTERED, ROPY, LEAFY, CREAMY SWISS or PLUM PUDDING?

Each of these words describes a specific pattern or color of a specific species of wall paneling wood veneer.

Quilted, blistered and plum pudding all describe presentations of beautiful Honduras Mahogany. Ropy refers to quartered Acacia. Leafy grained Butternut is uniquely attractive, and more than one designer believes that creamy Swiss Pearwood is the ultimate.

And these are just a few. That's why there really is no reason to settle for ordinary wall paneling.

FLITCH SPECIFICATION. There may be times when simply specifying stock wall paneling is inadequate—times when you wish to more precisely express your client’s own individual taste. The flitch specification process—plus Stem’s bold inventory of woods—allows you to do just that. You handpick the veneer that best meets your aesthetic criteria for color and grain patterns. We welcome your inquiry.

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WALL PANELING?

CHESTER B. STEM

President

Let’s face it: only wood is wood.
### The All-New 1977 Calendar of Historic Architectural Event

The 1977 Architectural Calendar is better than ever! It is all new — 365 more historic events in architectural history and 13 more stunning architectural photographs by award-winning photographer G. E. Kidder Smith, FAIA. And, for the first time, this year's calendar is designed to be used as a write-in calendar as well as a wall calendar! They said it couldn't be done, but the 1977 Architectural Calendar continues its daily commemoration of memorable architectural events... famous figures in architecture and engineering... births and deaths of world's greatest architects and engineers... significant, amazing and little-known facts that inform and surprise even the most knowledgeable... 

- The day Palladio was fined for absenteeism from the construction site
- The day the Parthenon was "rediscovered" during the Renaissance
- The day that Latrobe complained that architecture wasn't a profession for a gentleman
- The day Michelangelo began painting the Sistine Chapel
- The day Thomas Jefferson insured Monticello—for $6300
- The day Inigo Jones loaned his client (and King) £500
- The day the Congressional Medal of Honor was awarded to a famous American architect
- The day Disneyland opened

... these and hundreds of other bits of history make the 1977 Architectural Calendar a valuable source of architectural knowledge and a true collector's item.

Illustrated with 13 beautiful, full-color photographs illustrating the architectural heritage of the United States, this calendar makes a handsome and decorative addition to your home or office and would make a much-appreciated (and inexpensive) gift. The strikingly designed calendar is printed on luxurious enamel stock in an oversized, 9x12" format. Only a limited number of calendars are being printed this year, so in order to avoid disappointment, order today! Send your payment for $5.00 to Architectural Record Books, 1221 Avenue of the Americas, 41st Floor, New York, N.Y. 10020, or use the handy order blank below.

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Please send me ______ copies of *The 1977 Architectural Calendar* @ $5.00 each. Add sales tax where applicable.

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The custom sill convectors for your next job are ready

and waiting for you at Markel. Because for the first time, you can specify convectors that have the custom look, but are standard items. It’s called the Markel 4600 series. These artfully designed convectors let you choose a style and size without sacrificing the integrity of your design. At the same time, you’re selecting highly efficient convectors that respect the integrity of your client’s budget. The 4600 system is a unique blend of form and function with no compromise to either. You can combine variable heat densities, inactive areas and controls in one monolithic enclosure. Inconspicuous seams permit infinite lengths. A wide selection of configurations allows you to give each area the type and amount of heat required. Vinyl coated, textured and stainless steel finishes available. Colors can be produced in exact matched shades. Markel 4600 sill convectors. They’re aesthetically pleasing. Have uncommonly low prices. Available when you need them. And are designed so everyone will think they were custom made.

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The electric heating company
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Phone 716/875-7660, Telex 91-233

For more data, circle 77 on inquiry card
'Shop Talk' 27th International Design Conference in Aspen
Sunday, June 12 through
Friday, June 17, 1977

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Julian Beinart
Milton Glaser
(Saul Bass
Ivan Chermayeff
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Jack Roberts
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George Nelson
M. Paul Friedberg
Richard Saul Wurman
Saul Bass
Jivan Tabibian
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Ralph Caplan
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Moshe Safdie
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John Tyson

Shop Talk participants from abroad will include:

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John Tyson

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Shop Talk will be an unusual week devoted to
discussion, demonstrations,
and close examination of
what today's designers
think, do, and feel in
various stages of their
professional lives.

The Conference leaders—
practitioners from the
IDCA Board of Directors
representing diverse
disciplines within the
design field—will be
joined by ten leading
designers and architects
from abroad.

Registration is by
mail only, do so early
as space is limited.
Your cancelled check
is your confirmation.
Deadline is May 29th.

Fees: $150 Registration
$100 Companion
$50 Student (proof required)
$50 Children
(per child, 6-12 years)
Fee covers access to all
conference programs
and literature.

Temperature range is
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Bring warm clothing
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☐ $150 Registration
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There is a $15 handling charge
on cancelled reservations.

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persons being registered
must be listed.

Name
Address
City, State
Zip Code
Occupation

Children's Program
Limited to 50
Name and age of each child
Other child care is available
Question:
Should an architect have to do the laundry?

Answer: No way. Instead, feel free to call on Econ Systems for everything your client needs in a well-planned, on-premise laundry. You could come out a hero. Because we can often help you point to a 30 to 40 percent cost saving, compared to a contract laundry situation. This represents a continuing operational saving for your client.

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So you see—having Econ Systems do your laundry could be just the ticket. Next time, give us a call at our toll free number: 800-238-5557. For a free copy of Econ Systems Engineering and Architectural Specification Manual, write Econ Systems, a division of Economics Laboratory, Inc., 4 Corporate Park Drive, White Plains, New York 10604.
If you would like to know more about this subject, write on your letterhead for our new booklet: "Galvanized Reinforcing Bar—Undercover protection for concrete."

Galvanizing — the metallurgical bonding of zinc into steel — has proven its ability to protect rebar against rust before, during and after installation. This is recognized in the revision of General Services Administration guide specification PBS4-0344.01 as follows: When concrete cover on exterior surfaces is less than 1' inches, reinforcing bars and mesh shall be zinc coated...in accordance with ASTM A-123.
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Space Beautiful

for homes, churches, commercial and institutional structures.

Lock-Deck is a superior laminated decking designed by Potlatch to free the outer limits of your imagination and work with you to make space beautiful in a variety of ways.


The textural qualities and subtle color tones allow the designer to uniquely personalize his plan. A broad range of acrylic stains on wire brush, smooth, or saw textured surfaces are available for your selection.

And, Lock-Deck's strength to weight ratio offers the kind of structural freedom that allows the designer to create imaginative structures as diverse as church and home.

So if you're interested in making space beautiful through free play of the design imagination, contact the Western Wood Products division now.

Potlatch Corporation
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(509) 455-4260

For more data, circle 79 on inquiry card.
Coming in mid-May

Architectural Record's Idea Annual of the Housing Field

RECORD HOUSES AND APARTMENTS

In mid-May Architectural Record's Record Houses and Apartments offers a timely opportunity for manufacturers of quality building products to exert year-in and year-out influence on those architects and builders who are at the forefront of the housing market.

It reaches all major groups of specifiers and buyers in this market:
- Some 45,000 architects and engineers—who are verifiably responsible for 87 per cent of the dollar volume of all architect-planned residential building.
- 20,000 of the nation's foremost builders—qualified by Sweet's on the basis of annual building activity to receive the Light Construction Catalog File.
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For more data, circle 80 on inquiry card
Today's building will live its life in a different world. Life costing (rather than initial construction economics) become a primary concern. This means that thermal considerations must receive more and more emphasis in architectural design. Building materials will need to play an integral part of interior climate and life costing.

To conserve our energy resources, the designer must look beyond conventional building materials and seek new ones in order to achieve thermal integrity. For example, in curtainwall designs, the aluminum glass-holding members themselves can make a vital contribution to the overall thermal efficiency.

Kawneer pioneered the positive thermal break concept in windows and wall systems. By providing a thermal barrier, contact between inside and outside is eliminated. Heat transfer to the outside in cold months and into the building during warm months is minimized. Result: Expenditure for heating and air conditioning is reduced and energy is conserved. And, by offering an extensive line of thermal barrier products, Kawneer is able to give you a great degree of design latitude, preserving thermal integrity without esthetic compromise.

All of these innovative products are covered in the Thermal Products section of Sweets Architectural File. Or, write for our new book, Kawneer Thermal Barrier Products, Kawneer Architectural Products, Dept. C, 1105 North Front Street, Niles, Michigan 49120.

For more data, circle 81 on inquiries.
1602 I.G. Thermal Curtainwall — choose from a wide variety of thermal curtainwall systems for high-rise buildings and framing systems for storefront and low-rise applications.

SM 350T Thermal Framing — The patented seamless coupling mullion feature on this product provides a unitized framing system with unbroken sight lines.
Don’t Let Your Clients Accept Substitute Docklevelers

With today’s high labor costs and safety emphasis you design loading docks to include permanent docklevelers. Facts prove they can easily pay for themselves in one year.

However, to assure maximum return on investment, specify genuine Kelley Docklevelers of the right type, size and capacity.

Docklevelers with patented automatic safety features and a predictable life span to stand-up to high volume use year-after-year.

Choose hydraulic or mechanical, standard heavy duty or extra-heavy duty models. Kelley Docklevelers cost about the same, or even less.

So there’s no reason to accept substitutes. Get the complete facts from your Kelley Representative or contact:

Kelley Company, Inc.
6768 North Teutonia Avenue
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THIS NIFTY WEATHER MACHINE IS YOUR ANSWER TO

ASHRAE 90-75 ENERGY GUIDELINES.

The new Lennox DSS1 system lets you design your own single zone HVAC package to surpass ASHRAE 90-75 energy guidelines. The DSS1 offers extraordinary flexibility...efficient operation and service...exceptional energy savings...and consequent cost savings.

Here are a few of the many DSS1 options that give you the right size, right energy, right cost for your application:

- 26 to 45 tons cooling; up to 950,000 Btuh heating.
- Two-speed, first stage compressor saves energy.
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- Heat pump options available soon.
- Solid state, energy-saving control system.

Get the facts.

For complete information, see your Lennox Territory Manager. Or write: Lennox Industries Inc., 760 South 12th Avenue, Marshalltown, Iowa 50158.

Effy problem-solving ideas from Lennox.
ECONOMICAL WALLS…
Beneath the durable and attractive vinyl-clad steel surface of each general care patient wall from Square D Company lie two significant economies. First, there's the unusually high quality we can offer at unusually competitive prices—thanks to the latest manufacturing techniques. And second, each modular wall is completely piped and wired at the factory to meet all existing codes. Which means they can be installed in hours instead of days.
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Square D consoles efficiently arrange vital patient care services in a compact panel that's attractive and easy to use. In addition to outlets for medical air, vacuum and oxygen, Square D consoles can accommodate various arrays of patient nurse calls, monitoring jacks, power receptacles, QWIK-GARD® ground fault receptacles, etc. All according to your specifications.

Square D also offers sturdy bed bumpers that protect walls and delicate equipment from damage when the bed is moved.
There's more to Square D patient care systems than meets the eye. To find out more about them, contact your nearby Square D field office. Or write us: Square D Company, Dept. SA, 3300 Medalist Drive, Oshkosh, WI 54901. (414) 426-1330

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VONAR interliner kept one of the chairs from burning up in this limited ignition fire.

This test dramatically illustrates that VONAR® 3 interliner can reduce the likelihood of ignition of upholstered furniture as a unit. Should ignition occur, it can reduce the burning rate of upholstered furniture in limited ignition situations.

Ten minutes, thirty seconds before this photo was taken, these two office chairs were identical in every way but one. Same construction, cushioning foam and upholstery fabric. Both good looking and comfortable.

But the nylon fabric on the chair on the right had been backcoated with VONAR 3 interliner at a modest additional cost.

The test began with identical wastepaper fires in the baskets under the two seats. After one and one-half minutes, the fabric on both chairs was ignited. After four minutes, the paper fires were out, but the chair without VONAR continued to burn until completely consumed.

The chair with VONAR 3 did not. As the flames heated the VONAR interliner, it released heat-absorbing water vapor and a flame retardant. As the VONAR absorbed heat, it formed a rigid, insulating char layer on the chair parts in contact with the ignition source.

The maximum contribution obtainable from VONAR interliners occurs when VONAR totally envelops flammable cushioning materials. If VONAR interliners are ripped or cut, their degree of protection is diminished. For that reason, VONAR is not recommended for seating areas where there is concern about vandalism or intentional fire.

Let us help you determine what a difference VONAR can make in your furniture or in your future specifications. Use the coupon or write: Du Pont Co., Room 25337A, Wilmington, DE 19898.
Glasbord® ribbed panels help your refrigerators refrigerate.

...foodstuffs stay fresher

Glasbord ribbed panels on your cooler walls allow free flow of cold air around tightly stacked boxes, bins, and cartons. Foodstuffs stay fresher, spoilage is reduced, profits go up.

Glasbord ribbed panels are a tough, durable fiber glass reinforced plastic (frp) lining material, compression molded with protruding ribs to assure maximum air circulation at wall areas. "Hot spots" that encourage spoilage are eliminated. Panels are nonporous, stain resistant, USDA accepted.

Learn how Glasbord ribbed panels can help your refrigerators refrigerate. Get the full story today.

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Plaster in a roll™ the no problem heavy duty wallcover that covers problem walls ...including concrete block!

Plaster in a Roll™ goes up like wallpaper over every conceivable surface including poured masonry, concrete block, plaster, expanded foam and wood.

This unique gypsum impregnated jute product bridges small voids, hides blemishes and bumps. Available in decorator colors and fabrics. Class A flame spread.

Exceptionally durable and affordable.


For more data, circle 89 on inquiry card
TCS...THE LOGIC OF ITS USE

Rarely if ever has metal roofing been employed with more stunning visual impact than on Robin Hood Dell West, the Philadelphia Orchestra’s new summer home, which will also serve as a creative center for other groups in the performing arts.

In specifying over 80,000 square feet of TCS (Terne-Coated Stainless Steel) on this exciting structure, the architects were primarily influenced by several practical as well as aesthetic considerations. Among them was the material’s unsurpassed durability which is measured in generations rather than years. They were also aware that TCS weathers naturally to a uniform and attractive warm gray; that, properly installed, it will never need maintenance; and that it is highly resistant to even the most severe corrosive attack.

For more data, circle 90 on inquiry card
The steel-framed, long-span system:

a natural choice for five new Florida parking garages.

Five new open-deck parking garages, accommodating up to 3,402 cars, are serving Florida's state employees in Capitol Center—a complex of government offices in Tallahassee.

The steel-framed, long-span concept was chosen over competitive systems for reasons combining economy, construction speed and aesthetics.

From the start, sites were selected and the respective structures designed with every intention of preserving visual harmony with the existing buildings and landscaping of Capitol Center. The happy result of this careful planning is that most of the trees are still there!

THE GREATEST ECONOMY

As many as eight different structural systems were used as models for evaluation. This in-depth study, which examined construction speed as well as material costs, showed that structural steel framing with composite cast-in-place concrete decks had the potential for the greatest economy.

The decision proved wise. Construction cost per car is figured at approximately $2,400—a unit cost substantially lower than comparable facilities in Florida.

NO FIRE PROTECTIVE MATERIALS NEEDED!

One of the decisive elements in establishing the low-cost estimate for the steel-framing system was the fact that the steel structures could be left exposed and unprotected—except for painting.

Changes in the regulations of a number of building codes (and fire insurance rates) have been effected through a research project carried out at Scranton, Pa., under the auspices of the American Iron and Steel Institute. The dramatic and fully documented Scranton Fire Test was an actual auto burnout in a normally occupied open-deck public parking garage. It confirmed the results of previous tests: an automobile fire in these structures is a low-hazard fire.

STANDARD MODULE

For all the five facilities (named Alpha, Beta, Gamma, Delta and Epsilon) the designers selected a standard bay module, which proved to be a major factor in cost-cutting.

Each bay measures 55-ft. wide with a 20-ft. distance between columns and a floor-to-floor height of 10-ft. These dimensions allow angle (58 degrees) parking for standard-size cars and perpendicular parking for compact cars.

Self-parking is, of course, made easier by this amount of long-span, column-free space.

3,446 tons of ASTM A36 steel went into the five facilities which, together, have a floor area of 1,074,909 sq. ft. Only two column sizes were used throughout: W10 x 49 and W10 x 72. All beams are W24's with the majority weighing 68 lbs. per linear foot. Design loads are 50 psf for roofs and floors.

United States Steel is ready to help you with your design of a long-span, open-deck garage. For a Structural Report on the Capitol Center Parking Garages, and for further information, write to U.S. Steel, P.O. Box 86 (C614), Pittsburgh, Pa. 15230. Or contact a USS Construction Representative through your nearest USS Sales office.

United States Steel

Owner: Department of General Services, State of Florida.
Architects/Engineers: Joint venture organization: Barrett, Daffin and Figg, Tallahassee, Fla.
De Leuw Cather, Associates, Chicago, Ill.
Schweizer Associates, Winter Park, Fla.

Steel Fabricators: Joint venture organization: Musselman Steel Fabricators, Inc. (Prime Coordinator), Tampa, Fla.
Aesco Steel, Montgomery, Alabama.
Florida Steel Corp., Jacksonville, Fla.

Steel Erector: North Florida Erection Co., Inc., Jacksonville, Fla.
The new Mississippi Baptist Medical Center in Jackson puts a $22,000,000 building and $13,000,000 worth of health-care equipment at the service of residents of the area. The 600-bed facility includes 19 operating rooms, a coronary care unit, a burn unit, and a step-down unit for recuperative care. Supply and food carts circulate throughout the building 24 hours a day on five computerized Dover cart lifts. These special elevators dispatch and deliver the carts automatically to patient floors. Passenger and service traffic is smoothly handled by eight Dover Traction Elevators and one Dover Oldraulic Elevator. For more information on Dover Elevators and Dover's special lifts and dumb waiters for hospital use, write Dover Corporation, Elevator Division, Dept. A, P.O. Box 2177, Memphis, Tenn. In Canada: Dover/Turnbull.

For more data, circle 92 on inquiry card

Mississippi Baptist Medical Center
Jackson, Mississippi
Architects: Ellerbe Architects/Engineers/Planners
Barlow & Plunkett
Contractor: Turner Construction Co.
Elevators installed by Dover Elevator Co.
For more data, circle 93 on inquiry card

*For more data, circle 94 on inquiry card

For more data, circle 95 on inquiry card

For more data, circle 96 on inquiry card
The " Phantom" Passes Unnoticed... Until You Need Him.

When you need a sprinkler system that answers construction and aesthetic standards, "The Phantom" is your answer! Once installed, you'll hardly ever notice him—hidden behind a flush plate that blends with practically any ceiling. But if fire threatens, he strikes back . . . fast! Within seconds, the plate falls away, "The Phantom" pops down, and fights back. Reliable performance that won't give you failure a ghost of a chance. When your project calls for a sprinkler system that's architecturally sensitive, just remember "The Phantom." You'll find him discreet and effective, beyond a shadow of a doubt.

SOUTH MILWAUKEE, WI 53172

For more data, circle 96 on inquiry card
In Houston's Famous "The Galleria" Skyline

Five Ceco formwork jobs in eight years

Contractors and owners coast to coast save on forming costs with Ceco services

Impressive architecture in concrete is adding excitement to Houston's modern, Galleria skyline. These five projects are typical of Ceco's concrete formwork in Houston over the past eight years.

With Ceco services you get simplicity, speed and reliability.

- And a firm contract price that represents cost savings to contractors and project owners.
- And performance by formwork specialists who take pride in getting the job done right.

Ceco offers economical and time-saving formwork for rib-slabs, waffle-slabs, flat-slabs, columns and beams. Services are nationwide on a local basis. For more facts, please see Sweet's or contact your nearest Ceco office.

1. Post Oak Tower (1969)
   Hellmuth, Obata and Kassabaum
   Neuhaus and Taylor
   Ellisor Engineers, Inc., structural engineers
   Harvey Construction Company, contractors

   Hellmuth, Obata and Kassabaum
   Neuhaus and Taylor
   Ellisor Engineers, Inc., structural engineers
   H. A. Lott, Inc., contractors

   Hellmuth, Obata and Kassabaum
   S. I. Morris and Associates
   Ellisor Engineers, Inc., structural engineers
   Harvey Construction Company, contractors

4. Galleria Plaza Hotel (1976)
   Hellmuth, Obata and Kassabaum
   S. I. Morris and Associates
   Ellisor Engineers, Inc., structural engineers
   H. A. Lott, Inc., contractors
THREE QUESTIONS TO ASK BEFORE YOU BUY A COLOR FENCE.

1. Are all fence components zinc-coated under the color coating?
   USS CYCLONE fence is—so if the coating gets damaged, your fence is still protected against corrosion. 2. Are the posts, rails, and terminal posts all roll-formed, so they're self-draining?
   CYCLONE line posts, for instance, are C-shaped. They're almost 25% stronger than the pipe usually supplied—and water can't collect to corrode from inside. 3. Who will install your fence? We install all CYCLONE fence with expert crews. We take the headaches and responsibility, not you.

CYCLONE fence comes in two colors: green, to blend with the landscape. Or black (that seems to "disappear"). We think our color fence will look better, last longer, and take less maintenance than any other chain link fence. Ask for sample specifications. Look for CYCLONE in the Yellow Pages. Or write Dan Hoover, U.S. Steel Supply, 13535 S. Torrence Ave., Chicago, Illinois 60633.
There's nothing ordinary about Kreolite® Wood Block factory floors!... In fact, they're very special and deserve your special consideration. For instance: They have so many advantages over other types of floors (see panel at right), that we strongly recommend custom designing so that no feature will be overlooked. Therefore, when you choose Jennison-Wright End Grain Wood Block factory floors, be sure that they are given pre-installation planning so that they'll perform as they should. Our sign engineers will expertly perform this service—no charge, of course.

Jennison-Wright Corp., P.O. Box 691, Toledo, Ohio 43694

For more data, circle 103 on inquiry card

ADVANTAGES OF KREOLITE® FLOORS:
1. Easy relocation and concealment of service lines to machinery.
2. Speed and economy of replacement in aisles and other heavy wear areas.
3. Special finishes for absolutely dust-free surfaces.
4. Versatility in providing for in-floor conveyor systems, tow-lines, etc.
5. Measurable contributions to noise abatement.
6. Easy installation of oil dispersal and/or recovery systems.
7. Traditional properties of comfort through insulation.
8. Non-sparking surface in volatile areas.
9. Reduction of damage to dropped tools and products.
Distinguished character frugal personality.

Behind the distinguished Vari-Tran® coated glass walls of Tower Place lies a building with a frugal personality. A personality which has proved to the owners that spending a little more for glass can save a lot of money and energy in the long run.

Check the figures in the chart. Choosing Vari-Tran coated glass in Thermopane® insulating units, the owners spent 55% more than the base comparison glass, 1" Grey Thermopane. But look at the numbers right down the line from the money saved on heating, cooling, and distribution equipment to the impressive savings on annual operating costs.

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<table>
<thead>
<tr>
<th></th>
<th>1' Grey Thermopane</th>
<th>Vari-Tran 1-18 Glass in Thermopane Insulating Units</th>
<th>Savings $</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Glass Cost</strong></td>
<td>$1,064,412</td>
<td>$1,635,752</td>
<td>$571,340</td>
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<tr>
<td><strong>Heating, Cooling and Distribution Equipment</strong></td>
<td>$1,433,054</td>
<td>$74,308</td>
<td>$858,746</td>
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<tr>
<td><strong>Comparative Initial Construction Costs</strong></td>
<td>$2,497,068</td>
<td>$2,230,060</td>
<td>$267,008</td>
</tr>
<tr>
<td><strong>Annual Heating Cost</strong></td>
<td>$28,715</td>
<td>$23,377</td>
<td>$5,338</td>
</tr>
<tr>
<td><strong>Annual Air Conditioning Costs</strong></td>
<td>$28,473</td>
<td>$12,018</td>
<td>$16,455</td>
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<tr>
<td><strong>Annual Insurance Premium</strong></td>
<td>$2,497</td>
<td>$2,230</td>
<td>$267</td>
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<tr>
<td><strong>Annual Property Taxes</strong></td>
<td>$49,949</td>
<td>$44,601</td>
<td>$5,348</td>
</tr>
</tbody>
</table>

Building: Tower Place, Atlanta, Georgia
Developer: Ackerman & Company
Architect: Stevens & Wilkinson, Architects & Engineers, Atlanta, Georgia
General Contractor: Henry C. Beck Company
Glazing Contractor: Starline Inc.

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**NEW ADDRESSES**

Alper Associates, Inc., consulting engineers, have moved to the Spectrum Professional Office Building in the Bellverie Executive Office Park at Mason Road and Olive Boulevard, St. Louis, Missouri.

Robert G. Hammond Associates, Architects, announce the opening of an office at 414/S Sixth Street, Annapolis, Maryland.

Gensler and Associates Architects announce that they have moved to Suite 570, Two Century Plaza, Los Angeles, California.

Harold Wirum & Associates, Architects announce the relocation of their office to 510 L Street, Suite 400, Anchorage, Alaska.

Robert Green has formed a new design firm under his name, located at 233 Sansome Street, San Francisco, California.

O’Malley & Associates, Inc., have moved to One Mall North, Suite 400, Columbia, Maryland.

**New Associates, Promotions**

Koster and Associates Architects Inc., of Cleveland are pleased to announce that David L. Holzheimer has become a partner.

The architectural and planning firm of Thompson, Hancock, Witte & Associates, Inc., recently appointed Walter F. Pate as an associate.

Richard J. Hallinan has been elected a corporate vice president of Combustion Engineering, Inc.

Lee Payne has been appointed Director of the Industrial Design Department in Georgia Tech’s College of Architecture.

Wallace J. Toscano, architect, has joined the firm of Karlsberger and Associates of Columbus, Ohio, as director of design.

Richard L. Engler, AIA, has been appointed executive vice president and director of operations of Folse/HDR, the New Orleans, Louisiana, office and justice facilities design center of Henningson, Durham & Richardson.

Gary Bowen has named a vice president of Bahr Vermeer & Hacker Architects, and is also president-elect of the Omaha Chapter of the American Institute of Architects.

Olga E. Peters has been named a vice president of Caudill Rowlett Scott.

The Environmental Planning and Design Partnership have named Geoffrey L. Rausch, Jack R. Scholl, John O. Simonds, Philip D. Simonds, C. Richard Hays and Paul Dorr Wolfe partners.

William H. Gantz has been made an associate in the firm of Eugene J. Mackey & Associates, Architects.

James F. Rea has joined the staff of Daniel, Mann Johnson & Mendenhall (DMJM) as manager of airport planning.

Johnson, Johnson & Roy Inc., announce the promotion of two members of the firm to the title of associate. They are: Stephen W. Schar and George Sass.

Marshall & Brown, AIA, Architects/Engineers/Planners has recently named Ronald Williams Ford, as a senior associate.
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196 ARCHITECTURAL RECORD March 1977
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