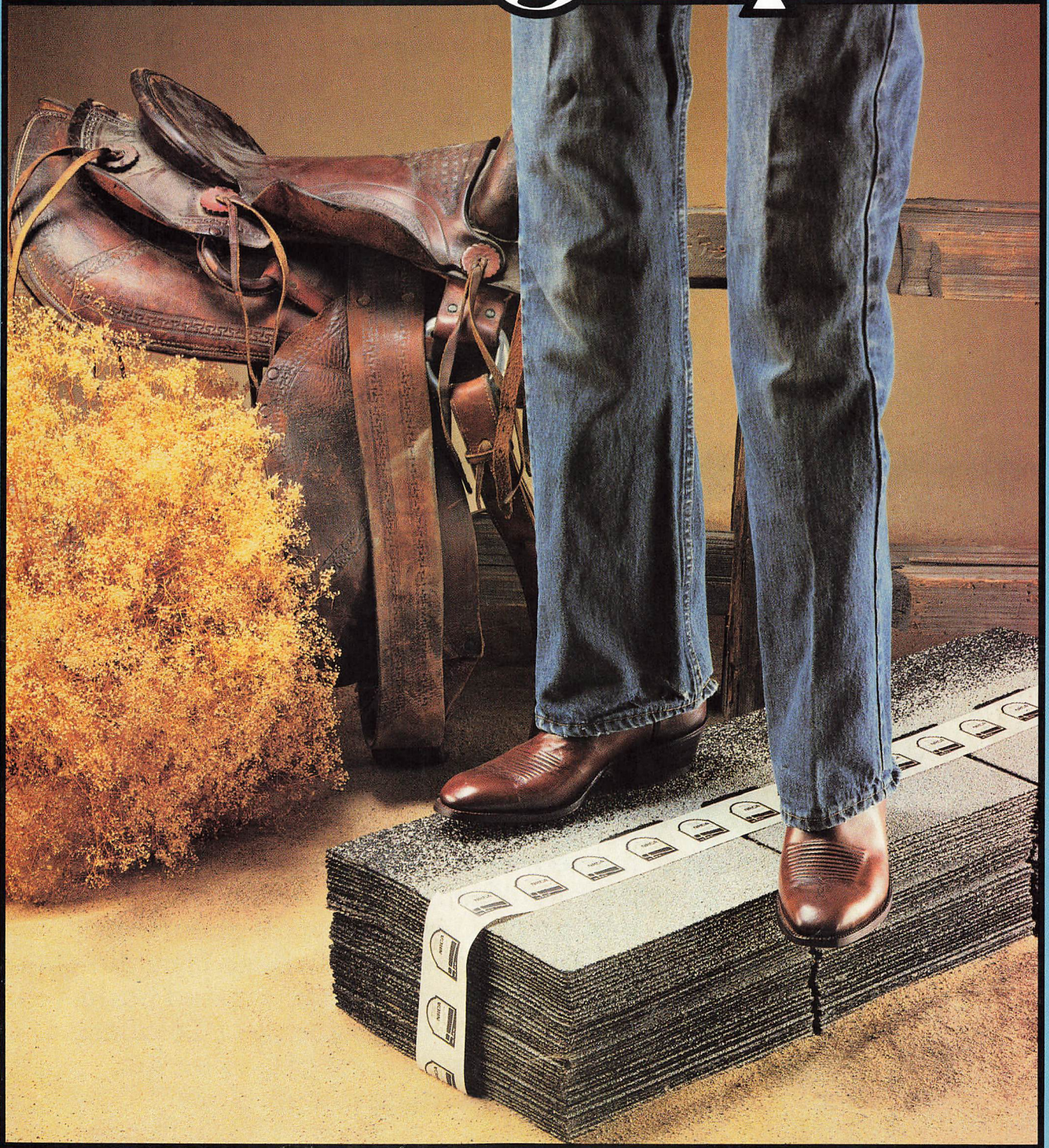


# roofing spec

\$2.00

National Roofing Contractors Association

February 1983



# STOP FIXING YOUR ROOF.

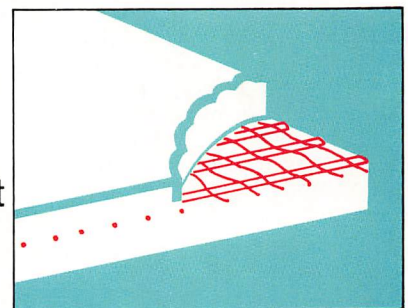


Is it ordinary single ply membrane, or is it CoolTop?

Sure, your next roof will be single ply membrane. After all, if you hate leaks, why keep patching and patching an old built-up roof? Single ply membrane is the obvious answer. But which one? An EPDM, a PVC... Or CoolTop?

CoolTop is different. Here's why: 1) It's made from pure CPE\* - chlorinated polyethylene - so it has no plasticizers to leach out and weaken the membrane

structure. Moreover, no other roof resists weather, fire, oil or chemicals as well. 2) CoolTop has a tough, Fortrel® polyester fabric reinforcement. So it outlasts, and outperforms, other roofing membranes. 3) CoolTop saves energy. In fact, it's actually 85% heat reflective. So you save on air conditioning costs. 4) CoolTop installs easily on just about any roof; slant, curved or flat.



A membrane this tough simply lasts longer.

5) CoolTop is a roofing system. Sheets are pre-marked to save installation time. Plates and screws are 25 times more rust resistant than even galvanized fasteners. And: the seams are heat welded to eliminate adhesive and solvent problems. All this for one reason only. So that now you can forget all about ever fixing your roof. \*Chlorinated polyethylene from the Dow Chemical Company. Fortrel® is a registered trademark of Fiber Industries, Inc., a subsidiary of Celanese Corporation. CoolTop® is a trademark of Cooley, Inc.

For technical information, write or phone: Cooley Roofing Systems, Inc., 50 Esten Avenue, Pawtucket, Rhode Island 02860. Tel: (401) 724-0490. **Cooley Roofing Systems.**

**CoolTop**

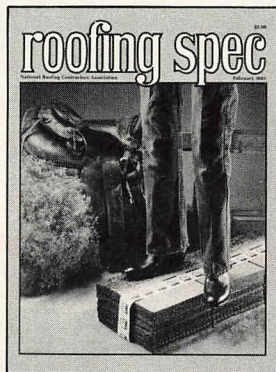
# roofing spec

Vol. 11, No.2

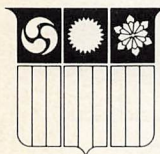
February 1983

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William Good, CAE,  
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Mike Beightol, Editor  
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Assistant



Welcome to San Antonio,  
site of the 96th Annual  
NRCA Convention & Exhibit.



## NATIONAL ROOFING CONTRACTORS ASSOCIATION

8600 Bryn Mawr Avenue  
Chicago, Illinois 60631  
(312) 693-0700

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# Comment

## To A Good Show

The most famous event in San Antonio's history took place exactly fifty years before NRCA was formed, on a site within walking distance of the downtown hotels and Convention Center serving as the gathering place for NRCA's 96th annual meeting.

The Battle of the Alamo was probably not as glamorous as Walt Disney would have us believe, but it was an inspiration to the rest of a young country. It was the first in a long series of events that make San Antonio, in Mark Twain's words, "one of America's four unique cities."

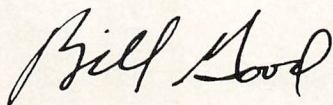
San Antonio's uniqueness includes its sharp architectural contrasts: the Hemisfair Tower is in plain sight from the remains of the Alamo's chapel, and the new Hyatt Regency is just down the street from La Villita (Little Village), where the aristocrats of the town lived over a century ago.

The city's special character also comes from its framed Riverwalk, certainly an unusual feature for a major metropolis, especially when one considers that the river started out as a sewer, and came very close, less than fifty years ago, to being filled and paved.

And it's unique because, for the tenth largest city in the nation, it has retained a sense of community and compactness; yet the presence of the city's largest employer - the Department of Defense - is everywhere noted.

So it's a city of history and of contrasts, and it seems appropriate that NRCA meet in San Antonio in 1983, three years from our own centennial, and at a time when change and uncertainty are the order of the day for our industry.

We hope you find the Convention to be just as interesting and unique as our host city. We have a hunch that you'll remember the San Antonio Convention, not in the way Americans remembered the Alamo in 1836, but as another step in NRCA's "pursuit of excellence."



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**lightweight.** Contour Taper Tile® is a one layer system that adds almost no weight to the roof.

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**new roofs or re-roofing.** Performs equally well with conventional roofing systems on flat or sloped roofs and with most of the new single membrane systems now available.

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# Ideas, notes and random thoughts

**Wow!** The 97th Annual NRCA Convention & Exhibit kicks off this month with a fabulous week-long *Roofing Fest* set for the gracious Texan city of San Antonio. More Business Sessions, an address from Former President Gerald Ford, an expanded Manufacturer Exhibit (over 545 booths — the largest ever!), and an anticipated 5,000 plus convention attendees. The convention's theme is "The Pursuit of Excellence," evident all week long with enough momentum to carry us through the rest of 1983. Have we got a show for you!

m.b.

**Thank you** San Antonio. Mayor Henry Cisneros has officially declared Convention Week (Feb. 21-25) National Roofing Contractors Week. NRCA is grateful and very proud of this esteemed honor.

**NRCA is again publishing** the Convention's only daily newspaper, *The Convention Spec*. Check it every morning for the latest in Convention news and last minute program changes. *The Convention Spec* is available in all official Convention hotels and the Convention Center.

**Round Two** of the NRCA Roofing Systems Conferences crank up again March 24 in Charlotte, N.C. and April 7 in Kansas City. The conference covers all aspects of roofing systems and is designed to

enlighten all construction professionals. — architects, engineers, spec writers, general contractors, building owners and roofing contractors. For more information, contact NRCA's Alan Grayson, Director of Education, 8600 W. Bryn Mawr Ave., Chicago, Ill. 60631.

## National Roofing Foundation Update

The National Roofing Foundation wishes to thank the following new Friends for their support.

B & L Sheet Metal & Rfg. Inc.  
Bloomington, Ind.

Barra Corp. of America Inc.  
Joseph D. Heim  
West Caldwell, N.J.

Central Roofing  
Minneapolis, Minn.  
Advanced Industrial Systems Inc.  
T.W. Guilderson  
Lexington, Mass.

You can become a Friend by donating \$50 annually to The Foundation. Your tax-deductible contribution will help provide scholarships and develop educational programs to improve the roofing industry. For information contact NRF, 8600 Bryn Mawr Avenue, Chicago, Ill. 60631.

**More good news** on the economic front, maybe. American consumers were able to lower installment debts a seasonally adjusted \$324 million in October, 1982, said the Federal Reserve Board. What this means is Americans are still stifled by the credit market, are afraid to add further debts, but at least are starting to pay back more credit than they take on.

**Sixty-six years later** and Lawson Roofing Co., Inc. still backs its built-up roofing systems.

The San Francisco firm recently honored a five-year guarantee 66 years after it went into effect.

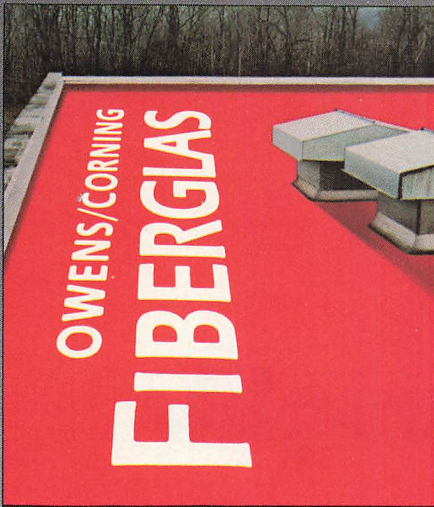
In 1916, the company headed by F.E. Lawson installed a roof on a commercial building, consisting of five-ply, 15-pound asphalt and gravel surface. The total price for the job was \$75.

A leak developed because of water entering the stucco surface of the stairway penthouse.

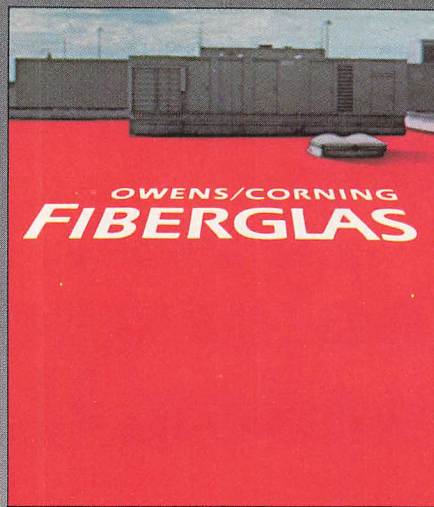
The building owner showed Frank Lawson an original bill of sale and guarantee against leaks "due to defective material or improper installation," so Lawson fixed the roof.

**"Money is something I understand only vaguely and think about it only when I don't have enough to finance my current enthusiasm, whatever it might be. All I know about money is that I have to have it to do things."**

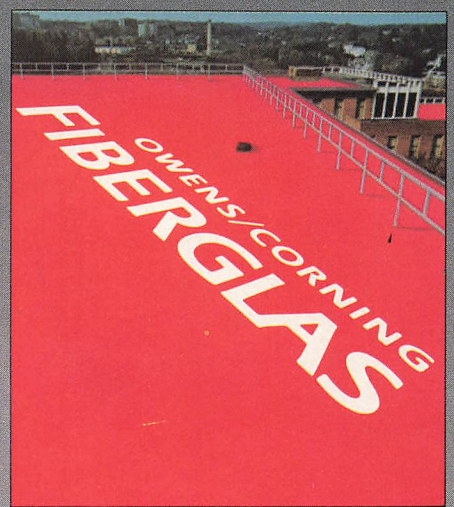
Walt Disney



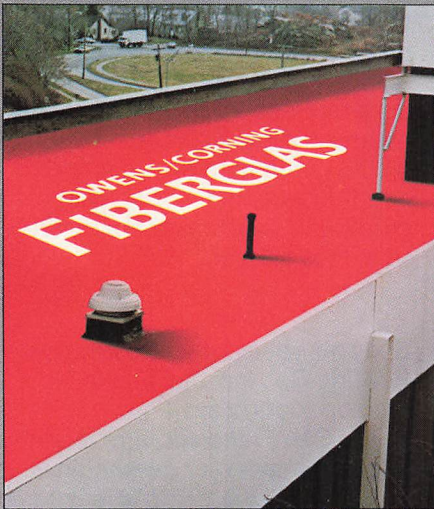
Double-layer Fiberglas insulation over FURI.  
3 plies Perma Ply-R. Gravel surface.



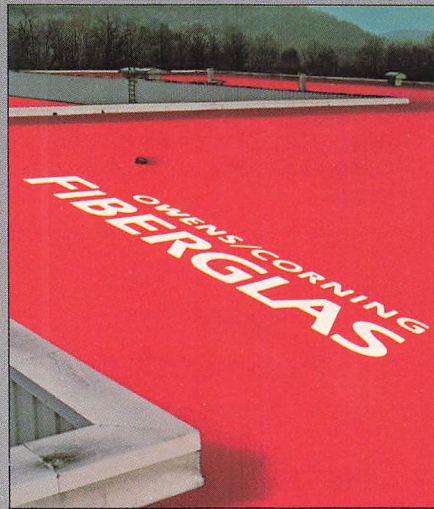
Single-layer Fiberglas insulation.  
3 plies Perma Ply-R. Perma Cap® surface.



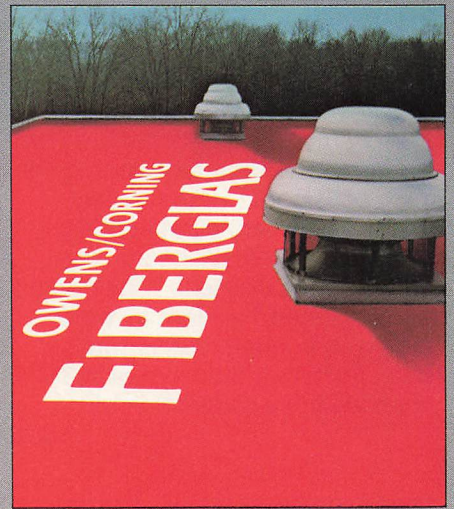
Single-layer Fiberglas insulation with taped joints.  
2 plies Perma Ply-R. Gravel surface.



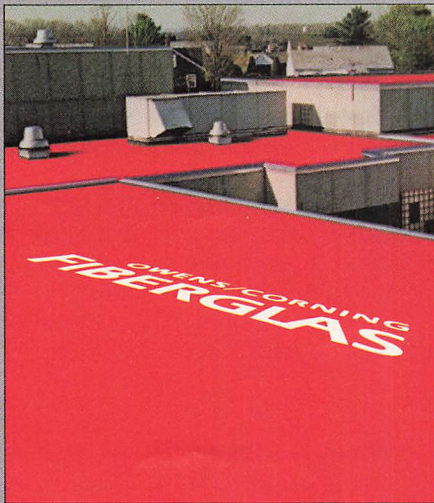
Double-layer Fiberglas insulation.  
4 plies Perma Ply-R. Smooth surface.\*



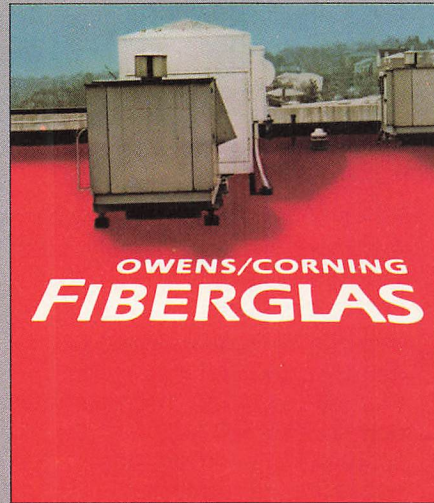
Single-layer FURI. Perma Ply No. 28 perf. base sheet.  
2 plies Perma Ply-R. Gravel surface.



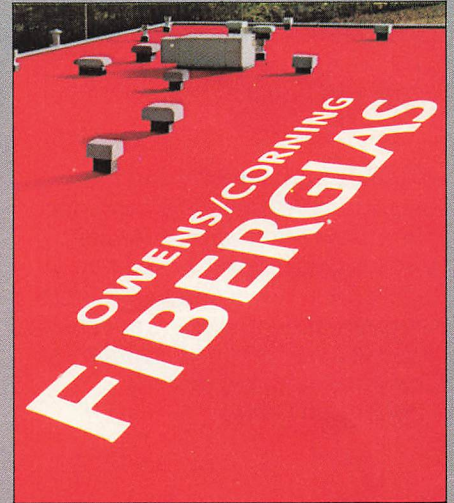
Single-layer Fiberglas insulation. New Perma Plus-2® system.† Smooth surface.



Double-layer Fiberglas insulation. New Perma Plus-2 system.† Gravel surface.



Single-layer Fiberglas insulation.  
3 plies Perma Ply-R. Unsurfaced.



Perma Ply No. 28 base sheet. 2 plies Perma Ply No. 11. Perma Cap surface over wooden deck.

\*Double Eagle® Roof †1 layer IPS, 1 layer SPS

# THE TOP ROOF FOR ANY BOTTOM LINE.

No two roofs are the same. No two applications will be either. At Owens-Corning, we offer a full range of specifications to fit virtually every roofing need. So we can put the best roof over your head at a cost that won't go over your budget.

## GO RIGHT TO THE TOP.

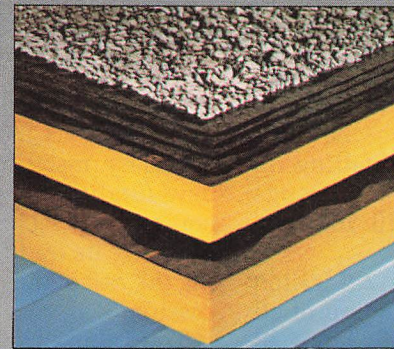
It stands to reason that to get the best roof, you have to start with the best roofing materials.

For instance, although it's underneath where you can't see it, your roof insulation deserves top priority. The chart shows you why Owens-Corning is your best choice.

We offer insulations for every application. In a full range of thermal values. A double layer of Fiberglas® or FURI® roof insulation can even provide R-values up to 40.

And the double layer serves a double purpose. It delivers better performance. By installing a second layer of Fiberglas roof insulation over the first and offsetting joints, you eliminate continu-

ous vertical gaps. So heat loss and gain is lowered. Membrane stress is reduced by as much as 10%. And roof life is increased.



**OUR TOP ROOF.**  
The *Double Eagle* roof. Double layer of Fiberglas insulation and 4 plies of Perma Ply-R. Our best roof. The industry's best guaranty—20 years.

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Even the best built-up roof is only as good as the way it's put down. That's why Owens-Corning has set up a unique Certified Roofing Contractor

Program. Certified Contractors are specially selected professionals who have met the industry's most stringent requirements—Owens-Corning's. The result: roofs that set the industry's highest standards.

And when a Certified Contractor installs our double-layer insulation, 4-ply Perma Ply-R roof, you can get the industry's best guaranty. 20 years.

## YOU CAN'T AFFORD TO OVERLOOK OUR ROOF.

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Owens-Corning Fiberglas Roof Insulation	●	●	●	●	●	●	●	●
Owens-Corning Fiberglas FURI®	●	●	●		●	●	●	●
Perlite								●
Urethane				●	●	●		
Composites								
Wood Fiber								

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# NATIONAL NEWS

## Housing Spurt Helps to Lift November Construction Contracts

Contracting for total new construction surged in November as the housing market responded to falling interest rates, reported the F.W. Dodge Division of McGraw-Hill Information Systems Company.

November's total of \$12.9 billion of newly started construction of all kinds raised the seasonally adjusted Dodge Index 16 percent above October's value to 122 — its highest level in a year and a half. The Dodge Index, a leading indicator of building activity and materials requirements, uses 1977 as its 100 base.

"The latest month's advance of construction contracting solidified the on-and-off recovery that began in 1982's second quarter," said George A. Christie, vice president and chief economist for F.W. Dodge.

"Falling mortgage rates and the proposed public works jobs program are strengthening this tenuous re-

covery and should keep it going well into 1983," Christie said. "With monetary restraint lifted and with new funding for public works, the construction sector is finally capable of filling its traditional role of leading the rest of the economy out of recession."

The value of residential building advanced a seasonally adjusted 12 percent in November on the strength of \$5.6 billion of newly started projects.

"Both one-family and multifamily building rose sharply in November as the decline of mortgage rates accelerated," Christie pointed out, noting that since August the retreat from 17 percent conventional mortgage money to the recent 14½ percent has been accompanied by a "better than expected" 40 percent improvement of housing starts to November's annualized rate of 1.4 mil-

lion units — one indication of the latent demand for housing.

"With still more room for mortgage rates to fall, this strong response of the housing market suggests that most 1983 housing forecasts — now clustering around 1.4 million units — can safely be raised a notch," Christie said.

Two electric power plants — one for \$600 million in Arizona, and a smaller \$200 million project in Indiana — were instrumental in bringing November's total of nonbuilding construction contract value to a strong \$2.7 billion. After adjustment for normal seasonal variation, November's rate of contracting was 41 percent higher than in October when no major power plant work was reported.

Apart from the two electric utility projects, the balance of November's nonbuilding construction, consisting largely of public works projects, was unchanged from October's value.

"After several years of underfunding due to Federal budgetary restraint, prospects are looking up for highways, bridges and mass transit as Congress debates various proposals for a public works jobs program," Christie said.

Rising unemployment and declining capacity utilization stalled commercial and industrial building for another month. November contracts for nonresidential building totaled \$4.5 billion, down a seasonally adjusted one percent from October's already depressed value.

Commercial and industrial building showed across-the-board declines in the latest month, with starts of manufacturing buildings sinking

continued, page 10

### MONTHLY SUMMARY OF CONSTRUCTION CONTRACT VALUE

Prepared by F.W. Dodge Division  
McGraw-Hill Information Systems Company

	November 1982 Construction Contract Value (000,000)	Seasonally Adjusted Percent Change From Previous Month
Nonresidential Building	\$ 4,520.3	- 1
Residential Building	5,627.8	+ 12
Nonbuilding Construction	2,760.7	+ 41
<b>Total Construction</b>	<b>\$12,908.8</b>	<b>+ 16</b>

	11 Mos. 1982 (000,000)	11 Mos. 1981 (000,000)	Cumulative Percent Change
Nonresidential Building	\$54,985.6	\$ 55,610.6	- 1
Residential Building	52,932.2	56,393.2	- 6
Nonbuilding Construction	32,508.6	29,275.3	+ 11
<b>Total Construction</b>	<b>\$140,426.4</b>	<b>\$141,279.1</b>	<b>- 1</b>

#### DODGE INDEX

(1977 = 100, SEASONALLY ADJUSTED)

September 1982	117
October 1982	105
November 1982	122

# Kodak won't be developing roof problems.

## They have a Carlisle single-ply.

Kodak is one of the most progressive companies in the world. Their numerous innovations in camera equipment, film, paper and processing helped bring the magic of photography to the people.

As keen innovators, the people at Kodak are quick to recognize worthy advancements in other areas as well. That's why they were among the first major corporations to use Carlisle single-ply roofing for many of their buildings around the country—including this 5000 square-foot roof on Kodak's General Services Building in Rochester, New York. Here, as in all cases, Kodak had plenty of reasons for putting Carlisle in the picture.

Carlisle helped pioneer single-ply; our first roof installed over twenty years ago is still

going strong. And Carlisle provides the complete system: EPDM membrane produced in extra-wide widths at our two American plants. EPS insulation. Flashing. Edging. Pre-fab pipe seals. And application materials. We even train our authorized single-ply applicators at our school in Carlisle.

What's more, a Carlisle single-ply roof can be easily installed on new decks or right over top of failing built-up roofs. Even in marginal weather. It's virtually maintenance-free. And it can be warranted for up to 10 years.

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The roof that's requested by name.  
Carlisle SynTec Systems

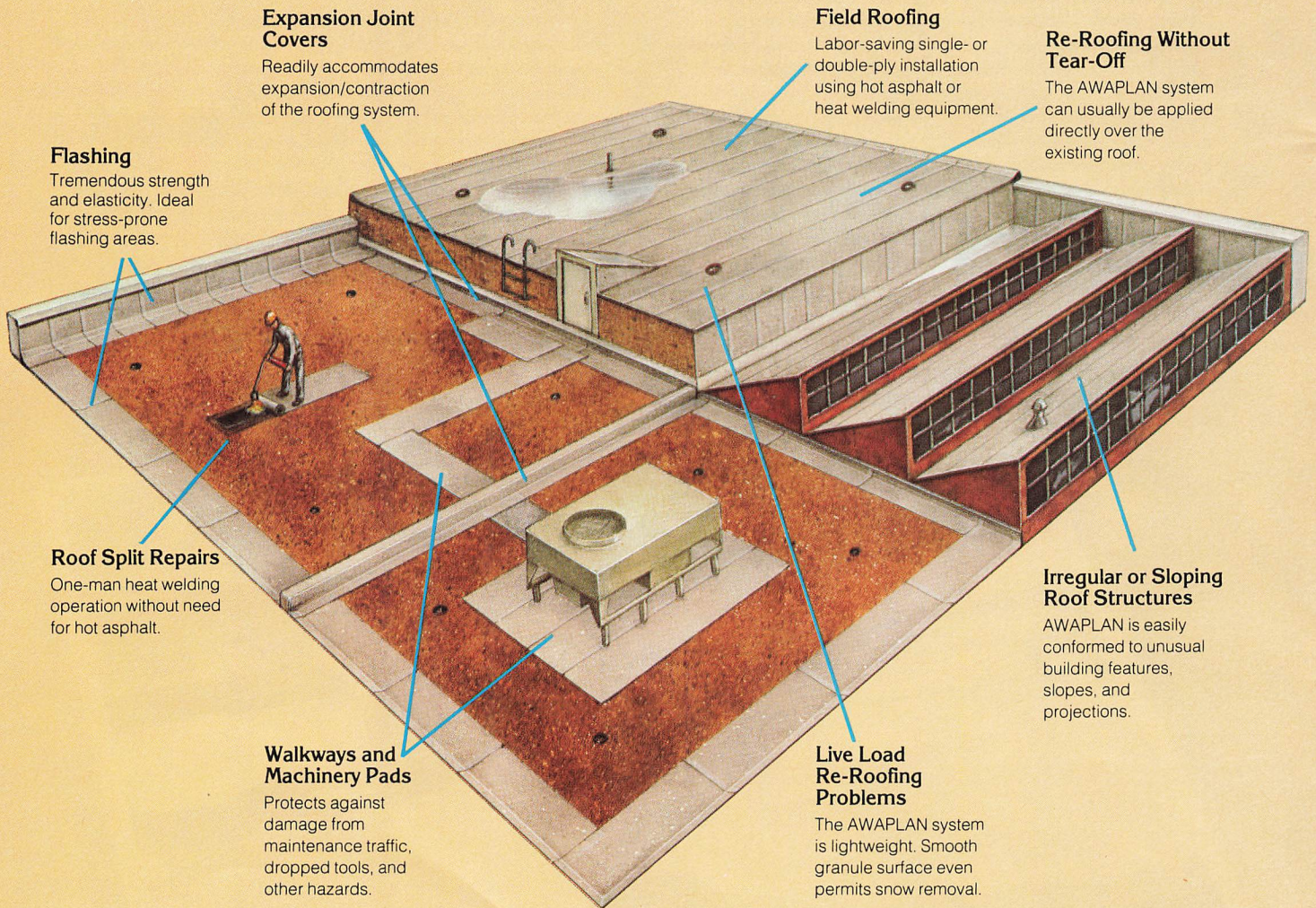
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Plasticized Asphalt Roll-Roofing

## For virtually every built-up roofing situation or problem.



### Expansion Joint Covers

Readily accommodates expansion/contraction of the roofing system.

### Field Roofing

Labor-saving single- or double-ply installation using hot asphalt or heat welding equipment.

### Re-Roofing Without Tear-Off

The AWAPLAN system can usually be applied directly over the existing roof.

### Flashing

Tremendous strength and elasticity. Ideal for stress-prone flashing areas.

### Roof Split Repairs

One-man heat welding operation without need for hot asphalt.

### Walkways and Machinery Pads

Protects against damage from maintenance traffic, dropped tools, and other hazards.

### Live Load Re-Roofing Problems

The AWAPLAN system is lightweight. Smooth granule surface even permits snow removal.

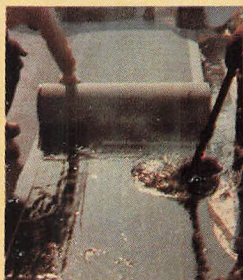
### Irregular or Sloping Roof Structures

AWAPLAN is easily conformed to unusual building features, slopes, and projections.

## Compatible with All Conventional Asphalt Roofing Systems

TAMKO AWAPLAN may be applied in combination with conventional materials — as a problem-solver for flashings and walkways, or as a total field roofing system.

Call or write for your free brochure. Or consult Sweet's Catalog File: 7.1/TAM. **1-800-641-4691** (In Missouri: 417-624-6644).



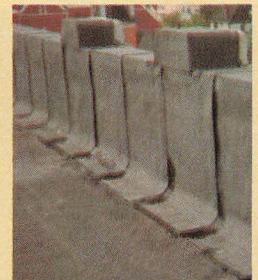
Hot Asphalt



Heat Welding



Roof Edging



Wall Flashing

**TAMKO Asphalt Products, Inc.** Home Office: PO Box 1404, Joplin, Missouri 64801

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# NATIONAL NEWS


continued from page 8

to a 25-year low as industrial capacity utilization slid further. At the same time, losses in these recession-sensitive building markets were partly offset by uncharacteristic gains in contracting for schools and hospitals.

At the end of eleven months, the cumulative value of all new construction started in 1982 was \$140.4 billion, a decline of one percent from the comparable year-ago total of \$141.3 billion.

Following is a summary of the Dodge construction statistics for November. These contract-award statistics, prepared and issued by the F.W. Dodge Division of McGraw-Hill Information Systems Company, measure the value of newly started construction that will be brought to completion over the months ahead. They indicate the amount and direction of future expenditures of this major sector of the economy.

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# Benoit Acquires Firm

The purchase of Shelter Insulation, Inc., San Antonio, was recently announced by Louis Benoit, President, Benoit Inc.

Shelter Insulation, a manufacturer of roof insulation, will receive a name change and a face lift. Shelter will now be operated as Benoit Industries, Inc., a wholly owned subsidiary of Benoit Inc., St. Paul, Minn.

Products will be marketed under the trade name BenCore Roof Insulation.


"We will continue to market the high quality products that have earned Shelter its excellent reputation in the marketplace," Benoit said. "This purchase included considerable talent which we intend to utilize in the

continued on following page

# HOT NEWS!


**A Special announcement from  
 Cleasby Manufacturing Co., Inc.,  
 Serving the roofing industry since 1949**

**Now we have two locations to serve you**



**CLEASBY**

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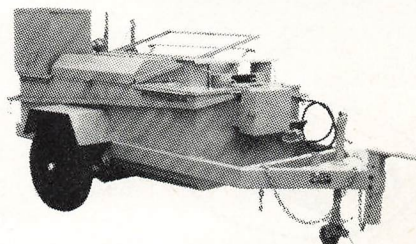
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Above Tubes	170 gallons	244 gallons
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continued

development of new products.”

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## Glass Fiber Felt Installation Detailed in NRCA Slide Show

The National Roofing Contractors Association (NRCA) announces the availability of an instructional slide presentation, “Application Techniques for Glass Fiber Roofing Felts.”

Prepared by noted roofing expert and NRCA Director Richard Baxter,

president of Carolina Roofing Service, Inc., Monroe, N.C., the presentation is a 35 minute, 95 slide program detailing application techniques for glass fiber roofing felts.

“The basis for this presentation is not how roofs fail, but rather how to avoid the installation problems which would eventually contribute to roof failure,” Baxter said.

In the program Baxter explains moisture effects, overcoming displacement problems, the “floating” myth, water cut offs and many other areas in glass felt roofing.

The sound & slide program is available at a cost of \$70 from NRCA at 8600 Bryn Mawr Ave., Chicago, Ill. 60631. Included with the program is a copy of Baxter’s popular booklet on installing glass fiber felts.

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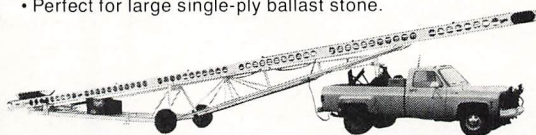
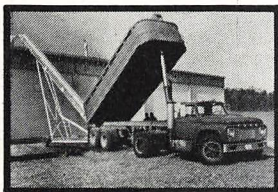
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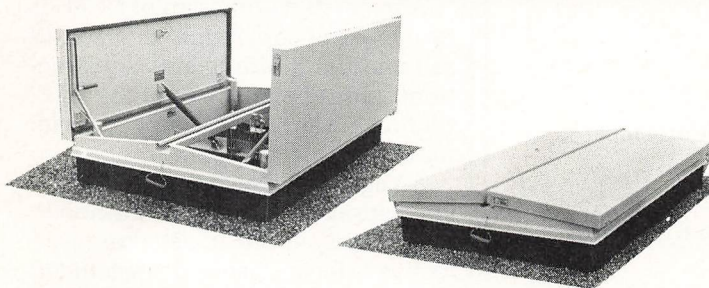
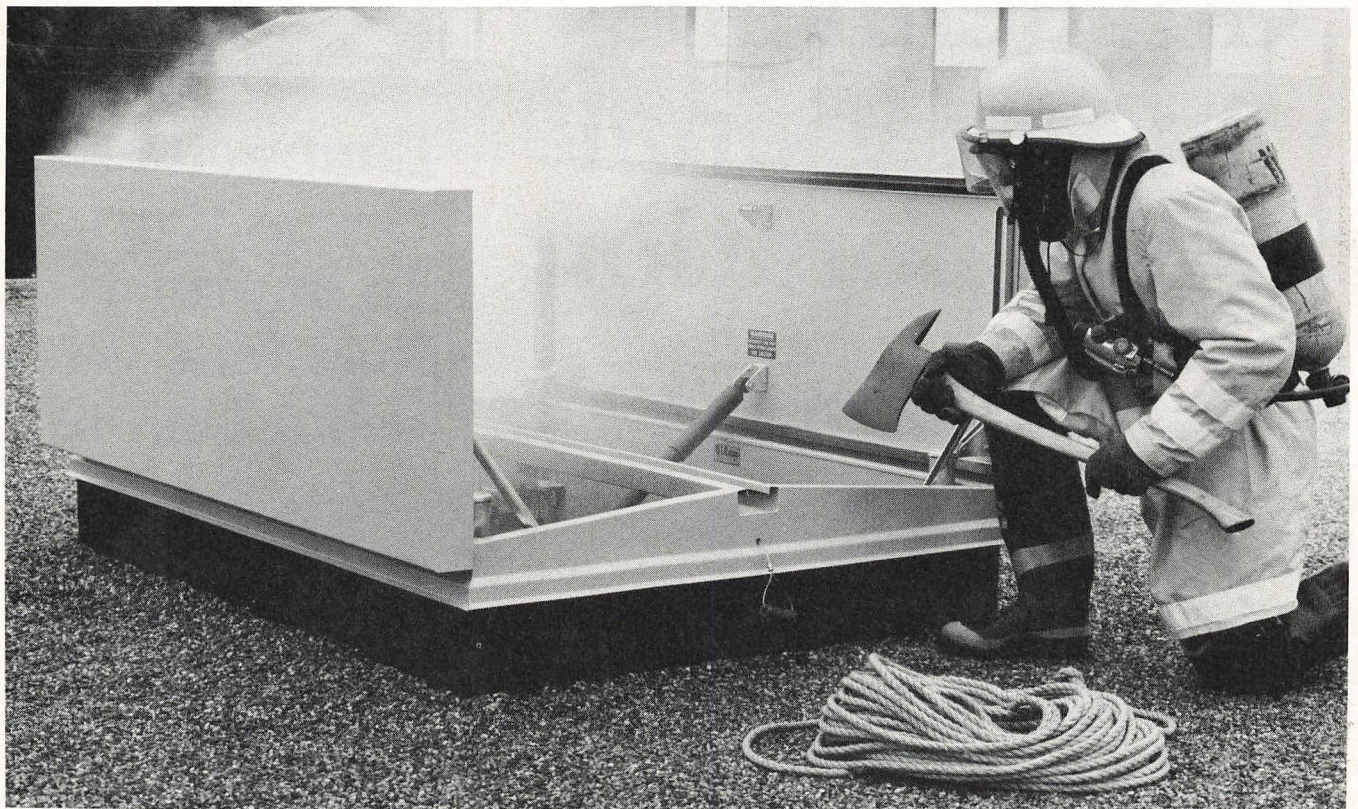
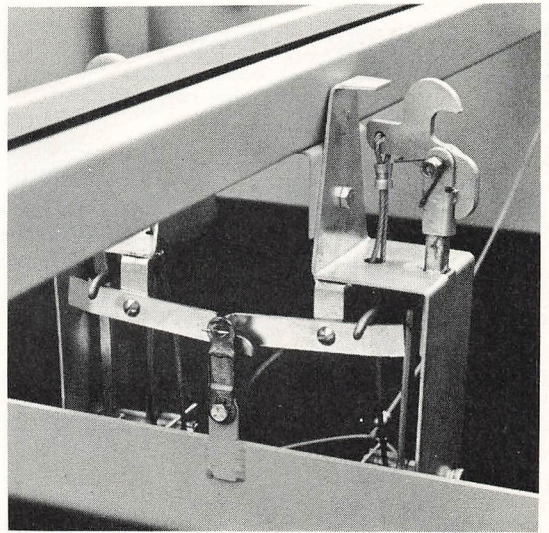
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## MRCA Elects New Board

The Midwest Roofing Contractors Association (MRCA) recently elected

a new slate of officers and directors for 1983.

Officers are: President Stanley W. Miller, Fort Wayne, Ind; First Vice President Rodney Naucke, Fort Smith, Ark; Second Vice President Allan Boone, Omaha, Neb; Secretary George S. Moeller, Kansas City, Mo; Treasurer Thomas Bollnow, Westmont, Ill. and Chairman of the Board, Hollis R. Porcher, Corpus Christi, Tex.

Board of Directors are: John Drew,

Mason City, Iowa; Vernon Larson, St. Paul, Minn; L.B. Morris, Kansas City, Mo; Francis M. Prosser, Colorado Springs, Colo; Edward G. Reifsteck, Kirkwood, Mo; Kurt Baumgartner, Wichita, Kan; Clifford Johnson, Tulsa, Okla; David Kielpinski, Milwaukee, Wis; Ned A. Kimbrel, Elk Grove, Ill. and Harlan Patchen, Rawlins, Wyo.

Donald G. McNamara, Milwaukee, Wis. was named the recipient of the 14th Annual James Q. McCawley Award at the MRCA Convention in Colorado Springs, Colo. McNamara is a past president of MRCA.

The McCawley Award is the highest award MRCA can bestow and is presented annually to the person selected by prior recipients of the award in recognition of outstanding service to the roofing industry.

## Contractor Group Works To Improve Relations With Labor Unions

The Associated Specialty Contractors, Inc. (ASC) has agreed to become a member of the National Construction Employers Council (NCEC) on a trial basis for 1983.

The ASC Board of Trustees approved the membership decision in December with the intent of unifying the labor relations efforts on construction industry management, according to ASC.

A major 1983 program of NCEC is to increase cooperation between itself and the Building and Construction Trades Department of the AFL-CIO on a Market Recovery Program for Union Construction.

An agreement between the two organizations, signed in November, will solidify efforts in developing effective local labor-management-owner programs throughout the United States to improve productivity, eliminate wasteful practices, reduce work stoppages and improve public and customer relations.

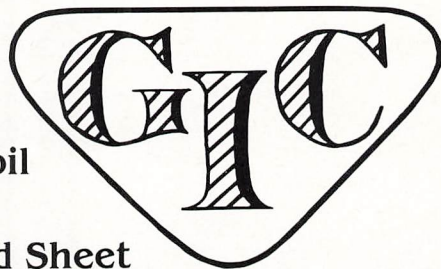
These steps are being taken so that union contractors and organized

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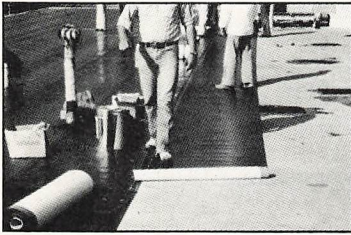
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labor can recapture markets which have been lost to open shop contractors and their employees, according to ASC.

ASC consists of the following associations: Mason Contractors Association of America, Mechanical Contractors Association of America; National Association of Plumbing, Heating and Cooling Contractors;

National Electrical Contractors Association; National Insulation Contractors Association; National Roofing Contractors Association; Painting and Decorating Contractors of America and Sheet Metal and Air Conditioning Contractors National Association.

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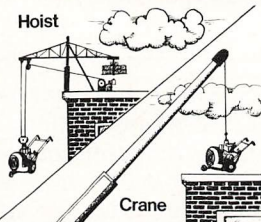
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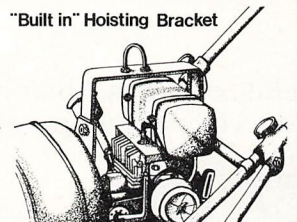
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# Associate News

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## Heyde Named Trumbull's Western Manager

Jack Heyde has been named Western District Sales and Supply Manager at Trumbull Asphalt. He will supervise the development and coordination of the sale of asphalt products in the western United States out of his San Francisco Bay-area office.

Trumbull Asphalt is a division of Owens-Corning Fiberglas Corp. Heyde joined Owens-Corning in 1966 as a Branch Salesman for the Industrial and Commercial Division in Memphis, Tenn., and then moved to Oklahoma City as a Resident Salesman for the division.

He later became Manager of the Mechanical Operating Division branch office in Los Angeles.

Until his recent promotion, Heyde was Market Manager, Metal Building Insulation, Mechanical Operating Division in Toledo, Ohio.

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## J/M Announces Winning Pair



Robert Kurtz, Ark Roofing Co., Sunnyvale, Calif. and Harry Lenhart, an independent roofing contractor in Frederick, Md. are the grand prize winners of custom-equipped Ford Lariat pickup trucks in the Johns-Manville Wholesaler Shingle Sweepstakes.

The J/M Wholesaler Shingle Sweepstakes ran from May 1 to July 31. The sweepstakes was open to all professional residential roofing shingle contracting companies.

Pictured (left to right) are: Frank Kennedy, The Roof Center, Rockville, Md; Lenhart; John Dorsey, Manville Building Materials Marketing Division vice president; Kurtz; and, Ralph Snow, Western Wholesale Distributors, San Jose, Calif.

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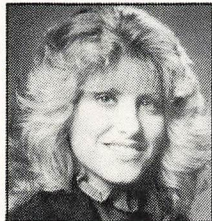
## Carlisle Promotes Six To Top Posts

Carlisle SynTec Systems has appointed six executives to key management posts. The appointments include: Robert A. Brown president; Hugh C. Kenney, senior vice president, marketing and sales; Jack L. Hollis, senior vice president, operations; John H. Ensign, senior vice president, finance and administration; Frank Poley, vice president, sales and Ramon A. Nadal, vice president, personnel.

Carlisle SynTec Systems is a division of Carlisle Corp., a leading manufacturer of single-ply elastomeric roofing, waterproofing and lining systems. Formerly the Construction Materials Division of Carlisle Tire & Rubber Co., Carlisle SynTec Systems became a separate operating company in September 1982.

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## Celotex Names Albano To Advertising/Communications Post



Wendy S. Albano has been named advertising/communications coordinator for The Celotex Corporation, according to Kenneth A. Schweikhart, director of advertising/communications.

In her new post, Albano is responsible for coordinating the preparation and production of all literature and packaging material for Celotex' Roofing Products Division.

An alumna of the University of Florida with a degree in advertising, Albano participated in student internship programs with Richard Reeves Marketing & Advertising and CSM Advertising, both in Gainesville, Florida.

The Celotex Corporation is the major building, roofing and industrial products component of Jim Walter Corporation.

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## Chamberlin Appointed As U.S. Intec Veep

John J. Chamberlin has been appointed Senior Vice President, Eastern Region, for U.S. Intec., makers of Brai roofing and waterproofing products.

Chamberlin will be headquartered at the eastern facility where U.S. Intec is constructing its second modified bitumen membrane plant.

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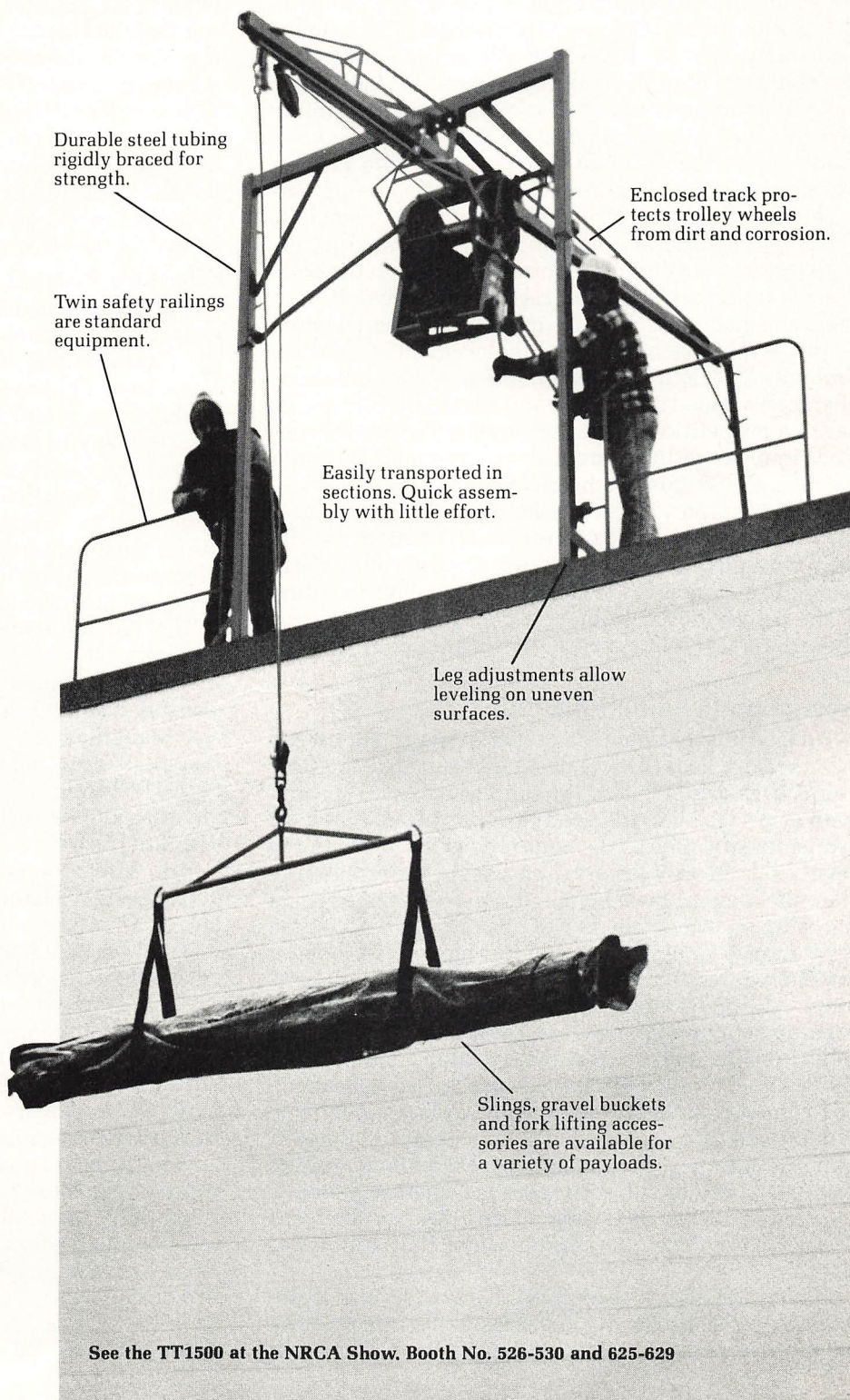
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This column was prepared for *Roofing Spec* by the law firm of Summers, Hendrick, Spanos, Phillips & Grant. The column presents information of legal matters of general interest. The text is necessarily generalized, and you are advised to consult with a professional legal advisor before taking any action.

# The Manville Bankruptcy

**M**anville Corporation filed for voluntary reorganization under Chapter XI of the federal Bankruptcy Code on August 26, 1982. Manville officials stated that the company filed the bankruptcy petition in order to halt the thousands of asbestos-related personal injury lawsuits now pending against the company and to preclude any further asbestos lawsuits. Manville's move, however, also had important implications for purchasers of Manville construction materials. On November 5, 1982, in response to a motion made by Manville, the Bankruptcy Court issued an order stating that the company is authorized to honor, service and satisfy all warranty and guarantee claims — other than personal injury claims — relating to repair and replacement of defective products. The Court's order applies to all warranties and guarantees issued both before and after Manville filed its bankruptcy petition. Manville also is authorized to continue issuing roofing guarantees and bonds and to honor its obligations under such agreements.

The Bankruptcy Court's order will alleviate many of the problems and uncertainties facing contractors who have done business with Manville or who would like to purchase materials in the future. Nevertheless, the filing of the bankruptcy petition will continue to affect purchasers of Manville construction materials in several ways.

## Impact on Pending Litigation

All lawsuits that were filed prior to August 26, 1982 in which Manville is the sole defendant and all claims that could have arisen before the time have been "stayed" with respect to Manville pending approval of Manville's reorganization plan by the Bankruptcy Court. Obtaining relief from the stay prior to approval of the reorganization plan may be possible in circumstances of unusual hardship; however, in practice such relief is granted most often to large creditors holding mortgages, liens, or similar secured interests in property held by the corporation. An organization of the lawyers suing Manville on asbestos-related claims has indicated that it plans to seek relief from the stay so that the asbestos lawsuits may continue. Other types of unsecured creditors equally affected by the stay probably have even less of a chance of obtaining special relief than do the asbestos claimants. Manville attorneys have stated that Manville intends to have all lawsuits currently pending against Manville transferred to the Bankruptcy Court for the Southern District of New York, the court in which the petition was filed.

For lawsuits in which Manville is one of several co-defendants or a third-party defendant, the effect of the bankruptcy petition is less straightforward. The other

defendants may seek a stay of the entire litigation, claiming that the suit cannot be litigated fairly in Manville's absence. On the other hand, the plaintiffs probably will want to continue the suit against the other defendants. This problem will have to be resolved on an individual basis by the trial court in which each action is pending. Last month, a California court refused to stay an asbestos lawsuit with respect to several Manville co-defendants because it concluded that the suit could be pursued fairly against the other defendants in Manville's absence.

## Effect on Present Contracts

The Order issued by the Court regarding building materials, warranties and guarantees has remedied many of the problems that were facing its construction customers. Manville has stated that it plans to continue honoring its supply contracts, and the court order authorizes the company to honor and service all warranties and guarantees whether issued before or after the petition was filed. Nevertheless, there exists some uncertainty regarding the company's ability in the long term to honor such contracts if the bankruptcy reorganization process should not be completed successfully and the company is forced to liquidate.

The federal Bankruptcy Code requires unsecured creditors to file a "proof of claim" to avoid discharge of the debtor corporation's obligations. The Bankruptcy Court issued an Order on November 9, 1982 stating that any Manville creditor whose claim is unliquidated or disputed or was not included on a list of claims submitted by Manville to the Court and who desires to share in any distribution of Manville assets must file a proof of claim on or before a date to be set by the Bankruptcy Court. Some contractors may want to consider filing such a proof of claim with the Bankruptcy Court. For example, a contractor who has had a claim asserted against it on a job in which Manville building materials were used should consider filing a proof of claim.

Contractors who have current unperformed supply contracts with Manville should be aware that contracts cannot be cancelled by the purchaser just because Manville has filed for bankruptcy. The Bankruptcy Code prohibits a company from terminating an agreement solely because the other party has become insolvent or has filed for bankruptcy. Thus, if Manville elects to honor a given contract, the other party remains obligated to perform.

Manville's attorneys have stated that they planned to file a reorganization plan in December, 1982. Final approval of the plan, however, may not occur for as long as five or six years.

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## Avoiding Legal Pitfalls on Out-Of-State Contracts

Contractors and subcontractors who ordinarily perform construction work in more than one state are usually familiar with the requirements of registration as a "foreign corporation" with the Secretary of State in order to do business. However, there may be additional requirements for registration and licensing of which the contractor is not aware. He may not discover these requirements until he finds himself in the position of having to sue the general contractor or owner, or to file a lien on the owner's property in order to collect payments due him under the contract. To his dismay, he may discover that he is not entitled to pursue a lawsuit in the courts of the state where the work was done.

This problem is dramatically illustrated by the recent Georgia case of *Gorrell v. Fowler*, 248 Ga. 801 (1982). A Georgia law requires nonresident contractors or subcontractors performing contracts in Georgia worth more than ten thousand dollars to register with the State Revenue Commissioner and to furnish a surety bond to ensure that all taxes due the State of Georgia will be paid. This registration must be made and the bond furnished even if the nonresident contractor has no employees for whom he must pay employment taxes and does not expect to incur any sales or use tax liability, having brought all his employees and materials in from out of state. *Gorrell* was a contractor who resided in Tennessee, where his contracting business was located and licensed. He had not registered with the Georgia Revenue Commissioner as required by the law. He sued *Fowler*, with whom he had entered into a contract to perform construction work, for payment under the contract.

Relying on a provision in the law that an unregistered nonresident contractor may not maintain an action for payment in the Georgia courts, *Fowler* moved to dismiss the action. The trial court agreed, and the Supreme Court of Georgia upheld the dismissal. The Supreme Court said that the law was constitutional, was not discriminatory against nonresident contractors, and applied not only to contract claims but claims in *quantum meruit*, for the reasonable compensation of the contractor's services. Although the Supreme Court did not specifically discuss claims of lien, the language of their opinion indicates they would apply the prohibition on unregistered nonresident contractors' suits to claims of lien as well as to contract claims.

State and local licensing and registration requirements vary widely, and the consequences of failure to comply differ from state to state. Some states simply impose a fine for failure to obtain and maintain the proper license for construction contracting. In other states, an unlicensed contractor will suffer the same penalty as the

plaintiff in the *Gorrell* case in Georgia: He will be unable to collect payment due him under the contract. State courts applying the licensing requirements have barred lawsuits by unlicensed contractors on the theory that contracts by unlicensed contractors are void and unenforceable (California); or because the law itself declares that unlicensed contractors may not recover (Michigan); and in some states including Georgia, an unlicensed contractor is not even allowed to recover the value or even the cost of services performed (Arizona, New Mexico).

Many states have registration and licensing requirements, some which apply to *all* businesses doing business in the state or others which apply only to contractors. The prudent nonresident contractor or subcontractor should not rely upon the person with whom he contracts to inform him of these requirements: Instead, before commencing work on an out-of-state contract, a contractor should check with at least the Secretary of State (both the corporate department and the business licensing department), the State Revenue Commissioner or Department, and the city and county licensing authorities to make sure that all licensing and registration requirements have been met. As any contractor knows who has been prevented from collecting payment by his failure to comply with such requirements, avoiding such legal pitfalls protects profits.

## Abuse of the Right of Approval

The contract documents between the owner and the general contractor often provide that the general contractor with his bid or "as soon as practicable after award of the contract" furnish in writing to the owner and the architect the names of the subcontractors he proposes to engage for the principal portions of the work. At this point, the contractor has made a tentative selection of the subcontractors to whom he intends to offer subcontract agreements. Indeed, upon submission of the list of these subcontractors and express or implied acceptance of them by the owner, the general contractor may not be able later to substitute any other subcontractors without the expressed approval of the owner or its architect.

The problem in focus here arises when the owner or its architect attempts to exercise a right such as that permitted in AIA Document A-201 General Conditions ¶5.2, or stating promptly in writing to the contractor "whether or not the owner or the architect, after due investigation, has reasonable objection to any such proposed person or entity" as a subcontractor. If such objection is lodged, then the contractor must submit a substitute for the subcontractor to whom the owner and the architect have registered their objection.

Such a provision is not an unrestricted license to the owner or its architect to the arbitrary or vindictive. Unfortunately, a situation is sometimes encountered in which the architect or engineer on a project has had prior

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POLYESTER



**B**ond Grey™ 35 is reinforced with type 787 Celanese Fortrel® polyester yarn manufactured with our own advanced Fiber-Loc™ weave technology. This innovation produces exceptional tear strength, minimum stretch and shrinkage, and impressive seam strength. Our exclusive thermoplastic polymeric alloy is applied with the most advanced coating technology using a combination of our own adhesive systems for superior chemical and mechanical adhesion to the Fiber-Loc weave. The result: the toughest single-ply roof on the market.

Bond Grey™ 35 is manufactured and tested at our modern plant in Pulaski, Virginia. Bond

Grey™ 35 benefits include resistance to high temperatures, flexibility at low temperatures, resistance to most chemicals, and water tightness. In addition, Bond Grey™ 35 is easily installed and shipped in 375 sq. ft. rolls with custom fasteners. Our special heat welder insures superb performance.

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# LEGAL

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dealings with a particular subcontractor in which the two parties did not get along and out of which arose a certain degree of personal animosity or bias on the part of the design professional against that subcontractor. Sometimes this animosity or bias is founded upon a substantial factual basis and, unfortunately, quite often it is not.

When a subcontractor is the subject of such unwarranted bias resulting in its rejection by the owner or architect, there are several avenues of recourse. If the design professional is making false accusations regarding that subcontractor's prior construction experience and abilities, and such accusations result in or influence the determination to reject that proposed subcontractor, this clearly falls within the realm of "defamation" either in oral form as slander or written form as libel. This would subject the design professional to substantial liabilities under "tort" theories for actual damages as well as punitive damages and attorneys' fees. Additionally, to the extent that such false accusations could be reasonably anticipated to and do result in the owner's rejection of the proposed subcontractor, this would constitute a cause of action against the offending design professional as a result of a direct, unlawful and unjustified interference with the subcontractor's prospective contract

rights with the general contractor. E.g., see *Leonard Duckworth, Inc. v. Michael L. Field and Company*, 516 F.2d 952 (5th Cir. 1975).

Even if the design professional making the false accusations is not the project architect but instead a consulting engineer working with the architect as part of the design team, then that engineer subjects himself to essentially the same liabilities as discussed above for any false or unfounded accusations against a particular subcontractor. Moreover, if the project architect denies approval of a subcontractor simply on the basis of unfounded allegations leveled by the consulting engineer against that subcontractor, the architect himself may be violating certain legal rights of the contractually remote subcontractor. As noted above, most subcontractor approval clauses expressly or implicitly require "due investigation" by the architect or owner before such objection can be made. The law is well established that the project architect has an obligation in any case to act in good faith with respect to all parties involved in the construction process. *Lundgren v. Freeman*, 307 F.2d 104 (9th Cir. 1962). In such a case, a good argument could be fashioned that the architect did not act in good faith to the extent that he failed to perform an independent investigation regarding the allegations of his consulting engineer against a prospective subcontractor. This would confer a cause of action against such architect for interference with the subcontractor's prospective contractual relationships, since interference was not justified under the contract documents.



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EPS insulation is the secret of survival these days. Roofing contractors are using three times more EPS now than in 1978. And with good reason. EPS is the most economical insulation on the market.

EPS insulation offers more Rs per dollar than any other roof

insulation. It's highly water resistant. It performs equally well in new and reroof projects, with BUR membranes and single-ply.

It's also the most versatile product available for the job. You can specify size, thickness, and density, even tapered EPS for positive slope-to-drain. Or it's

available laminated with an integral thermal barrier, and/or an overlayment to accept adhesives or hot bitumen.

If you're still surviving without EPS, take a second look. Things could be better.



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**Intelligent solutions**

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# San Antonio's An Original

**S**an Antonio. A city where remnants of a colorful past are juxtaposed with the energy of an even more exciting future.

Located in the heart of Texas, it is a city of almost one million people with a vivid cultural heritage spanning more than 250 years.

A city set firmly in the Sunbelt, San Antonio has definitely prospered from its careful planning, rich Mexican heritage and many gifts of nature.

On a stroll through downtown, one can discover many of the sites for which San Antonio has become famous — the Riverwalk, also called the *Paseo del Rio*; *La Villita* (the Little Village); *El Mercado* (The Mexican marketplace); and HemisFair Plaza.

Also nestled in the heart of the downtown area is the Alamo, where over 180 brave men fought and died in the name of Texas independence. This popular visitor's spot carries memories of the legendary Davy Crockett, Jim Bowie and William Travis.

The San Antonio River meanders its way through the downtown business district, twenty feet below street level. Lined with a lush, subtropical terrain, this deep green waterway is the center of its own community. While strolling along cobblestone paths, one can find an array of European-style sidewalk cafes, specialty boutiques, nightclubs and restaurants of international cuisine.

With an average annual temperature of 68.8 degrees and 300 days a year of clear, blue skies, San Antonio is great for year-round river tours aboard open-air barges or self-powered paddleboats. Groups can float down the river, dining aboard candlelit barges, enjoying the sights and sounds of the river.

While walking along the river banks, one can visit *La Villita*, an original San Antonio settlement. Local artists not only sell their wares in restored historic stone houses located there, but also demonstrate their crafts for spectators.



Founded in 1718 by Franciscan padres as Mission San Antonio de Valero, the Alamo is undoubtedly the city's most famous landmark. In 1836, during the Texas war for independence, the Alamo was the scene of one of the most heroic but tragic events in the history of the United States. All 187 Texas soldiers were killed while besieged by Mexican troops under General Santa Anna.



Mission San Jose, San Antonio's largest and most impressive mission, found along historic Mission Trail.

Once on the street level, open-air wooden trolleys or horse-drawn carriages are available for touring downtown. One of the city's well-known downtown sites is HemisFair Plaza, home of the 1968 World's Fair and location of the 750-foot Tower of the Americas. From the revolving restaurant or the observation deck at the summit of the Tower, one can see the city spread beneath as it gradually fades into the Texas Hill Country.

The choices of places to see and things to do in San Antonio are many. Visitors can spend a quiet afternoon touring the new San Antonio Museum of Art and in the evening catch an exciting Broadway show. A cool, clear morning can be spent at San Antonio's internationally famous zoo followed by a short walk to the nearby Oriental-style sunken Gardens. Or one can step back into Texas history at the Witte Museum which houses the Museum of Natural History and archaeological exhibits. Later catch a glimpse of the 27 different ethnic cultures represented at the Institute of Texas Cultures located on HemisFair Plaza.

The city's close proximity to Mexi-



Mark Twain once called San Antonio, "one of America's four unique cities." Although the downtown skyline has changed considerably since Mr. Clement's day, it still retains a distinctive flavor as the third largest city in Texas.

co is most evident at El Mercado, San Antonio's bustling Mexican marketplace. The cobblestone pedestrian mall is complete with arts and crafts shops, clothing boutiques, jewelry stores, restaurants and a farmer's market — all with a "south of the border" flavor. Sounds of traditional Mexican mariachi or other musical groups can most always be heard as one dines on Mexican food.

South of the city near the San Antonio River are historic eighteenth century Spanish missions. Established by Franciscan Friars, the four missions are still active churches. An inspiring mariachi mass is celebrated each Sunday at San Jose Mission. San Jose is the largest and most elaborate of San Antonio's missions but each of the four has its own charm.

History buffs especially can enjoy the elegant King William Historical District. The stately, restored Victorian mansions were built in the late 1800s by wealthy German merchants.

The city's hotels and motels reflect the various cultures and lifestyles represented in San Antonio. Architectural styles vary, ranging from the very large and modern to the quaint and historic Spanish mode.

For the sports-minded, the city boasts beautiful golf courses and tennis facilities which are easily accessible to hotels, jogging trails along the River Walk and horseback riding in Brackenridge Park. And one can join in the contagious merriment and not-too-genteel whooping and hollering at one of the NBA Spurs basketball games. Or one can visit the prestigious Retama Polo Center, a spectacular facility that is easily the largest polo center in the United States.

San Antonio has the advantages of a major city, the diversity of many cities, and the originality of only one city. It is a truly charming place of history and tradition, carefully blended with cosmopolitan progress.





# 1983 NRCA Convention Exhibitors

**Aeroil Products Co., Inc.** (304) will feature its equipment systems for the single-ply applicator including high reach hoists, special conveyors for ballast stone, rubber-roll handlers and spotters for EPDM applications and propane torches, hoists and carts for modified bitumen installation.

**A.G.R. Co.** (262) will highlight ALPHAGARD, a single-ply roofing membrane of 60 mil polyisobutylene made with a self-sealing side lap and a fleece backing for bonding purposes.

**AHI Roofing International** (1109, 1110) will unveil its DECRABOND Roofing System. Each DECRABOND panel, covering five square feet, has a profiled steel base resembling traditional tiles and is finished with a decorative coating of natural stone granules.

**Alcoa Building Products, Inc.** (702, 704, 801, 803) will present ALCOA VENT-A-System, a ventilating system that saves energy, and ALCOA COUNTRY CEDAR SHAKES which give the look of wood without the problems of wood.

**Alkor Division, The Solvay American Corp.** (556, 558, 560) will feature its Alkorflex line of CPE based membranes and Alkorplan, a loosely-laid flexible PVC roof membrane.

**Allied Protective Coatings, Inc.** (849).

**American Associated Companies, Inc.** (640, 642) will exhibit its line of manufactured roofing products, including the Tarzan fiber glass and cotton mops, small tools and equipment.

**American Hydrotech, Inc.** (1005) will present its Liquid Membrane 6125 waterproofing for plaza decks and foundations, the Protected Roof Membrane for roofing applications and Hydro-Seal E.P.D.M. sheet rubber roof membrane encompassing either a ballasted, fully adhered, mechanically fastened or IRMA installation.

**American Roofing Corp.** (1049) will feature Modified Bituminous Membrane which includes 4mm ARC Premium and 4mm ARC Granular — both are polyester reinforced — and 4mm ARC Aluminum which is fiber glass reinforced.

**American Weatherproofing, Inc.** (859).

**American Western Mfg.** (902, 904).

**Apache Building Products, Co.** (434, 436) will introduce White Line Plus, a uniquely faced isocyanurate insulation for recover, separation or venting built-up roofing applications in addition to "SAM," Self-Adhering Membrane.

**ARCO Chemical Company** (204) is displaying its line of expanded polystyrene (EPS) insulation for use in roofing systems. Contractors will have an opportunity to learn about the cost effective use of EPS insulation in both BUR and single-ply membrane systems.

**Arkseal, Inc.** (907).

**ARNCO** (759) will present its *Rubberron*, a reactive urethane system combining high quality prepolymers with selected rubber chips. Rubberron can be applied by hand or sprayed in one application to make damage and slip resistant pathways on various surfaces.

**Asphalt Products Oil Corp.** (839) will present a selection of asphalt roof coatings and cements along with protective roof products and four different waterproofing systems.

**Associated Foam Mfg., Inc.** (158, 160) will present its custom-engineered Contour Taper Tile® roof drainage system for both new construction and reroofing. Taper Tile® is compatible with both built-up roofs and single-ply systems for insulating and draining flat roof decks.

continued on pages 38, 44, 46, 48, 50, 52, 54, 56, 58, 60,  
64, 66

# The Tough One

Hi-Tuff® single-ply membrane roofing is tough all over – on the surface, at the seams, and inside the sheet.

Hi-Tuff is made from DuPont's "Hypalon" synthetic rubber, known for its long-term weatherability and elasticity. There's no shrinkage or embrittlement with Hi-Tuff.

And, even though Hi-Tuff

is rubber, it can be hot-air welded on the roof, unlike conventional vulcanized rubber membranes with cemented seams.

Hi-Tuff membrane, internally reinforced with high-strength scrim, is mechanically-attached and needs no ballast. It's quickly installed and can be easily inspected at any time

Owners like its reliability, and many choose it for its white surface and light weight. Hi-Tuff is a complete, carefully-engineered roofing system.

For complete information and a free sealed sample of Hi-Tuff Roofing, contact Roofing Systems, J.P. Stevens & Co., Inc., Easthampton, MA 01027. (413) 527-0700.

## Hi-Tuff® Roofing

Everything a roofing system should be.

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...IN REROOFING AND  
NEW CONSTRUCTION!**



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IN ROOFING!**



# Field Tests on Roof Aggregates Reveal New Data

by Robert A. LaCosse  
NRCA Director of Technical Services

Recently, NRCA examined asphalt flood coat application and gravel adherence. The results, while not too surprising, are revealing and need to be shared with the roofing industry.

According to the *NRCA Roofing & Waterproofing Manual*, an asphalt flood coat should be applied at a rate of 60 pounds per 100 square feet with a gravel surfacing of 500 pounds per 100 square feet. A tolerance of plus or minus 25 percent (on a total-job average basis) is suggested on either of these recommended quantities.

It has been proposed in the American Society for Testing and Materials (ASTM) that ASTM D-1863, "Standard Specification for Mineral Aggregate Used on Built-up Roofs" include a minimum aggregate adherence requirement of 50 percent. The recently revised ASTM Standard D-1863 specifies that Nos. 6, 7, and 67 sized aggregate, which are described in ASTM D-448 "Standard Specification for Standard Sizes of Course Aggregate for Highway Construction," may also be used as options to the single size that had been previously speci-

**TABLE I**  
**GRAVEL ADHERENCE FIELD TEST**  
**AVERAGE OF THREE SAMPLES PER RUN**  
**WEIGHTS EXPRESSED AS LB PER 100 SQ. FT.**

	No. 6		No. 7		No. 67		D-1863		
	1	2	3	4	5	6	7	8	9
Aggregate No. ....									
Run No. ....									
* Type of Aggregate Spreader	M	H	M	H	M	H	H	H	H
Asphalt Weight .....	53.9	65.9	54.5	57.1	64.1	60.6	61.3	61.1	56.6
** Variability .....	7.2	26.7	6.7	7.1	19.2	19.1	16.3	5.9	17.4
Total Aggregate Weight .....	415.0	580.9	395.8	467.8	361.1	360.9	421.0	431.7	436.7
** Variability .....	50.7	218.2	64.5	168.8	163.9	57.5	258.5	146.2	231.1
Adhered Aggregate Weight ....	289.6	360.2	262.9	301.2	297.0	315.3	279.4	311.4	242.4
** Variability .....	36.2	79.7	26.6	59.9	129.2	38.2	39.0	33.6	58.0
Aggregate Adherence, % .....	69.8	64.3	66.6	65.1	82.8	87.7	70.3	73.6	59.9
** Variability .....	0.7	36.8	7.6	10.9	11.1	15.7	32.6	23.7	43.5

\* M - Mechanical Spreader, H - Hand Spreader

\*\* Variability-Difference between high and low values for 3 Samples

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## NATIONAL NEWS

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### Consumers Expect Better Buying Ahead

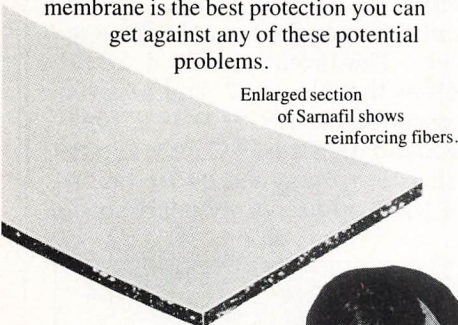
The consumer confidence index

was up five points in November to 54.7 reflecting growing hopes for American business and employment conditions, according to the Conference Board.

A reduction in inflation and declining interest rates appeared to be "strong contributing factors" to increased consumer confidence, said Fabian Linden, executive director of the board's consumer research center.

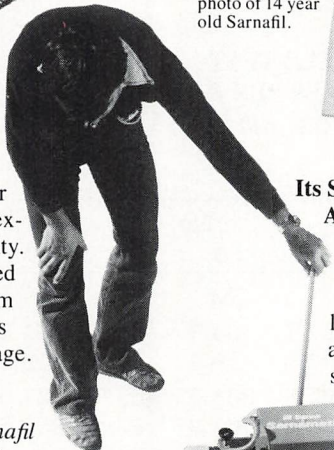
## Sarnafil® Single-Ply Roofing NO SHRINKAGE NO EMBRITTLEMENT NO PROBLEMS

Outside of accidental damage and improper design or installation, there are only about three things that can happen to single-ply roofing membranes • They can shrink and as a result tear or pull away, causing leakage • They can become brittle or deteriorate with age • They can fail at the seams due to inadequate seam bonding. Sarnafil PVC roofing membrane is the best protection you can get against any of these potential problems.



Enlarged section of Sarnafil shows reinforcing fibers.

**It Won't Shrink... Ever.** Manufactured by a special process that flows the PVC completely around a non-woven fiberglass or polyester reinforcement, Sarnafil has exceptional dimensional stability. Unlike extruded or calendered products, Sarnafil is free from manufacturing stresses and is reinforced to prevent shrinkage.

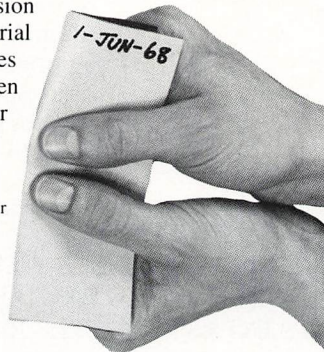


Get complete details on Sarnafil Single-Ply Roofing. Circle the reader's service number or write today for our illustrated brochure. Sarnafil (U.S.) Inc., Canton Commerce Center, P.O. Box 380, Canton, MA 02021.



**It Won't Get Brittle or Deteriorate with Age.** The only way any manufacturer can make this claim is to have actual installations in place for many years in all climatic conditions. Sarnafil PVC membranes retain their plasticizer even after years of service. Samples taken from early installations retain their original pliability and can be folded or even creased without surface cracking. The excellent aging properties of Sarnafil membranes allow the fusion of new material to membranes that have been in service for many years.

Unretouched photo of 14 year old Sarnafil.



**Its Seams Don't Depend on Adhesives, Chemicals or Sealants.** Hot-air-welding fuses overlapping sheets of Sarnafil into a continuous leakproof roof. There are no adhesive or chemically bonded seams to fail and no additional costs for chemical or adhesive seam bonding materials. Manufacturers of other roofing membranes recommend hot-air-welding as a means of correcting gaps in adhesive and solvent-

welded seams. Sarnafil gets it right the first time!

**Sarnafil® Reinforced Membranes**  
"Living up to the promise of single-ply roofing"

## Be Wary of Insulation As BUR Substrate

Roofing contractors should watch the use of roof insulations as a substrate for BUR, cautions the Asphalt Roofing Manufacturers Association (ARMA).

The ability of a given roof insulation to provide a satisfactory substrate has a direct effect on the performance of the BUR membrane, according to ARMA.

ARMA's Built-Up Roofing Committee recently released a warning on the use of untested insulation materials.

Insulation used in BUR systems serve two purposes; to provide thermal insulation for a building, and to provide a base or substrate for the attachment and support of the built-up roofing membrane.

A copy of the bulletin, "Recommendations Regarding Use of Roof Insulations as a Substrate for Built-Up Roofing," is available from the Asphalt Roofing Manufacturers Association, 1800 Massachusetts Ave., N.W., Suite 702, Washington, D.C. 20036.

## ASTM Releases Standards Book

The 19th edition of "1981 ASTM Standards in Building Codes" by the American Society for Testing and Materials is now available.

The two-volume publication contains specifications, test methods and definitions of building codes.

Topics covered include acoustical materials, cement, concrete pipe, fences, iron and steel castings and thermal insulating materials.

All ASTM Standards referenced in building codes of states, cities and municipalities are included, as well as all standards in national model codes such as the Basic Building Code, Uniform Building Code, Southern Building Code, National Building Code and the National Code of Canada.



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**Xtra:** fire resistance properties  
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**Xtra:** dimensional stability... more stable than other foam insulations

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# Field Tests

continued from page 29

fied. The change was made because the aggregate gradation specified in earlier versions of D-1863 is not readily available in all parts of the United States and the new sizes are considered to be suitable for use as roofing aggregates.

The NRCA Technical Operations Committee (TOC)

## **Mechanical spreaders offered greater uniformity than hand-operated spreaders.**

suggested that additional data and information were needed concerning asphalt flood coat and aggregate surface application rates to validate the NRCA *Manual* recommendations and the recent ASTM revisions on aggregate sizes. Further, the proposed testing program would offer the opportunity to determine if the proposed ASTM requirement for minimum aggregate adherence values of 50 percent was realistic.

In response to the TOC suggestion, Bill Kugler, United Materials, Inc., Denver, Colo. provided his com-

pany's facilities and staff to carry out the field testing. Chicago Testing Laboratory was selected to perform the sample analysis.

In the sample preparation phase of the program, a clean, level area of approximately 40' x 60' was selected. A kraft paper cover was applied with about a two inch lap, nailed approximately 18 inches on center along the side lap and ends to secure it. A No. 15 asphalt saturated felt was then laid perpendicular to the laps of the kraft paper and this was secured by nailing every 18 inches. Care was taken so that the surface was free of any wrinkles or buckles and was sufficiently smooth to receive the application of the asphalt and surfacing aggregate.

The asphalt for the flood coat was supplied from a tanker containing ASTM D312 Type II Roofing Asphalt maintained at a temperature of 475 °F. The aggregate for the tests was supplied from four trucks each containing one of the specified grades of gravel, described in ASTM D-1863 including No. 6, 7 and 67.

An initial run was made to clear the asphalt spreaders and to allow the operator to acclimate himself to the test conditions.

Each test run was approximately two feet wide located over the center portion of the three foot width of test surface leaving at least one foot separation between each test run application. The length of the applied test run was about 50 feet which gave an area of about 100 square feet.

The first application, designated as Run No. 9, was made with the conventional D-1863 aggregate using a hand-operated spreader containing about 60 pounds of asphalt. At the point of application the asphalt was maintained at a temperature of 395 °F well within the 25 °F tolerance of the equiviscous temperature (EVT). The operator applied the asphalt in accordance with good roofing practice as he would in a normal field application to achieve a rate of about 60 pounds per 100

## **Test was designed to determine if proposed ASTM requirement for gravel adherence was feasible.**

square feet. In this case the aggregate was applied by a hand-operated gravel spreader filled to capacity with approximately 400 pounds of conventional D-1863 aggregate.

The remainder of the test runs were made with the asphalt spreader filled to capacity. The added weight in the asphalt spreader appeared to give a more uniform distribution of the asphalt which is comparable to actual field practice. Two test runs with the conventional D-1863 aggregate were then applied using the hand-

continued, page 34

# VERMONT ROOFING SLATE

All Colors  
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Semi-Weathering  
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Mottled Green  
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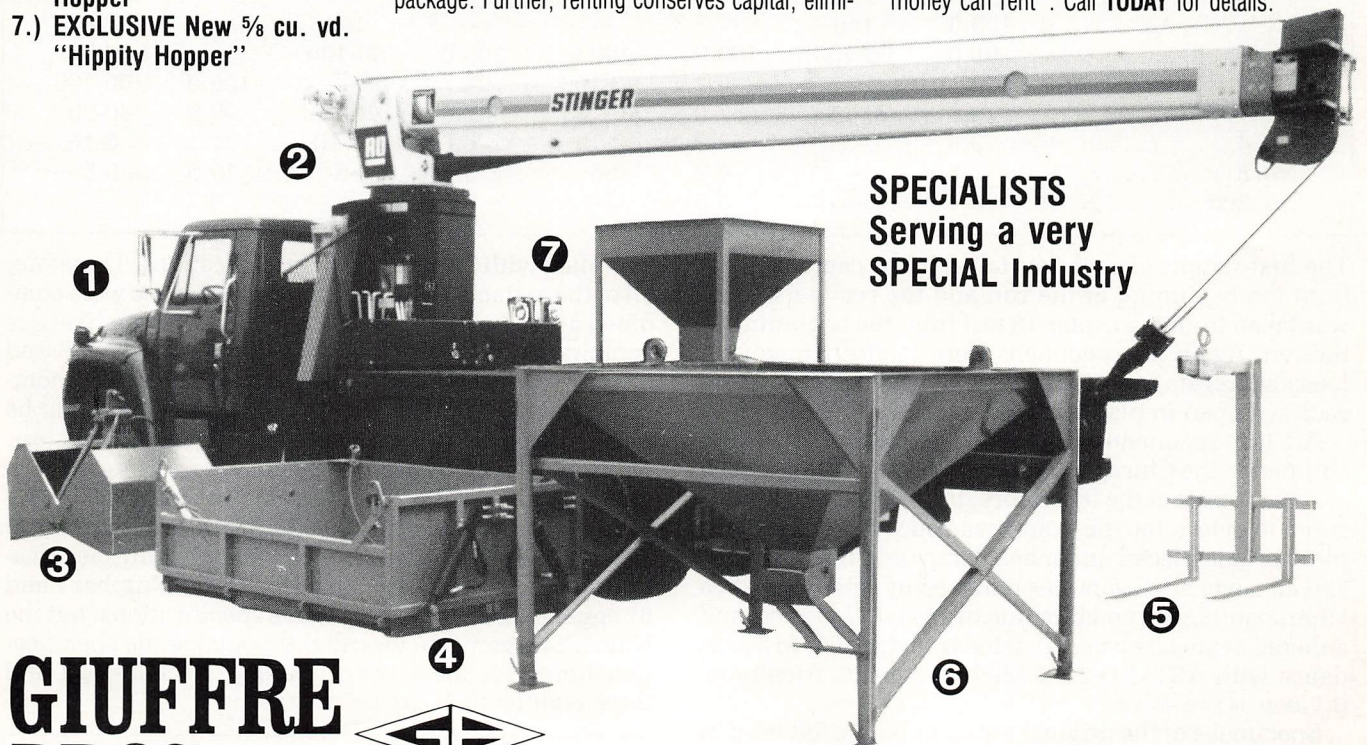
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- 7.) EXCLUSIVE New 5/8 cu. vd. "Hippity Hopper"

Renting, one of many creative financing programs we've developed, makes your dollars work as hard as you do. In fact, the **right** answer to your equipment needs just might be renting our Roofer's Package. Not only is it the **right** equipment for the **right** job, you rent **only** as long as necessary. And renting for \$9.99 per hour makes real sense. Here's **why** and **how**. Giuffre Brothers are **No. 1** in crane rentals/sales and offer the **No. 1** equipment package. Further, renting conserves capital, elimi-

nates financing charges, provides tax benefits, protects against obsolescence, is a hedge against inflation, fits budget parameters, has flexible terms, furnishes **use of** rather than ownership and assures liquidity of cash sources. Plus, we service what we rent and supply answers only almost 20 years of experience can. All advantages considered, renting could be the correct alternative. We like to say, "See Giuffre Brothers for the best crane money can rent". Call **TODAY** for details.



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# Field Tests

continued from page 32

operated asphalt and gravel spreaders.

Next, additional test runs were made using the No. 6, 7 and 67 aggregates respectively. One run with each of these aggregates was made with a hand-operated aggregate spreader and one run with a mechanical-operated aggregate spreader again filled to capacity (approximately 600 pounds) for each run.

The gravel at the time of application appeared to be damp to the touch, but did not contain any free water. The temperature of the asphalt at the time of application for all runs was well within the EVT tolerance of plus or minus 25°F.

Upon completion of the test runs, the strips were allowed to cool for approximately 1½ hours. One sample from the center of each strip was taken approximately 38 feet from the beginning of the run. The samples were cut with a saw equipped with a carborundum blade. The sample was carefully removed and turned upside down over a cardboard box and gently tapped from the bottom to remove loose gravel. The sample was then placed in a polyethylene bag and labeled.

The day after the construction of the test strips, two additional 12" x 12" samples were cut from each strip.

was determined by deducting from the total weight of the test cut the weight of the extracted aggregate and roofing felt.

The loose aggregate stored in the plastic bags was weighed. It was assumed that all the aggregate in the

## ***Not all sizes of aggregate are available across the United States.***

bags was the total that became loose when the samples were inverted in the field and represented the non-adhered portion.

The results of tests on the three samples from each run showed considerable variance as one would expect. Table I gives the average values from each test run and the variability which is the difference between the low and high values. For convenience, all weights were converted to a basis of pounds per 100 square feet.

A question arose as to whether the cover aggregate

**TABLE II  
SIEVE ANALYSIS OF AGGREGATES  
PERCENT PASSING CUMULATIVE**

Sieve Size	No. 6		No. 7		No. 67		Old D-1863	
	Applied	Spec.	Applied	Spec.	Applied	Spec.	Applied	Spec.
1" .....	100.0	100	—	—	—	100	—	—
3/4" .....	99.0	90-100	100.0	100.0	100.0	90-100	—	100.0
1/2" .....	58.4	20-55	96.2	90-100	94.7	—	100.0	90-100
3/8" .....	20.4	0-15	57.9	40-70	42.9	20-55	99.9	40-70
No. 4 .....	3.5	0-5	8.9	0-15	6.0	0-10	31.1	0-15
No. 8 .....	2.5	—	4.2	0-5	3.6	0-5	10.6	0-5
No. 200 .....	0.4	—	0.5	—	0.3	—	0.7	—

The first sample of each was taken in the center six feet from the beginning of the run and the second sample was taken from the center 18 feet from the beginning of the run. Again the specimens were carefully removed, loose aggregate collected as previously described and each wrapped in plastic and identified.

All test specimens were then carefully boxed and shipped to the Chicago Testing Laboratory for analysis.

After receipt at the laboratory, the samples were measured to determine the exact area and weight. The sample was then placed under heat lamps and the flood coat and all cover aggregate was removed by scraping with a large spatula. The combination of asphalt flood coat and adhered aggregate was separated by extracting in accordance with ASTM D-2172 Method A using trichloroethylene as the solvent.

Specimens of the original asphalt organic felt used in the tests were weighed. The weight of asphalt flood coat

complied with the graduation specifications. Therefore, all of the extracted aggregate of the same type were combined and all of the loose aggregate of the type likewise combined and a sieve analysis performed on each. Based on the proportions of adhered-to-loose aggregate, a combined graduation was then calculated which would be representative of the aggregate applied in the field test. Table II gives the results of these sieve analysis as well as the respective ASTM specification for each type.

The sieve analysis showed that the conventional ASTM D-1863 aggregate did not comply with specifications. It appeared to be high in fines. The Number 7 and 67 aggregate met their respective specifications, but the Number 6 aggregate was slightly outside the specification limits for the amount passing the half-inch and three-eighths-inch sieves.

continued, page 36

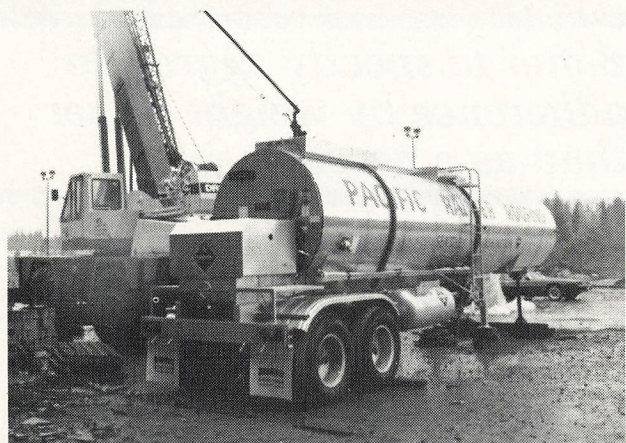
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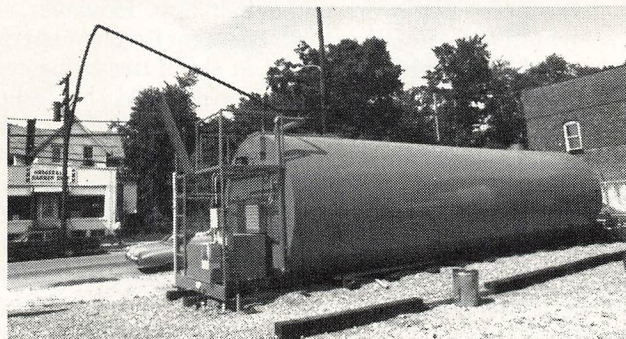
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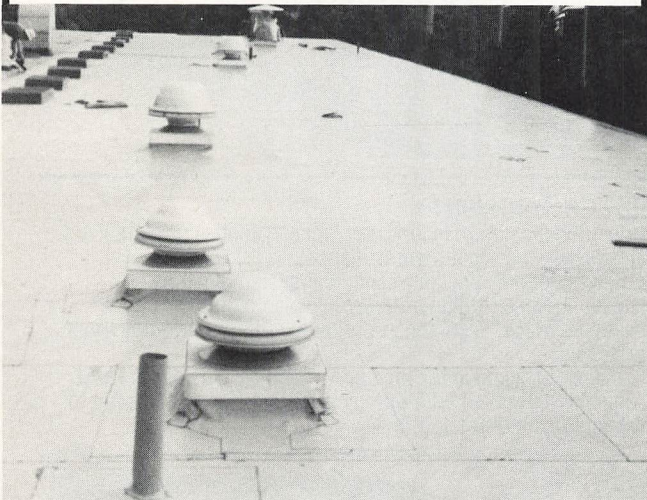


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## Field Tests

continued from page 34

From observations at the test site and an analysis of the data obtained the following conclusions can be made:

- The roofing crew was instructed to apply the asphalt at a normal rate of 60 pounds per 100 square feet. The *NRCA Manual* permits a tolerance of  $\pm 25\%$  on a total-job average basis. The results from the field test showed that the average of the three test specimens from each run was within the *NRCA Manual* recommendations.
- The *NRCA Manual* suggests a top pour coat of asphalt be applied at a rate of 60 pounds per square with an allowable tolerance of  $\pm 25\%$  on a total-job average basis. The test results showed that under field conditions, these are reasonable limits to insure proper coverage and aggregate embedment.
- The *NRCA Manual* suggests aggregate be applied at a rate of 500 pounds per square within a tolerance of  $\pm 25\%$  on a total-job average basis. The test results indicated that, although a large variance in amount existed, the application of No. 6, No. 7 and the conventional D-1863 aggregates fell within the suggested ranges. On the other hand, aggregate No. 67 fell somewhat below the acceptable tolerances. Obser-

### ***Better to specify aggregate adherence by weight rather than as a percentage.***

vations at the test site indicated what appeared to be adequate coverage for all types of aggregate at the actual amount applied. The conclusion can be made that all aggregates used in this study are satisfactory for roof surfacing aggregates.

- The mechanical-operated spreaders appeared to provide more uniformity in aggregate application than that obtained by using hand-operated spreaders.
- An analysis of the test data indicates that a correlation exists between the amount of adhered aggregate to amount of asphalt and aggregate applied. In each case the percent (calculated on the percent by weight of total amount of aggregate applied) was considerably higher than the proposed 50 percent.

If the percent value was calculated on the amount of aggregate specified i.e., 500 pounds per square, the percentages are somewhat less. However, all would still fall above the 50 percent limit except test run No. 9 which would be at about the 48 percent value. The results also indicate that it may be the better practice to specify aggregate adherence by weight rather than by a percentage. For example, in the cases of aggregates D-1863 which now include No. 6, No. 7, and No. 67, an embedment of 200 pounds per square with reasonable tolerance to accommodate application and test variability appears to be realistic.



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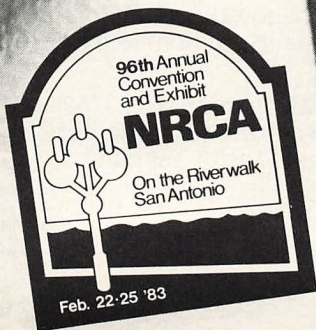
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## '83 Convention Exhibitors

continued from page 26

**Atas Aluminum Corp.** (1055, 1057) will display its ATAS roofing system, which is an aluminum or steel "batten" style panel with an interlocking joint. All the fasteners are concealed by the "batten" rib of the successive panel.

**Atlas Building Materials** (1028, 1030, 1032) will spotlight its asbestos-cement roof decks which are economical and lightweight. Atlas will also present its cladding and promenade tiles.

**Ball Metal & Chemical Co.** (703, 705) will feature Ball Microzinc 70 and Microzinc 80 Batten Seam and Standing Seam Roof Systems. Ball will also exhibit its new snap-on, batten mansard-fascia system and the complete line of Ball/Rollformer Standing Seam and Batten Seam Rollforming Equipment.

**The Barra Corp.** (125, 127).

**Belroof International Inc.** (1026).

**Julien P. Benjamin Equipment Co.** (544, 546, 548, 643, 645 & 647) will exhibit the American Paus Hoist, the Reddi Aluminum Broomin' Forward Rolling Feltlayer, the improved powered feltsitter and big bed Rover 4 wheel material cart.

**Benoit, Inc.** (618, 620, 622, 624) will be showing its EPDM Roofing System, comprised of large talcless EPDM sheets up to 32' in width featuring the Benoit Super Seam.

**Berridge Mfg. Co.** (357).

**Berryfast, Inc.** (818, 820) will feature its two roofing systems. Insulfast is a patented system for pneumatically securing roof insulation to steel decking. Tapefast uses tape and heavy-gauge staples to hold the base to a nailable deck.

**The Bilco Co.** (648) will introduce the new, patented BILCO LadderUp (LU-1) and feature its Model DSH 4848AA double-leaf aluminum Fire Vent with the patented BILCO "Thermolatch" release.

**Bitumec SRL** (1045, 1047)

**Bituminous Materials Co., Inc.** (715) will present its roofing emulsions ALUMNI-GUARD™ and MASTI-GUARD™. Both products can be applied with a pump, brush or spray and won't settle or separate.

**Blackwell Burner Co.** (218) will display asphalt kettles, roof scratchers, a roof sweeper, a 68' conveyor, a roof saw, a power graveller, a 1,500 pound monorail hoist and several accessory items of equipment.

**Boato Tecsystem S.p.A.** (1051) will feature a scale model of a complete single-ply production plant. Boato of Monfalcone, Italy is a manufacturer of modified bitumen membrane plants.

**Bond Cote Systems** (233, 235) will show its Bond Grey™35 single-ply roofing system which is made out of an exclusive thermoplastic polymeric alloy, reinforced with Fiber-Loc™, a high tenacity, low elongation Celanese Fortrel® Polyester fiber.

**Bowe Co., Inc.** (410) will present "Dibiten," a one ply modified bitumen roofing product manufactured in Italy and imported by Bowe. Dibiten consists of a polyester core material on which a 12 year manufacturer's warranty applies and a fiber glass core material having a five-year warranty.

**Briggs & Stratton Corp.** (1007) will exhibit its air-cooled I/C Series industrial commercial engines, available 3 to 18 H.P., featuring cast iron cylinder sleeves, ball bearings, dual element air cleaners, stellite exhaust valves, seats and rotators and chromed pistons.

**Buildex Division/ITW** (152, 154, 251, 253) will demonstrate a variety of fasteners and tools used in the mechanical attachment of roofing insulation and single-ply roofing membranes.

**Cal-Shake** (656). The Shake Co. will present its Cal-Shake lightweight roof shakes, which come in three colors, aged cedar, natural and off white.

**California Tile Corp.** (1029, 1031) will exhibit a broad range of styles and colors of high density, extruded concrete roofing tiles and accessories. Lifetile will also feature its new ultra lightweight Litetile and Lite-shake vinyl roofing panels.

**Carboline Co.** (562) will feature its single-ply sheet membranes including Carboline PIB, EPDM 456 and EPDM 600, and its Chem-Elast™ elastomeric coatings for urethane foam.

**Carex, Inc.** (761) will demonstrate the various ways to use the Sanyo Oscillator DA 2500 and the Physical Modulator.

**Carlisle Syntec Systems** (252, 254, 256, 351, 353, 355) will present its roofing and reroofing systems, including the Mechanically Attached Roofing System, M.A.R.S. Carlisle offers a total system from the deck up with technical and customer services.

**Carpenter Chemical Co.** (951) will exhibit its Warranted Insulative Polyurethane Foam and Elastomeric Roofing and Reroofing System. Carpenter also offers application equipment, field technology and products to assure proper start up and/or field application.

**Celotex Corp.** (404) will exhibit its broad line of commercial and residential roofing products, featuring Celo-I™ One-Ply Roofing System, Built-Up Roofing, Waterproofing & Dampproofing Systems, Roof Insulations and one of the broadest lines of Residential Roofing Shingles.

**Celotex-Marley, Inc.** (132).

**CertainTeed Corp.** (210) will highlight Certaglass, an asphalt impregnated fiber glass built-up roofing ply sheet, used as a mopping ply in built-up roof membranes. In addition, CertainTeed will also present a wide selection of quality roofing products, offering both Class "A" and Class "C" fire resistance ratings.

**Ciro Roofing Products of Canada Ltd.** (1006) will present its Ciro-Seal line of roofing products. One of the products highlighted is Ciro-Seal 2000, an impermeable thermoplastic membrane extruded and finished in sheets.

**Clark-Cutler-McDermott Co.** (752) will exhibit CLAR-MAC-RM, a non-woven fabric consisting of polyester mat impregnated with asphalt.

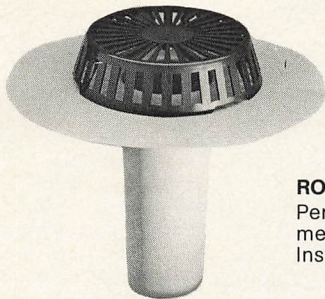
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# eterno

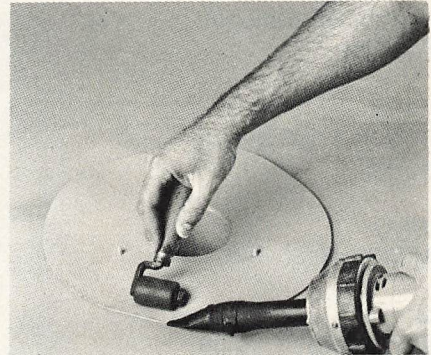
## ROOFING ACCESSORIES

new construction and reroofing

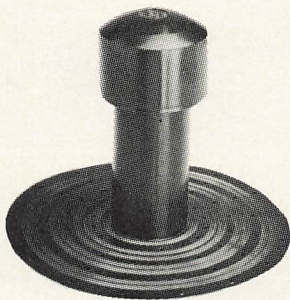
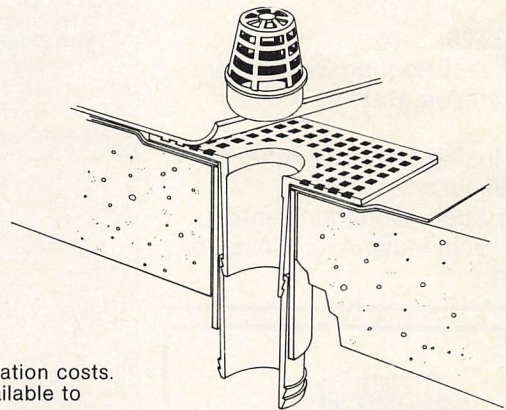
economical



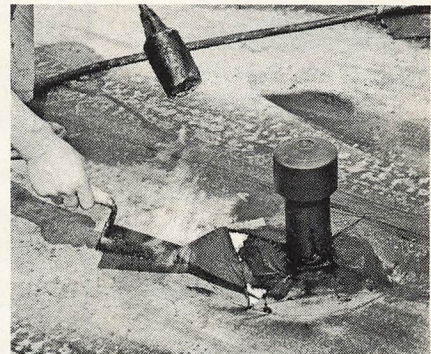
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96th Annual NRCA Convention  
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## March 8-11

RIEI Seminar, Orlando

## March 11-14

Associated General  
Contractors of America, Atlanta

## March 12

NRCA Management Conference,  
(Contractor Operations),  
Los Angeles

## March 13-17

ASTM C-16, Lake Buena  
Vista, Fla.

## March 14-17

ASTM D-20, Nashville

## March 24

NRCA Roofing Systems  
Conference, Charlotte, N.C.

## March 23-25

Northeast Roofing Contractors  
Association, Boston

(For inclusion of events, address  
all correspondence to:  
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## NRCA Report

# Association Forges Ahead With New Projects

by Bill Good  
Executive Editor

Convention time, believe it or not, is upon us, and here's the latest: The trade show of 545 booths is now sold out, with a waiting list for booths; pre-registrations total over 2,200 - about on par with last year; Hyatt and Marriott hotels are officially sold out.

San Antonio week will also feature PAC party, with dinner, dancing, and entertainment featuring country/western singer Moe Bandy. We've had good response.

The Education Operating Committee met in December to discuss and review worker training materials and their pricing. First new program -Kettles and Tankers - will be available in both slide and cassette, and video tape formats early this year. The program is comprehensive, and includes instructor materials and student manuals. It's the first in a series being contemplated by the Op-

erating Committee; Education Director Alan Grayson is developing and producing them.

V.P. Mike Alcock and Executive Director Bill Good attended semi-annual Board meeting of Associated Specialty Contractors (ASC) last month; ASC is a federation of eight national subcontractor organizations. ASC also met with American Subcontractors Association (ASA), Associated General Contractors (AGC). Highlights: ASC voted to join National Construction Employers Council (NCEC) as a group; nearly all ASC members had resigned from NCEC individually in the last couple of years. Also, ASC, ASA and AGC agreed to resume negotiations on a tripartite subcontractor agreement form; negotiations had broken down earlier this year.

NRCA group then met with AGC reps. We'll be putting a program on at the AGC Convention in March, where we'll also be exhibiting; AGC was asked to support NRCA's Accredited Roofing Contractor program

and *NRCA Roofing Material Reference and Guide*; drafts were presented and discussed on job-site responsibilities and pre-qualification form.

First liaison meeting was held in mid-December with Single-Ply Roofing Institute (SPRI) at the NRCA offices. SPRI is pursuing some requests from NRCA Health and Safety Committee on labelling of solvents and adhesives; they have been asked to input into production of "Single-Ply Supplement" for the *NRCA Roofing and Waterproofing Manual*.

Seventh Conference on Roofing Technology, April 14-15, is progressing nicely, with all twelve papers now completed and in the final editing process. Papers will be published in a hard bound book, as in the past.

Technical department has, after several months of discussion, established formal liaison with Air Conditioning and Refrigeration Institute. Discussions have centered around problems with leaky roof-top equipment.



# NRCA and Union Develop Warning Line Slide Show

What roofing mechanics don't know about "The Warning Line" could hurt them.

The United Union of Roofers, Waterproofers and Allied Workers in conjunction with the National Roofing Contractors Association (NRCA) has developed a sound-slide presentation on the use of roofing safeguards.

The 12-minute safety training film, "The Warning Line," is available through the NRCA Service Center

for \$65 per set which includes approximately 80 slides and an audio cassette.

Also included in the presentation is a discussion of the Motion Stopping Safety System which incorporates the use of safety belts, railings, catch platforms and scaffolding.

For more information on obtaining "The Warning Line," contact the NRCA Roofing Service Center, 8600 W. Bryn Mawr Ave., Chicago, Ill. 60631.

## Navy Report Favors Foam

Polyurethane foam is one of the best insulators available, according to the Naval Civil Engineering Laboratory in Port Hueneme, Calif.

The Navy released its report, "Thermal Conductivity of Weathered Polyurethane Foam Roofing," which details an investigation of the decay in the thermal conductivity of polyurethane foam (PUF) with time.

R.L. Alumbaugh, Ph.D., who co-authored the report with D.A. Zarate, is a member of the Urethane Foam Contractors Association Roofing Systems Research Committee. The committee is developing performance criteria for spray-in-place polyurethane foam roofing systems.

Samples of polyurethane foam were taken from various cities in the United States and foreign nations.

"When applied properly on roofs and protected with suitable elastomeric coatings, PUF roofing systems have excellent stability and weathering properties as well as low maintenance requirements," according to the report's authors.

"The aging characteristics of the thermal conductivity of PUF in such a roofing system is important in order to establish this material as a viable alternative to conventional insulation materials," they added.

The Urethane Foam Contractors Association promotes activities relating to technical research of polyurethane foam.

## RIEI Appoints New Board

The Board of Regents of the Roofing Industry Educational Institute (RIEI) recently met in Toronto and elected new officers for the 1982-83 fiscal year.

The following appointments were made: Ted Titsworth, former Director of Marketing, Organic Materials Division of Koppers Co., Inc. was elected Chairman of the Board of Regents; John Bradford, president of Bradford Roofing & Insulation Co., Inc., and National Roofing Contractors Association President was elected Vice Chairman; Greg Faherty, Vice President of Owens Corning Fiberglas, was re-elected Treasurer.

Elected to the Board of Regents and serving four-year terms are: Robert "Country" Harrison, president of Greenville Roofing Co; Harry Harmon, Executive Vice Chancellor of the California State University and John William Ricketts, senior vice president of Tamko Asphalt Products, Inc.

Stanley Warshaw, president of Sarnafil (U.S.), Inc. was elected to the Board of Regents to fill the position vacated by Benjamin Ammons.

In related RIEI news, William C. Cullen, Chairman of the Board of Regents for the 1981-82 RIEI fiscal year presented a plaque to George Hasslein, Dean of the School of Architecture at Cal Polytech University in recognition of his contribution to the growth of RIEI for the first three years of its existence.

## Union Pens Pact

Union roofing employees are anticipating over \$100 million of work in 1983 as the result of signing the National Erectors Association national maintenance agreement.

The Roofers Union became the thirteenth union to sign and expects business volume to increase rapidly as use of the agreement is promoted in the industrial community, according to the *Construction Labor Report*.

There was not enough work for roofers to justify participation in the maintenance agreement program when it started in 1972.

Recently, however, Union President Roy E. Johnson and the National Maintenance Agreements Policy Committee Inc. (NMAPC) conducted a survey to see if membership would be viable for the 33,000 member union.

According to *Construction Labor Report*, "the survey showed that a major automobile producer, a steel company, a major utility network and a number of other industries were interested in having the roofers perform work for them under the maintenance agreement program."

NMAPC has provided more than 300 million manhours of work for union building tradesmen resulting in more than \$9 billion in wages and the placing of more than \$30 billion of construction.

## Home Buying Up 12 Percent

New single-family home sales reached a two-year high in November, according to the Commerce Department.

Sales climbed 12 percent to a seasonally adjusted annual rate of 569,000 from a revised 508,000-unit rate in October.

The November rate represented the fourth consecutive monthly increase.

Economists cite the late summer drop in home-mortgage rates for the surge.

Sales increased in every region with a particularly strong southern showing, running at an adjusted

320,000 unit annual rate.

Due to strong sales, the number of unsold houses at the end of November fell to an 11-year low of 243,000 — the lowest since 237,000 in June 1971.

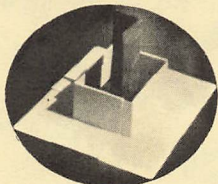
## Roof Deck Contractors Announce Convention

The National Roof Deck Contractors Association will hold its Third Annual Convention March 16-20 at The World of Palm-Aire in Pompano Beach, Fla.

NRDCA Members are subcontractors specializing in installing cementitious roof decks in all areas of the country.

For more information contact Natalie Holmes, CAE, NRDCA Executive Director, 221 N. LaSalle St., Suite 2026, Chicago, Ill. 60601.

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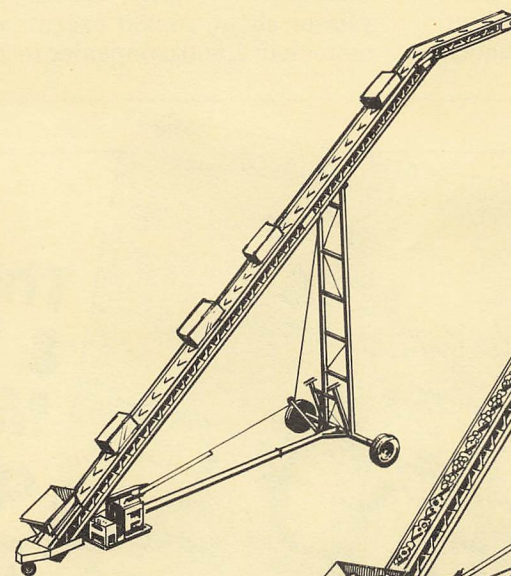
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#### Pan/Cone Roller Roofers Conveyor

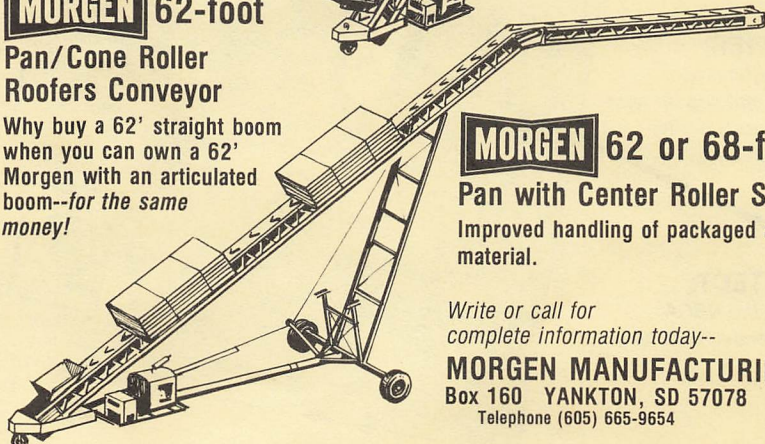
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# New Housing Looks Good Economist Says

The 1983 housing picture looks promising according to economist Henry Kaufman, managing director of Salomon Brothers, Inc.

In a speech addressing the annual convention of the United States League of Savings Associations, Kaufman said that new housing activity should benefit from several "basic demographic factors."

These factors include innovative financing techniques, governmental programs and the involvement of "a new national mortgage securities market that can marshal funds from many sources."

Kaufman cited, however, that recovery will be hampered by continued weak corporate performance, a

federal deficit totaling about \$160 billion, continuing high interest rates, a Federal Reserve Board monetary policy "shifting toward a direction not yet clearly defined" and by a huge government debt incurred by countries around the world.

## Contracting Execs Pay Boosted

Top contracting industry executives posted a 16 percent earnings increase in 1981, which is substantially greater than the 13 percent increase registered by other executives in major U.S. industries, according to *Dodge Construction News*.

The findings were reported in a study of executive pay conducted by Arthur Young for the Financial Executives Institute based on salary analysis of about 16,500 executives of more than 1,600 companies in 27 in-

dustry groups in seven national regions.

Top industry executives earned an average of \$123,751 in total compensation in 1981, ranking 16th among 27 major industries. Construction and contracting place fifth among the industry groups in terms of percentage gain in executive earnings from 1980.

Chief executive officers of construction and contracting firms at all levels of sales volume were paid an average of \$257,782.

According to the report, the highest paid top executives were those in the chemicals industry, earning an average total compensation of approximately \$190,319. They were followed by top executives in the petroleum industry who earned an average of \$172,550 and those in communications, with average earnings of \$166,874.

Ranked the lowest among the 27 industries polled were executives in real estate, \$96,437; commercial banking, \$101,012; and, life insurance, \$103,843.

**CONTRACTOR:**  
"Is the wood nailer, insulation and seal strip typically supplied by the curb manufacturer?"

**SPECIFIER:**  
"What is the proper fastener spacing for base flashing and counterflashing at curb?"

**ARCHITECT:**  
"What is the NRCA recommended curb height?"

## The NRCA Roofing & Waterproofing Manual answers questions.

Prepared by the National Roofing Contractors Association, **The NRCA Roofing & Waterproofing Manual** is a 450 page compilation of accepted industry standards and practices.

In a single volume are 8 complete sections on:

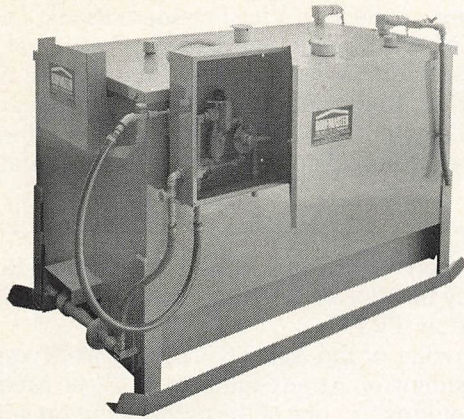
- Waterproofing
- Steep Roofing
- Built-up Roofing (with two chapters on single-ply)
- Handbook of Accepted Roofing Knowledge
- Construction Details
- Technical Bulletins
- Glossary
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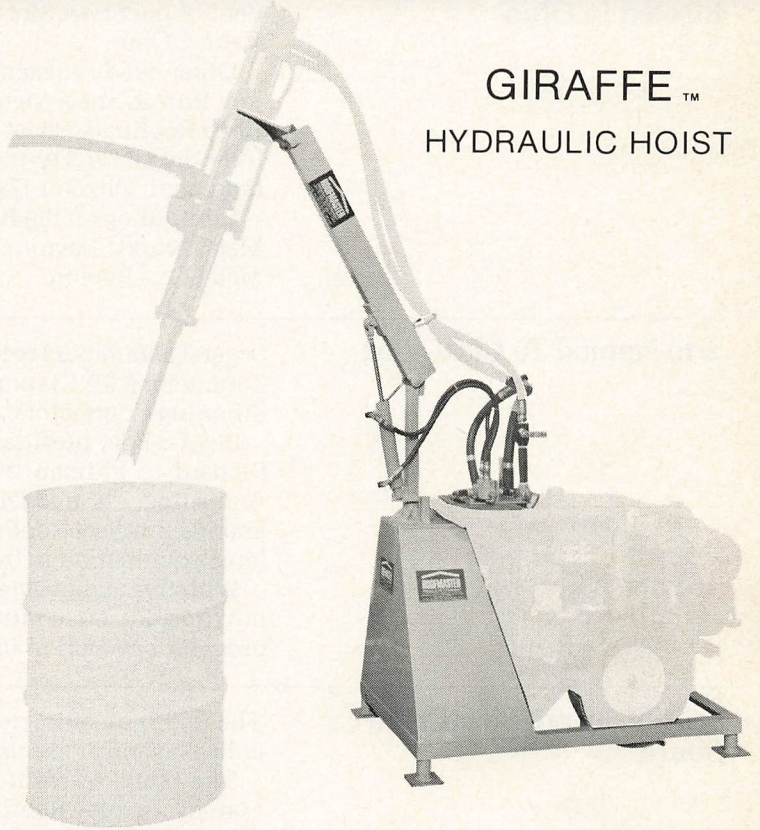
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# Affiliate News

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## **New Officers and Board Elected in Ohio**

Robert Seidan, Hughes-Bechtol, Inc., Dayton, Ohio was installed as President of the Sheet Metal and Roofing Contractors' Association of the Miami Valley, Ohio.

Other newly elected officers for 1983 are: First Vice President Larry Cochran, Rumac Sheet Metal Co. Dayton; Second Vice President Richard Center, Abco Roofing & Sheet Metal Co., Dayton; Treasurer Blaine Lancaster, Comfort Control Co. Dayton; Director Lou Taylor, Field and Associates, Springfield; and, Director Daniel Kerber, Kerber Sheet Metal Works, Troy.

Continuing on the Board of Directors will be Thomas Budde, Budde Sheet Metal Works, Dayton, and Robert Neumeister, Enterprise Roofing and Sheet Metal Co., Dayton.

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## **Trio Named To CPRC List**

Several contractors recently earned the title of Certified Professional Roofing Contractor (CPRC) sponsored by the Florida Roofing, Sheet Metal & Air Conditioning Contractors Association (FRSA).

Ray G. Boe, president and owner of the Ash-Tik Corp., Fort Myers, Fla; Richard L. Pittman, vice president of Arnett Roofing & Sheet Metal, St. Augustine, Fla. and James H. Jenkins, Jr., one of the owners and president of Jenkins Brothers Roofing in Tampa, Fla. each successfully completed a day-long examination in order to qualify for the prestigious title.

With this achievement Boe, Jenkins and Pittman join a select group of approximately 60 contractors who have qualified for the title since the program's inception in 1972.

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## **Seattle Group Elects New Board**

The Roofing Contractors Association of Seattle recently elected new officers at its November annual meeting.

They are: President Leigh Haight, Haight Roofing Co; Vice President Pete Stanley, Stanley Roofing, and Secretary/Treasurer Pad Finnigan of National Blower & Sheet Metal.

Board members include: Past-President Vince Pirak, Tahoma Roofing Co; Don Bosnick, Bosnick Roofing; Phil Johnson, Builders Custom Roofing and Monty Moore, Pacific Rainier Roofing.

Associate Representatives to the Board of Directors are: Chuck McMillan, Hugh McNiven Co. and Dale Ford, Consolidated Fiber Glass Products.

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## **Sinclair Elected President**

The Washington Area Roofing Contractors Association recently announced the election of new officers and directors for 1983.

The are: President Tom Sinclair, Bradco Supply Corp; Vice President Ron Estes, Rayco Roof Services; Secretary Fran Lawryk, Washington Roofing Products and Treasurer Tom Spires, Waggaman and Brawner Roofing.

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## **Hoffman Wins Bid For Second Term**

The Roofing Contractors Association of San Bernardino & Riverside Counties, Calif. recently announced its 1983 officers.

Re-elected for a second term are: President Debbi Huffman, Roy O. Huffman Roof Co., Riverside; Vice President Doug Spear, Morrison-Hope, Inc., San Bernardino and Secretary/Treasurer Warren Lyon, Bell Roof Co., San Bernardino.

Directors are Gordon Sutton, Aylor Roof Co., Ontario; O.H. Ingram, Jr., Asbestos Roof & Insulation, Riverside; Bill Lucas, Lucas Specialty Rock, Fontana; and, Kirk Ross, San Valle Tile Kilns, Los Angeles.

R.D. "Bob" Bostwick will continue to serve as Executive Secretary.

# What makes the NRCA-sponsored Business Insurance Program a smart buy?

## Features designed for the roofing industry.

Your NRCA-sponsored General Business Insurance Program offers a comprehensive and economical package approach to your needs as a roofing contractor. It offers you:

- **Group buying power**—The group buying power of your NRCA membership enables you to take advantage of competitive rates.
- **Comprehensive coverages**—Property, liability, automobile, and Workers' Compensation—virtually every coverage you're likely to need.
- **Stability**—This protection is backed by the CNA Insurance Companies, an industry leader that understands the roofing business.
- **Renewal guarantee**—Special alert list protection gives advance warning when a severe loss record endangers insurability. Members have one full year to bring loss experience up to par.
- **Local service**—Your NRCA program provides local claims and loss control services plus the assistance of your local professional agent.

- **Association endorsed**—The involvement of NRCA assures you a direct voice in the program.

Designed specifically for the roofing industry, the NRCA program is the only General Business Insurance your association sponsors.

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The NRCA-sponsored General Business Insurance Program is underwritten by Continental Casualty Company or Transportation Insurance Company, two of the CNA Insurance Companies.



# '83 Convention Exhibitors

continued from pages 38

**Classic Products, Inc.** (946).

**Clearfield Conveyors, Inc.** (225, 227, 229, 231) will feature its folding and straight conveyors. Clearfield's LN-77 all hydraulic conveyor has a folding boom and a hydraulic lift jack.

**Cleasby Mfg. Co., Inc.** (118) will show the SpeedKing LoLoader version of its standard asphalt heating equipment, the two-piece trash chute hopper, automated dump tray for four-wheel trailers and OSHA accepted hot pipe bracket.

**CNA Insurance** (529, 531) provides business insurance coverage for property, liability, workers' compensation and business auto along with additional coverage specifically designed for roofing contractors through NRCA. The program includes a safety dividend to earn back a portion of premium based on favorable loss experience.

**Columbia ABECE, Inc.** (830) will present the Skandia Line of Concrete Roof Tile Machinery and concrete roof tiles. A tile display and a movie showing the manufacturing process are located at its booth.

**Columbine International, Ltd.** (153, 155) will exhibit Zinser hot air welding equipment and accessories, featuring the Zinser K-75/K-76 Dragon automatic membrane welder and the K-5 hand-held unit.

**Concord Management Systems, Inc.** (758) will exhibit its comprehensive computerized management information system for roofing contractors. A computer will demonstrate effective job costing techniques, fast and accurate take-offs for estimators and an accounting system.

**Conklin Co., Inc.** (712, 714, 811, 813) will present the Rapid Roof, Polymate and Polyflex roofing systems. These elastomeric coatings are weather-resistant, durable, energy efficient, lightweight, flexible, fire-resistant and provide a seamless membrane over a variety of substrates.

**Consolidated Fiber Glass Products** (245, 247) will exhibit Conglas BUR for hot and cold application, Conglas Modified Bitumen products and Conglas Roof Insulation products — all designed for commercial and industrial application.

**Consolidated Protective Coatings** (1010).

**Construction Fasteners, Inc.** (264, 266, 363, 365) will highlight the Dekfast product group of insulation fastening systems. This Factory Mutual Approved system can be used for steel or structural concrete decking and consists of screws with hexagonal steel or reinforced plastic plates.

**Cooley Roofing Systems** (452, 454, 551, 553) will present its Cool Top 40, a white 40 mil Chlorinated Polyethylene polyester reinforced single-ply membrane system designed for fully exposed installations by mechanically fastening on flat, sloped or curved roofs.

**Copper Development Association** (1034, 1036).

**Charles A. Crosbie Laboratories, Inc.** (532) will exhibit the CC-1000 Series Hydrocarbon Dispersants, the CC-2000 Super Stripper and the CC-3000 Series Super-rustooft which deoxidizes steel, aluminum, chrome and brass.

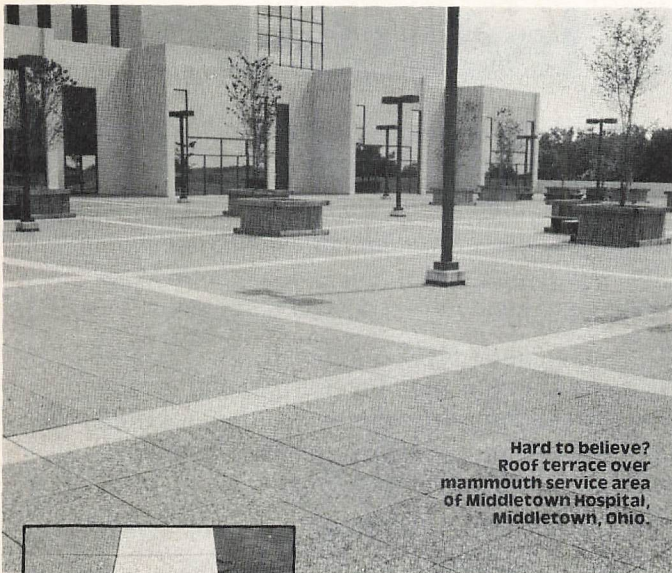
**CRF Industries, Inc.** (914) will present its metal, reinforced Wood "T" Beam, safety tested at over 600 lb. lifting capacity at all boom extension positions (4) and vertical adjustment positions (5). The beam meets all safety requirements for 150 lb. actual operating capacity.

**Daly Protective Coatings Co., Inc.** (925) will feature its EPM Roofing System, a cold applied modified bitumen process composed of polyester and a polymeric asphalt adhesive, in addition to Asbestos-Free Roof Coatings and Cements.

**Danosa Caribbean, Inc.** (743) will feature its modified bituminous membranes (SBS) with polyester or fiber glass armature.

**Decks International, Inc.** (632) will feature the Versarof® Reroofing System, Versadeck® Subpurlins, Versarof Re-roofing Insulation, Fasteners and Deck materials.

**Digital Systems** (745) specialize in the installation of turn-key computer systems for the construction industry. The system includes Job-Costing, Payroll, Accounts Payable, Financial Statements and other sub-systems.



Hard to believe?  
Roof terrace over  
mammoth service area  
of Middletown Hospital,  
Middletown, Ohio.



## ROOF TRAFFIC?

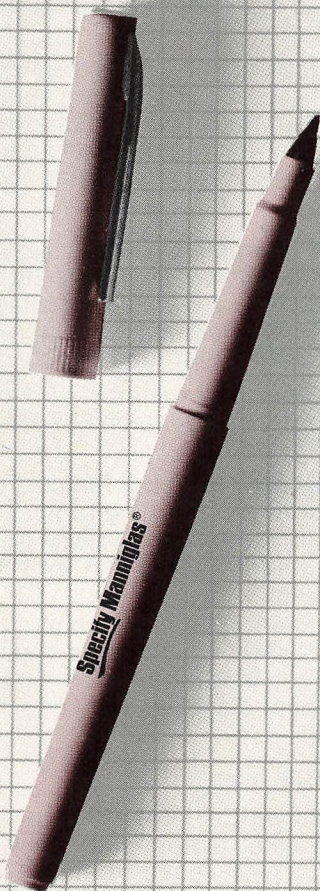
Not likely. Until now. System of elastic paver supports and paving slabs transforms dead roof area into beautiful roof terrace for pedestrian traffic. Weather surface is totally protected by natural stone aggregate concrete paving slabs. Open joints allow sub-surface drainage — roof terrace is always dry. Write for details.

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continued on page 46

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## '83 Convention Exhibitors

continued from page 44

**Dodge/SCAN** (1017, 1019) is the modern way to takeoff and estimate jobs without leaving the office. Dodge/SCAN delivers the complete bidding document on 35mm film which can be projected to full size and original scale on a specially designed worktable/viewer.

**Dow Chemical USA** (333, 335) will display Styrofoam\* RM brand insulation for use in new construction, re-roofing and retrofit applications. Styrofoam RM brand insulation is the key component of Dow's Insulated Roof Membrane Assembly system.

**Dunlop Construction Products, Inc.** (960, 962) will introduce the new DUNSEAL Roofing and Waterproofing Total Concept System. DUNSEAL EPDM, Hypalon and Neoprene membranes are each available with a complete range of compatible accessories.

**DuPont Co.** (815, 817) will present its REEMAY® spunbonded polyester, a superior reinforcing mat for commercial BUR systems.

**Duro Last Roofing, Inc.** (1008) will present its proprietary Trimeric Polymer Coated Polyester fabric, which is non-migrating, non-wicking resistant to Ultra-Violet rays and micro-organisms and impervious to most caustic chemicals and acids with great tear and puncture strength.

**DUR-O-SEAL Systems, Inc.** (917) will introduce its polyurethane single-ply which is made of 100 percent solid polyurethane and is marketed under the name of Dur-O-Ply I. The product is available in two thicknesses and each is available in reinforced or non-reinforced.

**Dynamit Nobel of America, Inc. and Trocal Roofing** — a division of the company (1054, 1056, 1058) will provide literature about Trocal's loosely-laid, single-ply roofing systems and offer a complimentary cup of coffee to convention attendees.

**Elastizell Corp. of America** (260) will exhibit the Elastizell Insulating Concrete Roof Deck System which provides positive drainage, a rigid, nailable roof deck and fire resistance at a competitive cost.

**Elco Industries** (1108)

**Eliminator Vac Systems** (117, 119, 121, 123) is introducing its improved 1983 product line, featuring its new low maintenance filter system. The Mark X Two-way Air Conveyor, which has the ability to both vacuum and blow gravel extreme distances, will be on display.

**Elk Corp.** (929, 931) will feature Elk Prestique II laminated fiber glass shingles and Prestique laminated fiber glass shingles, Elk's heavyweight, top-of-the-line product.

**Engineered Components Co.** (1107).

**Enterprise Companies** (856, 858) will exhibit its Memoric Seamless Roofing Systems, a family of elastomeric products which build durability and flexibility into the roof, while sealing and waterproofing without seams.

**Envirospec Inc.** (156) will present its PAVE-EL pedestal system, designed to elevate and uniformly space patio paver-stones on waterproofed deck areas and create a secure, functional walk surface.

**ES Products, Inc.** (261) will feature the RIV-NAIL® fastener, CAPPED ES/nail® for cement or wood fiber decks and NAIL-TITE® for poured gypsum decks.

**Evans Products Co.** (805, 807) will present its full line of fiber glass BUR products including Types II and V Base Sheets, perforated Base Sheet, Types I, III and IV Ply Sheets, Cap Sheet, Asphalt, a full line of Roof Coatings and Rigid Urethane Insulation including: Glass Faced Urethane, Composite Urethane with 3/4" perlite and foil-faced urethane.

**Evergreen Slate Co., Inc.** (432) will exhibit roof layouts of its Vermont roofing slate in all colors. Slater's tools will also be exhibited including rippers, hammers and the "ESCO" slate cutter.

**Fabco Fastening Systems** (564, 566, 663 & 665) will display its full line of INSUL-FIXX screws, plastic and steel plates, CON-FIXX thread-cutting screws for concrete, TOGL-FIXX bolts for Tectum deck, and a complete line of stand-up insulation fastening tools.

**Fibre Form, Inc.** (950).

**Firestone Industrial Products Co.** (140, 142, 239, 241) will exhibit its three systems of single ply EPDM Membrane Roofing. Along with adhered and ballasted systems, Firestone will feature Mechanically Anchored, its newest system in leak tight rubber technology.

**Flame Engineering, Inc.** (844) will present its complete line of Red Dragon torches and torch kits for use with single ply and BUR systems.

**Flexguard Marketing, Inc.** (1012) will feature Flexguard Roofing Systems for new or existing roofs. The base-coat is sprayed or rolled on the surface to form an elastomeric vapor barrier, and Rufon by Phillips 66 adds additional strength.

**Flex-Shield Corporation** (165) will exhibit its water-based elastomeric system which offers resistance to ponding water and sub-freezing temperatures as well as providing permanent elasticity and heat reflection.

**The Flood Co.** (751).

**Follansbee Steel Corp.** (460).

**Foremost Manufacturing Co.** (361) will display its pre-finished galvanized steel featuring the new coating system of Kynar 500 by Glidden in sheets and pre-formed systems. A new Kynar color, weathered copper, will be highlighted.

**Fortifiber Corp.** (711, 713) will exhibit its moisture vapor barriers for use in BUR and single-ply roofing systems, and its R-15 and R-30 ROOF UNDERLAYMENTS designed as alternates to Type 15 and Type 30 conventional roof felts.

**Futura Coatings, Inc.** (755, 757) will display high performance liquid-applied elastomeric coating systems designed for various types of roofing applications and introduce FUTURA-PLY, an alternative to single-ply roofing systems.

**GAF Corp.** (226, 228, 325, 327) will feature its Super System, a complete program of roll roofing, single-ply roofing, roof insulation products and accessories. An audio-visual presentation will demonstrate GAF products.

continued on page 48

**The star  
of the  
show.**



**GAF<sup>®</sup> Super  
System**

GAFTEMP<sup>®</sup> Roof Insulations, GAFGLAS<sup>®</sup> Built-up Roofing Products,  
GAFPLY EP<sup>™</sup> Single Ply Roofing Systems, GAF<sup>®</sup> Accessories

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# '83 Convention Exhibitors

continued from page 46

**Gardner Asphalt** (816).

**Garlock Equipment Co.** (240, 242, 244, 246, 248, 339, 341, 343, 345, 347) will feature its Hydraulic Roof Hoist and the new North Star Kettle line, in addition to its 62' conveyor, single-ply gravelers and little giant trailers.

**Gates Engineering Co.,** (934, 936, 1033, 1035) will highlight its seven single-ply sheet roofing application techniques using EPDM, neoprene and PIB. Information on liquid urethane/IRMA installation procedures and liquid neoprene/Hypalon roofing systems will be also available.

**Geissler U. Pehr** (959, 961).

**Genstar/Flintkote** (456) will feature its commercial roofing systems, residential asphalt roofing products and protective coatings, cements and emulsions. Flintlastic modified asphalt roofing system will also be exhibited.

**Georgia-Pacific Corp.** (731) will feature its line of residential roofing products.

**Giuffre Bros. Cranes, Inc.** (418) will provide information on its one-yard clam bucket, 1½-yard gravel hopper, a 4,000 pound pallet fork, 6,000 pound nylon lifting belts, a 3½-yard humpty-dumper and a 5/8-yard hippity-hopper.

**Global Coatings, Ltd.** (740, 742)

**B.F. Goodrich** (631, 633, 635) will feature its line of roofing accessories for single-ply and built-up applications including drains, vents, flashing, waterproofing products, solar-powered products and Lexsucu Insulation Clips and BFG Screw Fasteners.

**Goodyear Tire & Rubber Co.** (802, 804, 806, 901, 903, 905)

**Goss, Inc.** (918) will display its Ready Flame Torch which is used for bonding the new single-ply roofing materials. The torch is available in complete kits with extra components.

**W.R. Grace & Co.** (126, 128, 130) will feature Grace Roofing Membrane™, Zonolite® Roof Systems, Ice & Water Shield, Bituthene® Waterproofing and Serviced Durajoint® Waterstops and Joint Fillers.

**Graco, Inc.** (107, 109, 111).

**Grefco, Inc.** (426, 428, 525) will exhibit its full line of perlite and perlite/urethane roof insulations for use with BUR and one-ply system including Metalastic expansion joint cover, the Perma-fastener system of insulation attachment and the new EPDM membrane, Permalite® Sealskin® One-ply system.

continued on page 50

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## WE PUT PAVER STONES ON A PEDESTAL

*For perfect drainage in any weather*

**NEW!** A far better way to lay paver stones over water-proofed plazas, podiums, arenas and other deck areas. Pave-El® paver pedestals.

*With these definite advantages:*

- Positive drainage year in and year out
- Longer membrane life and maintains insulation thermal efficiency
- Compensation for unevenness of substrate or pavers
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*Write for detailed specification brochure.*

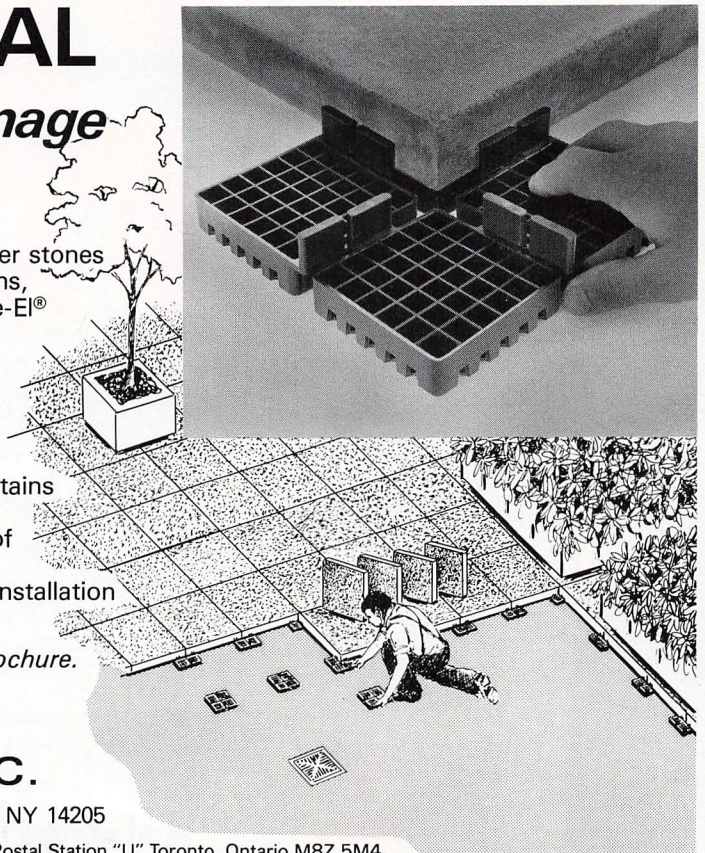
*Representative inquiries invited*

### ENVIROSPEC INC.

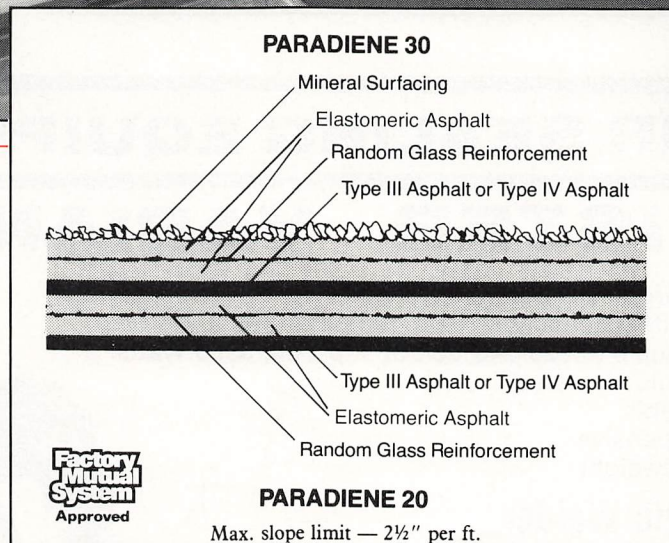
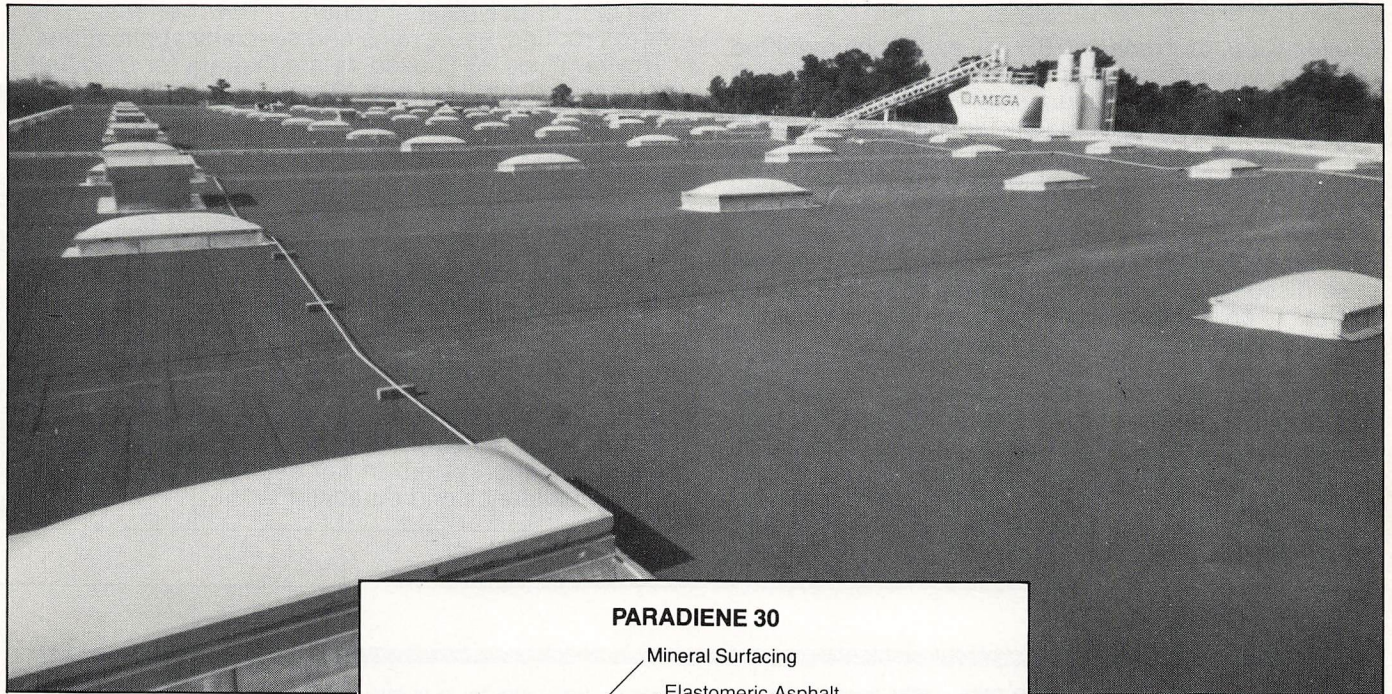
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But that's only part of Paradiene 20/30's flexibility.

The other part is its glass-reinforced elastomeric asphalt base. Allowing 100% elongation with full recovery, Paradiene 20/30 expands and contracts with the building.

Not only that, it retains elasticity through the most severe ultra-violet sun rays, thermal shocks, random ponding water and low temperature extremes. Fourteen years of service and millions of squares in service

bear witness to that.

Paradiene 20/30 is also relatively lightweight and easy to install. It can be used over most decks and roof insulations on all slopes up to 2½ inches per foot. Because of its granular surface, there's no need to apply gravel. And it comes in a choice of colors.

Fully guaranteed against leaks for 10 years, Paradiene 20/30 is the quality roofing system to think of first, when you want it to last. Trouble-free, so they'll forget it's there.

But they won't forget you're there.



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# '83 Convention Exhibitors

continued from page 48

**GTR Building Products Co.** (230, 232, 234, 236).

**Guaina Corp. of America** (707) will exhibit its modified bitumen with polyester or fiber glass scrim, smooth mineral surface or aluminum clad; its Polypren one-ply ECB Roof Fabric, a true one-ply film laid in hot asphalt with 600% expansion and contraction and its Italpro-fili line of Dutral (Butyl rubber) scuppers, drains and vents.

**Gulf States Asphalt Co., Inc.** (732) will have representatives discussing its hot mopped roofing asphalt and full-line of cold applied coatings for new roof construction and maintenance of existing roofs.

**Gusmer Corp.** (920) will exhibit the Models H-II and all new FF-III "Little Big Shot" Proportioning Units and complete line of spray and pour guns for dispensing urethane foam insulation. Continuous movies will be shown on urethane spray applications, chemical component characteristics and training films on GUSMER® Equipment.

**W.P. Hickman Co.** (602, 604) will present the HICKMAN NAILERLESS ROOF System which can be used with both built-up roofing or with single-ply roofing membrane.

**Hillsdale Industries, Inc.** (708) will present its PAM Skylights and Roof Accessories. Among the items to be shown will be a sample of the PAM 930 System, a preglazed panel system known for its versatility and ease of installation.

**Hoechst Fibers Industries** (832) will present its two basic types of polyester spunbond, nonwoven materials for roll roofing, geotextiles and specialty applications. "Trevira" Type 33 is used as a substrate for modified bitumen roll roofing, and "Trevira" Type II products can be used for other roofing applications such as slip sheets, rock shields and cold-applied roofing systems.

**Homasote Co.** (940, 942) will present its line of urethane and isocyanurate roof insulation boards, introducing its Ultra/C and Ultra/C-1 (FM-1 approved) product line for use with BUR and most single-ply systems and the Thermasote® Nail Base Roof Insulation.

**Howmet Aluminum Corp.** (725, 727).

**Hyload, Inc.** (1018) will present its Hyload™ 150 E pitch elastomeric membrane which is laid as a two-layer, built-up roofing system in hot asphalt with excellent fatigue resistance and durability.

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## HOT AIR SEALING EQUIPMENT

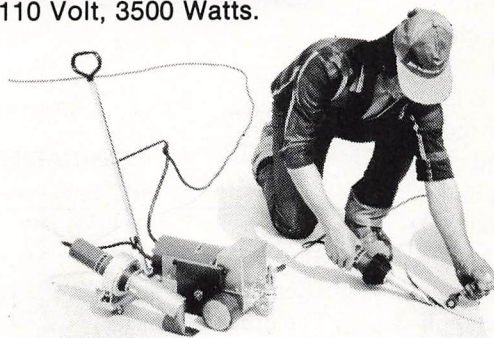
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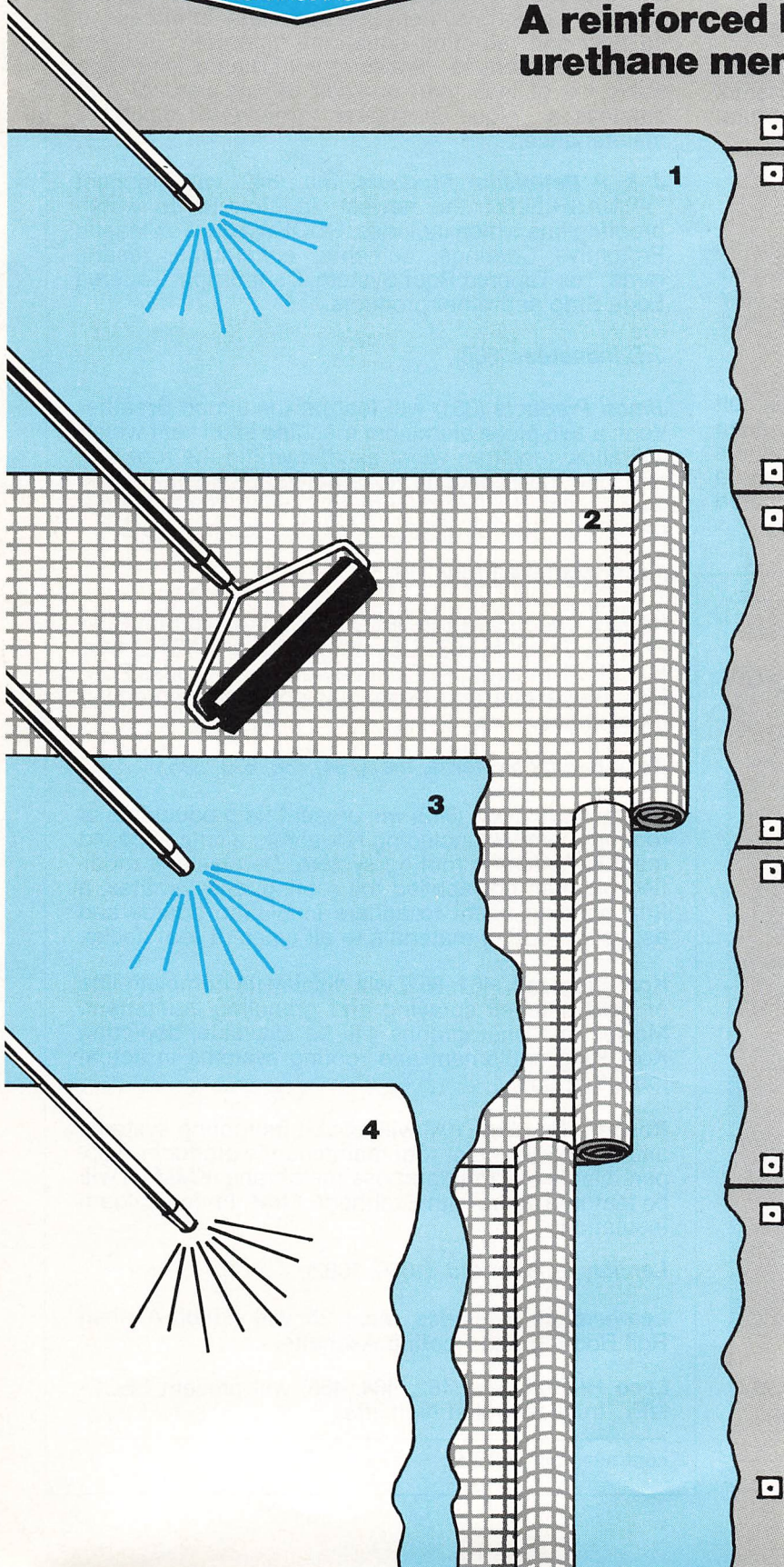
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**A reinforced liquid applied urethane membrane roofing system.**



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Applied by either roller or spray over most roof surfaces or insulation board stock.

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A special woven fabric is embedded into the wet base coat adding strength and dimension to the membrane.

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# '83 Convention Exhibitors

continued from page 50

**IMETCO** (429) will feature its complete line of fascia and roofing panels. The pre-coated galvanized steel and its high strength duralum pre-coated architectural metal and snap-tite reglets will be shown as well.

**Index Roofing Corp.** (834, 836).

**Instant Asphalt** (706) will present its rugged plastic and rubberized elastomerics Metacrylics™ system, including the LEVELIZER which is an acrylic co-polymer, plastic fillers, trace elements water-based product.

**International Building Products, Inc.** (458) will exhibit three major roof shingle lines, Classic Slate, American Landmark and a new shake shingle. These products combine natural beauty, long lasting durability and a U.L. Class "A" rating with a strong thirty year limited warranty.

**International Roofing Systems, Inc.** (144, 146, 148) will present a loose laid/ballasted, mechanically-fastened and fully-adhered EPDM; a mechanically-fastened CSPE; fully-adhered CSPE, laminated to a mineral backing and Neoprene Sheet with Hypalon coating, fully-adhered, mechanically-fastened systems.

**International Tile & Supply Corp.** (1001, 1003)

**IPW Interplastic** (728, 730) will exhibit Interroof™ a PVC single-ply roofing system used primarily in unballasted new and reroofing situations. Interroof™ is lightweight, resistant to ultraviolet light, has a shrinkage tolerance of less than one-half of one percent and employs a unique plasticizer formula for flexibility maintenance.

**J & P Petroleum Products, Inc.** (842) will highlight "AQUASHIELD," the newest addition to its waterproofing line which includes, ROOFWALK, Tex-Mastic Protective Coatings, cements, aluminums, resaturants, Tex-Tapered Roof System, Cant Strip & Tapered Edge Strip and other products.

**J.T. Industries** (808).

**Jimco Products** (831) will feature the Jimco Breather Vent, a two-piece aluminum machine spun vent which will allow moisture vapor escape within the roof system, and the Ballard J-L-10, a patented one piece, one way insulated all aluminum spun vent which will not permit the flow of moisture into the roofing system.

**Kabar Manufacturing** (1025).

**Karnak Chemical Corp.** (651, 653) will exhibit its Cold Process POLY-MASTIC Systems. POLY-MASTIC Systems P-21 through P-24 will be shown as well as Poly-Mat, Poly-P-Mat and Resat-Mat polyester reinforcing membranes.

**Kelly Energy Systems, Inc.** (734, 736, 833, 835.)

**Kimmenade Corp.** (912) will present its product line of roofing materials including Novapren, a liquid-applied modified bitumen roofing system; Duralasta, a modified bitumen hot applied roll roofing, and Vedatex, a firm bonding agent to adhere insulation boards and asphaltic roofing materials to all types of roof decks.

**Kold King, Inc.** (461, 362) will display its complete line of cold process spraying and granuling equipment. Movies and photographs will be available, depicting Kold King equipment and roofing systems in actual job situations.

**Koppers Co., Inc.** (104) will exhibit its roofing systems and complete line of roof maintenance products. Koppers single-ply, multipurpose membrane (KMM®) will be featured along with Exeltherm Xtra® Phenolic foam insulation.

**Langley London Ltd.** (1060, 1062).

**Leatherback Industries, Inc.** (735) will exhibit Asphalt Roll Roofing and Roofing Asphalts.

**Leco Hi-Lifts, Inc.** (462, 464, 466) will present LECO-LIFT, truck-mounted high-lifts.

continued on page 54

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## '83 Convention Exhibitors

continued from page 52

**Leigh Products, Inc.** (134) will display a complete line of commercial residential roof ventilation systems, including ridge vents, static roof vents, gable vents, power and turbine vents — available to correspond with most popular shingle colors.

**Lincoln St. Louis Div. of McNeil Corp.** (848) will exhibit Airless Equipment for cold-applied roofing compounds and dispensing equipment for lap adhesives and sealants.

**Liquid Asphalt Systems, Inc./Taurus** (451, 453, 455, 457, 459, 352, 354, 356, 358 & 360) will display Taurus Asphalt Tanks and other roofing equipment.

**Little Giant Industries** (1039) will exhibit its 22' LITTLE GIANT ladder which meets OSHA standards with the highest rating, type 1A with 300 pound capacity.

**London Chemical Co.** (750) will show its Elastomeric roof coatings.

**Ludowici-Celadon Co.** (259) will exhibit its high quality clay roofing tiles in both glazed and unglazed colors for use in all climate areas of the United States.

**Lutrasil** (744) will exhibit *Lutradur*, a thick diameter spunbonded polyester for high performance BUR membrane and cold process. Several of its features are: compact structure — less chance for moisture entrapment; high initial modulus; equal strength — all directions; high heat resistance to 450°F; good flex life; great puncture resistance and tear strength and asphalt on the outside for waterproofing.

**Mage, Inc.** (958) will exhibit Kwik-Deck, for fastening of rigid insulation to metal roof deck, and the V-150 fastening of rigid insulation to metal roof deck, and the V-150 fastening tool.

**Manchester Ladder Co. Inc.** (662) will present its roofers laminated wood side rail extension with heavy duty hand-shaved oak rungs and heavy duty locks and hardware, and introduce its new line of fiber glass extensions and step ladders.

**Manville Corp.** (510) will feature its three single-ply systems, along with F.A.S.T. computer services. New products will include Fes-Core and Fesco-Foam SP, two new roof insulations, and Tuf-Ply, a new modified asphalt roofing system. Manville will also exhibit its complete line of fiber glass shingles, which are rated Class A for fire resistance by UL.

continued on page 56



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Contact UIP . . . the only American manufacturer to offer machinery for the production of Modified Bitumen Single Ply Roofing.

**UIP can build an entire single ply roofing plant . . . to put you into business.**

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**Thermawall:** Foil covered foam is permanently bonded to gypsum board, combining insulation and finish drywall in one product. Perfect for interior walls and ceilings.

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**Ply-I:** The newest achievement in single ply roof insulation. Two sides of tough, fiberglass-reinforced aluminum make this the thinnest, lightest way to get a Class I rating.

**Thermarroof Plus Composite:** A single ply insulation board featuring a perlite base layer bonded to polyisocyanurate and a top skin of aluminum.



**Thermarroof Standard:** For BUR applications, this product features top and bottom layers of bonded fiberglass roofing felts.

**Max-I:** Our newest product for Class I BUR applications. Its tough, asphalt-coated fiberglass mat skins make it the lightest, most efficient product of its kind on the market.

**Thermarroof Plus:** Also for single ply roofing, this incorporates a fiberglass-reinforced top foil and a durable aluminum lower foil.

**Available Base:** Designed specifically for use where insulation and shingle underlayment are required, this board features a bottom skin of roofing felt bonded to foam and topped with a wooden available base material.

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# '83 Convention Exhibitors

continued from page 54

**Marathon Roofing Products, Inc.** (534, 536) will feature Standard and XL plastic, copper and aluminum insulation breather, copper roof drains, vents and vent collars.

**Merchant & Evans Industries, Inc.** (652, 654).

**Metal-ERA, Inc.** (1022).

**Metal Sales Mfg. Corp.** (1046, 1048).

**Miro Industries Inc.** (1102, 1103).

**MM Systems Corp.** (425, 427) will feature its new Snap-Lok Fascia System for single-ply roofing, and its complete line of fascia systems, drip-proof fascia and Snap-lok Coping. The Batten-Tite Roofing System will be shown as well.

**Molenco, the Building Components Div. of Moncrief-Lenoir Mfg. Co.** (906, 908) will present Kynar 500 flat sheets and its line of metal roofing and siding products.

**Monier Co.** (157) will feature its fireproof, Class A rated roof tile available in a wide range of colors and covered by a 50-year warranty.

**Moppo Products** (847).

**Morgen Mfg. Co.** (326, 328, 330, 332, 334, 336) will display a 68' Roofers Conveyor designed to handle roofing materials and gravel. The Roofers Conveyor has a belt with 1½" high V-shaped cleats and an 18' articulated section that allows the operator to reach setback roofs or work in tight quarters.

**Multi-Chemical Products, Inc.** (1004) will feature its Multi-I-Therm and Multi-I-Thane roofing systems which provide waterproofing and weatherproofing protection for both low and high density polyurethane foams.

**Multilite Corp.** (756, 855) exclusive representative of Cindu products, will exhibit its corrugated roofing panels consisting of a steel core, asphalt and embossed aluminum, in addition to its single-ply roofing membrane, plastic cement, asphalt and other roofing materials.

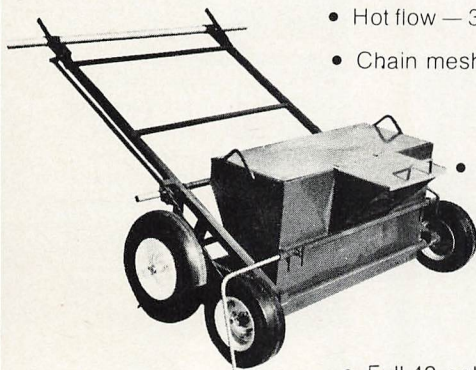
**National Nail Corp.** (430) will exhibit its fasteners for built-up roofing on wood or concrete decks, including the Round-Top cap nail line. A new Plasti-cap fastener will be introduced as an inexpensive alternative to the Round-top nail designed for residential construction.

continued on page 58

# Julien P. Benjamin

## EQUIPMENT COMPANY

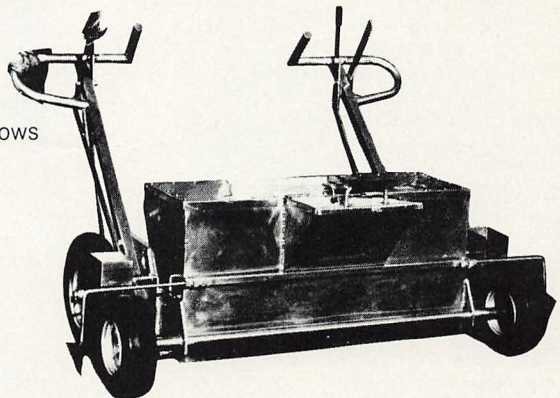
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Put down a RIMSPRAY™ roof right, and you've got a roof that will last.

It's proven.

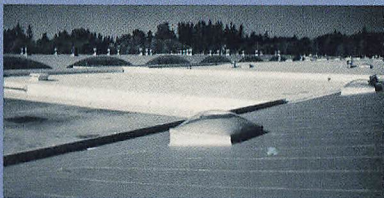
RIMSPRAY™ is successfully protecting these roofs and other polyurethane foam roofs all over the Western Hemisphere!

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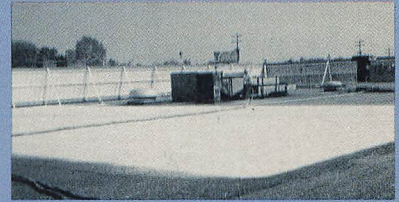
Grocery Warehouse - Portland, Oregon



Industrial Plant - Portland, Oregon



Telephone Company - Upland, California



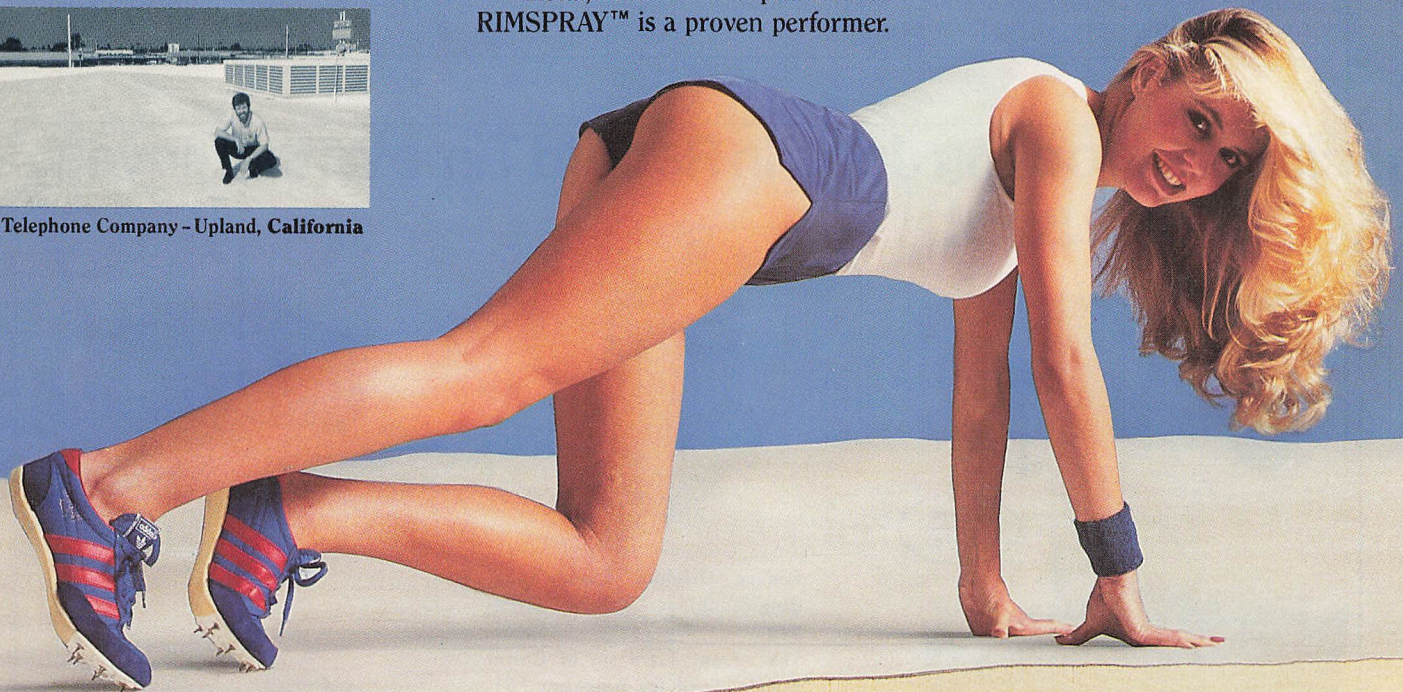
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# '83 Convention Exhibitors

continued from page 56

**The National Tile Roofing Mfrs. Association, Inc.** (113, 115) will have a booth providing information on the organization and samples of different styles of clay and concrete roof tiles with installation photos.

**Naturalite, Inc.** (136) will present its line of energy conserving skylights including roof scuttles as well as mechanical and drop-out type fire vents. Samples of various skylight corner sections and descriptive literature will be available.

**Nieman Equipment Co., Inc.** (359) will exhibit its Power Roof Remover. This machine will remove roofing and insulation down to the deck even if the insulation is solid mopped to a concrete deck.

**Nord Bitumi U.S., Inc.** (913, 915) will exhibit its Poly 4 modified bituminous membranes produced at its new U.S. manufacturing plant. Poly 4 is produced in a standard thickness of 4mm. and consists of bitumen modified with thermoplastic resins of the polypropylene type, elastomers and mineral stabilizers with a tough inner core of nonwoven polyester mesh.

**NRG Barriers, Inc.** (655, 657) will present its specialty Tapered and Nailable Urethane Roof Insulation including a full-line of Composite and Polyisocyanurate Foam Insulations for use under built-up and single-ply roofing membranes.

**Nu-Chem, a Div. of Davco Chemicals & Plastics,** (916) will feature its Flexotherm Tech™ Aliphatic Urethane Elastomeric Coating, Flexotherm Pro™ Wall Flex™ Elastomeric Wall Coatings and Flexo VB 200™ advanced technology waterproofing.

**Olympic Fasteners, Corp.** (948) will feature its all-purpose roofing screws for both steel and concrete which are more corrosion-resistant than zinc and are available in sizes up to 12 inches in length.

**Onduline U.S.A.** (850) will exhibit its asphalt-impregnated, corrugated roofing which won't rust or corrode and is available in a variety of colors with choice of two finishes.

**OTTO® Fabric, Inc.** (606, 608, 610, 612, 614, 616) will present the OTTO® STR® Silicone Roof System — an adhered Single-Ply® system not requiring ballast — and Silicone Fiber glass fabrics used in tension and air-supported structures, pond liners, roofing membranes and special industrial applications.

**Owens-Corning Fiberglas Corp.** (110) will display its complete line of commercial roofing products.

**P.A.L. Development Corp.** (533, 535).

continued on page 60

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Heavy Duty Kettles  
100-140-200 Gallons



RK-265 & 310 Gallon  
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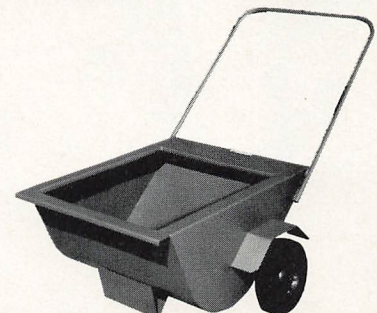
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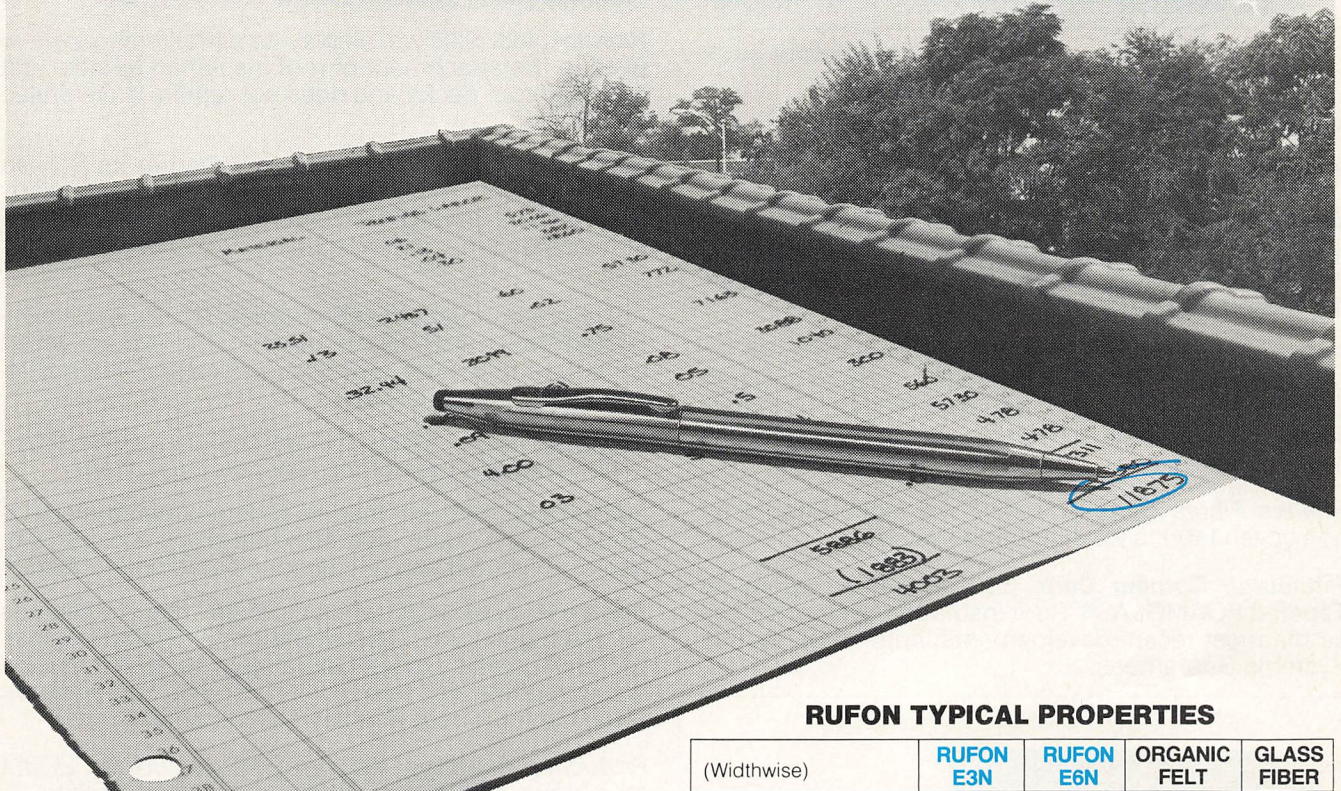
## ROOFING EQUIPMENT CO., INC.

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## RUFON TYPICAL PROPERTIES

(Widthwise)	RUFON E3N	RUFON E6N	ORGANIC FELT	GLASS FIBER
Weight (yd <sup>2</sup> )	3.0	6.0	21.2	16.3
Ultimate Strength (lb.)	70	135	64	65
Tear Strength (lb.)	35	55	.05	.02
Elongation (%)	60	55	.05	.01
Mullen Burst (psi)	140	250	30	19
Puncture (lb.)	35	70	20	10

Selecting a roofing fabric is a matter of product performance as well as economics. And that's why so many of today's contractors are taking a close look at Rufon, the cost-effective reinforcing mat that easily outperforms all alternatives: Organics. Fiberglass. Even other polyesters.

### UNPARALLELED PERFORMANCE.

For single or multi-ply cold roofing, Rufon has been engineered by Phillips Fibers Corporation for extraordinary performance. Just check the figures on strength, elongation, mullen burst and puncture resistance. This needle-bonded, thermal set synthetic tops them all — and won't separate, fuzz up or delaminate. Rufon will also form and fit easily, stays flexible in low temperatures and won't swell, rot or mildew.

### EXCEPTIONAL ECONOMY.

Rufon offers attractive cost benefits, because cold coating application has never been this easy. Combined

with a suitable mastic, lightweight, easy-to-handle Rufon goes down faster, with less manpower and delivers exceptional, long term performance. When you consider total applied cost, Rufon's advantages can add up to important savings on your bottom line.

### MORE INFORMATION.

Rufon is available in weights of 3.0 oz. (E3N) and 6.0 oz. (E6N) per square yard, pre-marked with overlap guides in 36" x 375' standard put up rolls. With so many performance benefits, cost-effective Rufon is today's optimal solution to roofing failure. Learn more about Rufon: Contact Phillips Fibers Corporation, or your roofing products distributor listed below.

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Dover, OH 44622  
(216) 343-4441

**WASHINGTON**  
American Tar Co.  
1700 N. Northlake Way  
Seattle, WA 98103  
(206) 632-0828



# '83 Convention Exhibitors

continued from page 58

**Parker Sweeper Co.** (741).

**Perma Glass Mesh Corp.** (747).

**Perma "R" Products, Inc.** (812, 814) will present its roof insulation — from expanded polystyrene and urethane materials — and composite boards of fiberboard, perlite, waferboard and gypsum board.

**Peterson Aluminum Corp.** (329, 331) will display its complete line of architectural aluminum and galvanized steel and its recently introduced PAC-CLAD Panels which are a line of roll formed fascia, mansard and roofing panels.

**Phillips Fibers Corp.** (933, 935) will exhibit its Rufon nonwoven fabrics for all roofing systems.

**Pittsburgh Corning Corp.** (552, 554) will feature its Tapered FOAMGLAS® Roof Insulation System as well as the most recent developments in its Total Roofing Systems Guarantees.

**Plymouth Rubber Co., Inc.** (555, 557) will present its mechanically fastened batten system for its EPDM and Neoprene™ Roofing Membrane Systems — ideal for use on roofs that cannot be ballasted. The Plyroof Batten Systems are economical and can be used over existing roofs.

**PMS/Sucoflex** (1011, 1013).

**Pneutek, Inc.** (952) will display its air-fastening system used in the attachment of roof insulation to steel and concrete roof decks and does not require a pre-drilled hole.

**Polymer Chemical Corp.** (746) will feature its Polyiso Polyurethane Foams which are versatile cellular plastics with unsurpassed insulating properties available in densities ranging from one-half to 30 lbs. per cubic foot.

**Polymer Development Laboratories, Inc.** (843) will exhibit its RIMSPRAY™ Monolithic Roofing System which covers a roof with a seamless membrane without requiring ballast or adhesives.

**Polymer Plastics Corp.** (258) will feature its elastomeric polyurethane membrane roof coating system.

**Polysar Ltd.** (166) will feature its line of elastomers including butyl, halobutyl, ethylene-propylene (EPDM), nitrile, polybutadiene and styrene-butadiene rubbers.

**Portals Plus, Inc.** (723) will feature its lines of flashings for sealing around pipes where they penetrate single-ply, built-up and exposed metal deck roofs. All models accommodate 3/8" through 6-inch pipes and units are available for retrofit and new installations.

**Protective Coatings, Inc.** (729) will feature its EPDM membrane systems available in black and white including fire retardant black and white. Sheet sizes are available up to 40 foot wide by 200 foot long.

**Publishers for Conventions, Inc.** (243) will be distributing free copies of the National Conventioneer, a reference book of product literature relevant to roofing contractors.

**R and D Industries, Inc.** (826) will exhibit its Unirail attachment system for mechanically fastening single-ply membrane roofing products and insulation to substrates or roof decks.

**Reach Plastics & Chemicals, Inc.** (129, 131) will display its Gripcon Concrete Fastening System for mechanical roof insulation fastening and Rotary Hammer Drill Bits for drilling into extra hard concrete.

**Reeves Roofing Equipment Co., Inc.** (518) will display its Super 1500 Gallon JUMBO LP Pump Kettle, No. 180 Super-Tex and No. 140 Big-Tex Rotary Spudding Machines, No. 195 Self Propelled Power Broom, the Wind Row with Gravel Hopper and the Power Graveler.

**R & G Sloane Mfg. Co., Inc.** (852) will display its PVC Plastic Roof Drains with removable dome strainer, combined flashing collar and gravel stop, high capacity pump and underdeck clamp secured in place with four rust-resistant bolts.

**Reimann & Georger, Inc.** (526, 528, 530, 625, 627, 629) will display its complete line of hoisting equipment with accessories.

continued on page 64



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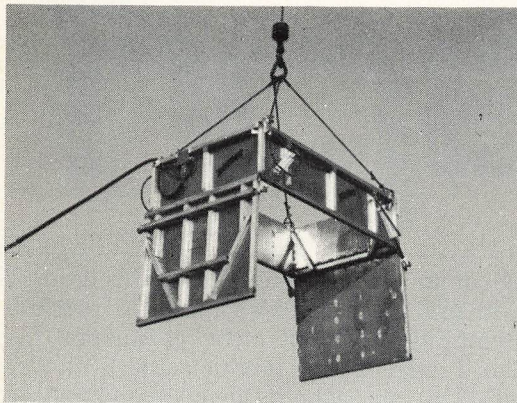
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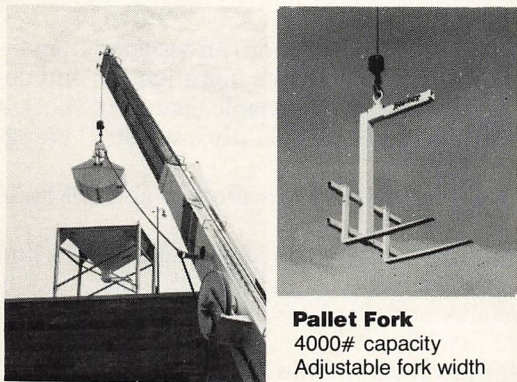
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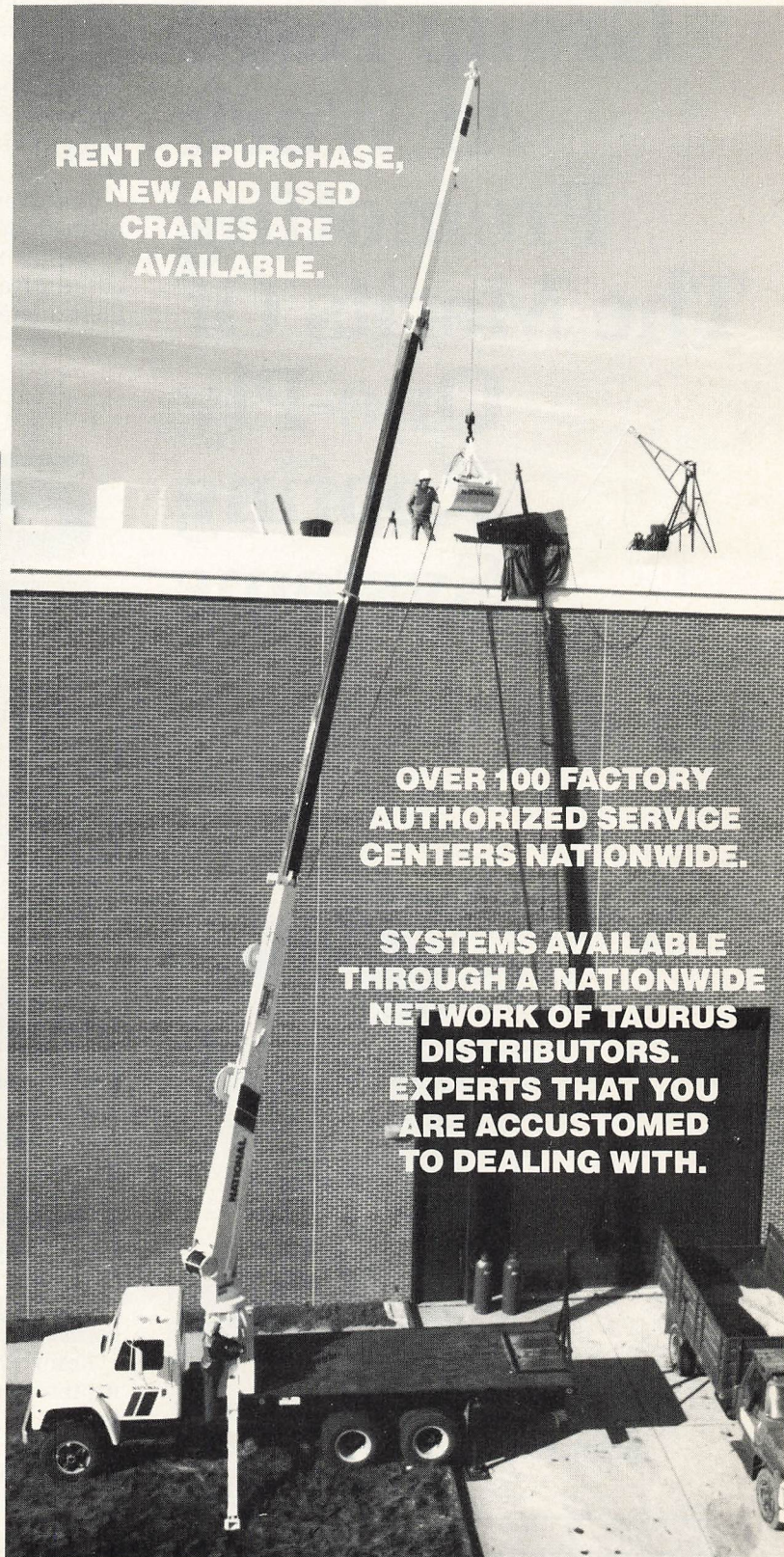
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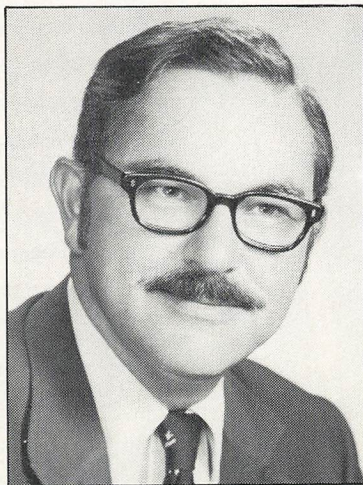
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# Single Ply Group Hard At Work Promoting The Merits Of One-Ply Roofing Systems



**“We have already achieved more than we originally thought.”**  
**Carl Wangman**

All set to celebrate its first anniversary in March, the Single Ply Roofing Institute (SPRI) has spent the past twelve months laying the foundation for a greater cohesiveness among manufacturers of single-ply roofing systems, which are rapidly gaining momentum in the roofing industry.

“We’re an outreach organization, intent on increasing recognition of singly ply as being a viable solution to many roofing needs,” said Ruth Warshaw, a SPRI director.

Carl Wangman, SPRI executive vice president, explained that a group of manufacturers and marketers of single-ply roofing materials met about a year ago to discuss the feasibility of forming an association to represent their interest.



A steering committee was formed from this group of participants including: Frank Poley, Carlisle Tire & Rubber Co; G. Brent Elder, Dynamit Nobel of America, Inc; Jerry Pearman, Tamko Asphalt Products, Inc; Ruth Warshaw, Sarnafil (US) Inc; Richard Ducey, Manville Bldg. Materials Corp; Carl Wangman, The Breeden Co; and, Dave Bailey, formerly with Koppers Co., Inc.

During the 1982 95th Annual National Roofing Contractors Association Convention and Exhibit a meeting was held.

“At that time, my firm (Breeden) an association management company, completed its investigation and determined that there was a reasonable chance of success for an organization serving single-ply interests,” Wangman said.

As a result, a set of by-laws was adopted and SPRI was launched.

The Steering Committee members became SPRI’s first directors with the addition of Joseph McCusker, Cooley Roofing Systems and Paul Mitchell, Tremco Roofing Division.

John A. Jeffries, Keck, Mahin & Cate was named legal counsel.

Frank Poley was named president with Elder tapped for the vice presidency and Pearman, secretary-treasurer.

Explicit in the by-laws is the rule that all elected directors must be selected to equally represent the three principal single-ply product categories: Rubber, Ther-

moplastic and Modified Bitumen.

SPRI voting members include the manufacturers and marketers of single-ply products. Associate members include suppliers, consultants, architects and distributors.

"Many associations have been developed to serve the interests of the contractors," Warsaw said. "But there are many issues and problems shared by manufacturers that are best served by a manufacturers' association."

The Breeden Co. provides executive management services while policy decisions are made by the SPRI Board of Directors.

The Board of Directors designated certain topics for committee appointments. SPRI committees include: Technical; Health, Safety & Environmental; Membership; Industry Liaison; Nominating; Statistics; Product Specification; Program and Public Relations.

One of the first committees established was the Technical Committee, headed by McCusker.

"The initial thrust (of the Technical Committee) was to develop performance specifications, position papers and followed by product specifications," Wangman said.

Top priority on the Technical Committee agenda is the formulation of an elastomer/plastomer single-ply roofing systems guide.

"The guide covers materials, definitions, minimum thicknesses for membranes of various types, flashing, preparation of surfaces, methods of attachment, field lap splicing and sealing, penetrations and precautions," Wangman said.

Warsaw clarified SPRI's position .

"SPRI is not a standards setting body, she said. "But we will issue guidelines."

Poley also avoids the term "standards," preferring "recommended specifications."

In December 1982, SPRI's Industry Liaison Committee met with several NRCA officers and directors.

"SPRI recognizes the importance of its relationships with all elements of the roofing industry," Wangman said. SPRI will be working with NRCA in developing the single ply supplement to the *NRCA Roofing and Waterproofing Manual*.

Poley also emphasized the value of liaison work.

"Many contractors are totally disassociated with manufacturers and suppliers," Wangman said. "SPRI wants to bring closer ties between NRCA and manufacturers, because we are all in pursuit of the same goal."

Poley also said he does not want the importance of the Safety, Health & Environmental Committee underestimated.

"SPRI is concerned about the toxicity problems facing roofers," Poley said. "We'd like to see that roofers do have protection and see that there is caution when using, storing and disposing toxic materials."

Directors Warsaw and Mitchell, who compose the Public Relations Committee, have completed a slide

film presentation, "Ready for Change." Many questions concerning single ply are answered in the program, covering its history, the manufacturing process, material components and application systems.

The Public Relations Committee's next projects include the development of educational programs and a speaker's bureau.

The Statistics Committee is looking into developing statistical data concerning single ply, such as single ply's share in the roofing materials market, according to Warsaw.

"We are concerned about the size of the market and its growth characteristics," Warsaw said.

The First Annual Meeting was held in Miami, Fla. January 27-30.

Meeting at the Doral Country Club, SPRI reviewed its progress, discussed future plans and listened to speakers from Underwriters Laboratories, Factory Mutual,



SPRI Directors and Public Relations Committee members Paul Mitchell (Tremco Roofing Div.) and Ruth Warsaw (Sarnafil U.S. Inc.) select slides for the slide-film presentation, "Ready for Change."

the National Bureau of Standards and the National Research Council of Canada.

Mitchell feels that SPRI "has made a tremendous amount of progress" in one year.

Warsaw agrees. "The testimony to that progress is that we are continuing to grow," she said. "We're attracting the interest from the roofing industry that we've been hoping for."

President Poley, a veteran of numerous associations, is amazed with SPRI's success.

"Never before have I ever seen a group of competitors work as closely and as effectively as I have with this group," Poley said. "We have already achieved more than we originally thought."

SPRI is well on its way to becoming a significant force in promoting single-ply systems in the roofing industry.





## '83 Convention Exhibitors

continued from page 60

**Republic Powdered Metals, Inc.** (149, 151) will feature GEOFLEX Single-Ply Roofing with side-lap and its complete line of cold process patching and reroofing products, highlighting ALUMANATION along with POLY-PLY BUR.

**Reynolds Metals Co.** (1016) will present its closed loop solar system equipment for residential and commercial water and space heating applications.

**Rhoflex, a division of Teltex, Inc.,** (103, 105) will exhibit its solid state thermo fused polymer modified bitumen roofing system reinforced with Trevira polyester. Rhoflex can be used for new or reroofing, flashing or repair, and general waterproofing.

**Rmax, Inc.** (263, 265) will display its complete line of polyisocyanurate foam insulation products for commercial built-up and single-ply roofing systems, including Thermarof Plus and Ply I for the single-ply market and Max I, Thermarof Standard and Thermarof Composite for built-up applications.

**Roofequip Welding Ltd.** (841) will feature its Canadian Mopper with the full width self-cleaning screen, allowing the hand mop to stay with the machine. Wider main wheels and gate valve capabilities allow the Canadian Mopper to also apply vapor barrier, insulation and fiber board.

**Roofing Contractors Association of Texas** (944).

**Roofmaster Products Co.** (504, 614, 616) will feature equipment for solving today's application and material transport problems including the AWA Hydraulic Telescoping Hoist, Zinzer Hot Air Welders, Hot Shot Torches, MSC Aluminum Feltlayers, Dragin' Wagon, Cold Process Systems and time proven Roofmaster products.

**Roof Systems, Inc.** (911) will feature its metal standing seam panels.

**Rubber & Plastics Compound Co., Inc.** (630) will exhibit its full line of waterproofing and roofing specialty products including thru wall flashing, membrane waterproofing, NERVA-FLEX Expansion Joint and NERVA-PLY single-ply roofing in both the ballasted and mechanically fastened versions.

**San Joaquin Refining Co. Inc.** (733) will present its packaged roofing asphalt, coatings and saturants.

**Sarnafil (US) Inc.** (540, 542, 639, 641) will feature its fiber glass and polyester reinforced roofing membranes for reroofing and new construction including fully adhered, ballasted and mechanically-fastened application methods.

**Sawyer's Computer Software & Services, Inc.** (1043)

**Scientific Educational Business Software, (SEBS),** (927) will present ROOFWARE, computer programs for the roofing industry developed by roofing professionals. ROOFWARE is an easy to operate, complete bidding package for material estimates, job control, energy packages, plotter options. It's fast, accurate and dependable for Apple II and Apple III.

**Shelter-Rite Roofing Systems** (762) will feature its FiberTite™ single-ply roof manufactured by Shelter-Rite® Roofing Systems Division of Seaman Corp.

**Shephard Products Co.** (429) will present its Thermo Bar insulative roof sheathing.

**Sibo, Inc.** (943) will present its tapered fiber glass roof insulation that protects buildings from ponded water and high energy costs.

**Siplast, Inc.** (431, 433, 435) will exhibit its Paradiene 20/30 multi-ply system that can be applied by hot asphalt or cold adhesive, the Veral metal clad multi-ply system and Parafor 50, the single-ply system that also may be applied either hot or cold.

**Smith Hoist Mfg. Co., Inc.** (255, 257) will display its Hi-Boy Hoist Master with its 2,000 lb. lifting capacity, the Hoisting Hopper and weight pan.

**Societe Gerland Etancheite** (857).

**Sopreme S.A. Canada, Inc.** (1101).

**Span Metals Corp.** (924, 926) will feature its metal panels for roof, mansard, fascia and Soffit applications available in a wide selection of profiles, widths and colors.

**Specification Chemical, Inc.** (846).

**Speeflo Mfg. Corp.** (1020) will feature its line of conventional finishing systems applied to sandfilled epoxies, heavy mastics and standard roof coatings.

**Ewald Stellrecht** (1104).

**J.P. Stevens & Co., Inc.** (939, 941) will feature its Hi-TUFF® Single-Ply Roofing, a mechanically-attached system.

**Stewart-Warner Corp.** (1061).

**Super "K" Industries, Inc.** (845) will display its tapered roof systems designed to effect positive drainage on flat roofs, cant strips and tapered edge strips in various sizes.

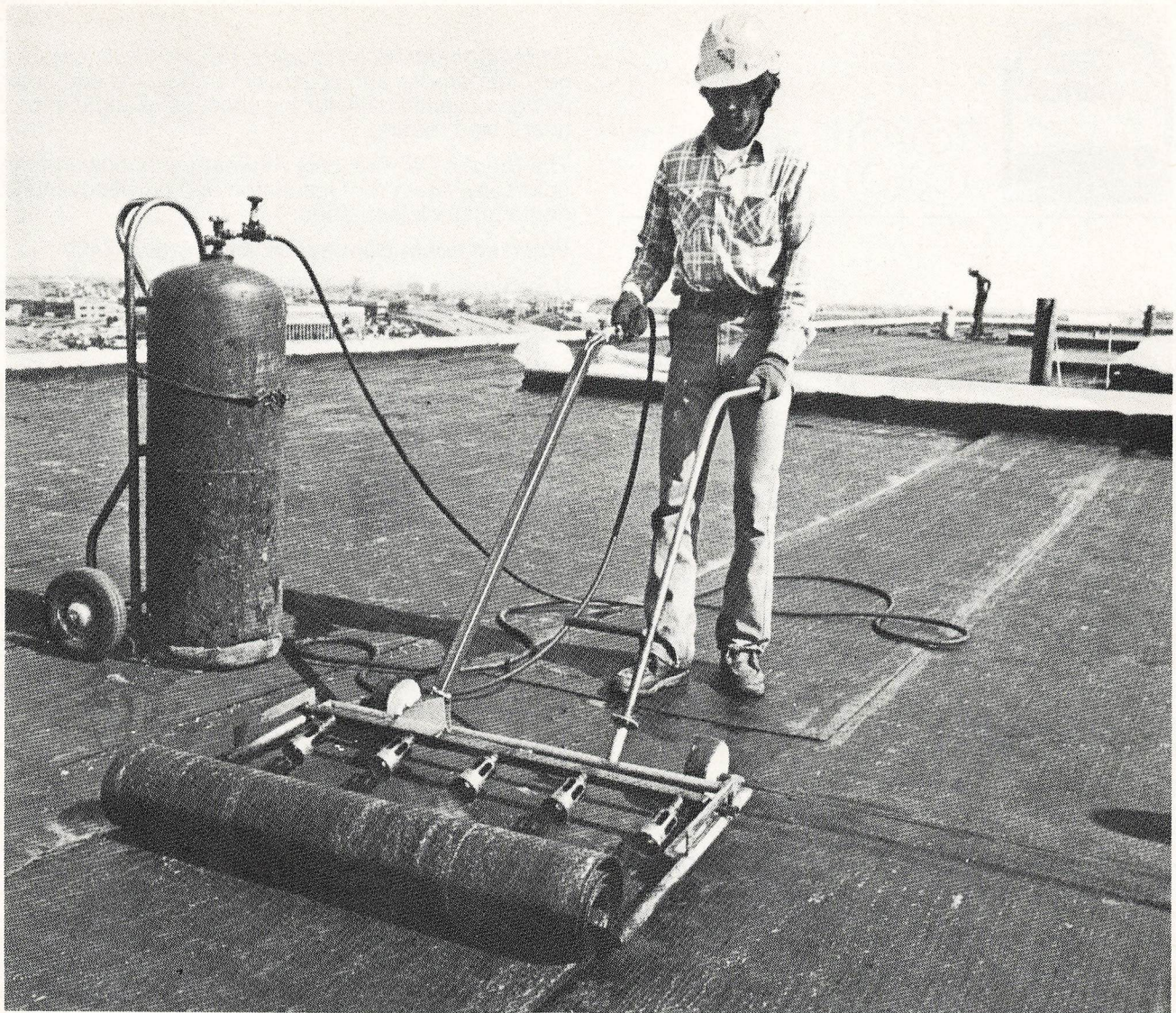
**Supradur Mfg. Corp.** (717, 719) will exhibit its mineral-fiber roofing including Supra-Slate, a shingle with the appearance of natural stone; Western-Shake which has a weathered wood look; American Traditional; Dutch Lap; Twin Lap and Hexagonal shingles.

**SYenergy Methods, Inc.** (658, 660) will present its rubber roof energy system which can be installed in any of three ways: loose laid and ballasted, fully bonded or by SMI's exclusive plate bonding technique.

**Tamko Asphalt Products, Inc.** (318) will feature its complete line of built-up roofing materials, highlighting the TAM-GLASS fiber glass BUR systems and Tamko Awaplan, a polyester based modified asphalt roll roofing material.

**Technicote Corp.** (819).

continued on page 66



## Hot-Shot,<sup>TM</sup> the use-tested torching system For successful heat-fused roofing

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There is a full line of individual components, parts, and accessories, too, all in stock for immediate shipment.

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## '83 Convention Exhibitors

continued from page 64

**Tech Specialties Roofing** (851) will feature its new roof drain designed for single-ply and modified bitumen membranes.

**Tennant Co.** (748) will feature its Roof Scraper which shaves off flint-hard pitch, gravel and slag up to 83 percent faster than hand spudding.

**The Thermal Insulation Manufacturers Assn., TIMA,** (840) will feature urethane roof insulation products for BUR Applications.

**Thermal Systems, Inc.** (161, 163) will introduce THERMAGLAS, a non-composite isocyanurate board approved by Factory Mutual and Underwriter's Laboratories for single-ply or built-up application directly onto steel decks.

**Thermo Materials, Inc.** (716) will feature Cold Process Systems for new and reroofing.

**Three E. Corp.** (919) will feature its Self-Adhesive Single-Ply waterproof membranes, coatings, and flashings.

**ThyCurb Div. of Thybar Corp.** (932) is exhibiting its complete line of prefabricated roof curbing, custom designed to match any type of single ply or built up roof and any manufacturers roof top equipment.

**Timberline Systems** (1042, 1044).

**Tramex Electronics, Inc.** (760).

**Transmet Corp.** (664) is introducing its new aluminum roofing chips, designed to protect the surface of a built-up roof and conserve building cooling energy.

**Tremco, Inc.** (133, 135) will display several new products and systems, including TremPly Adhered and Ballasted Single-Ply Roofing Systems, BURmastic cold process built-up roofing system using fiber glass plies and ECOlastic, an ecologically clean treatment for preserving built-up roofing membranes.

**Tropical Industrial Coatings, Inc.** (718) will feature its TROPIGARD System which utilizes a prefabricated sealing edge on a 100 mil sheet. A complete line of heavy duty maintenance products will also be displayed.

**Troup Industries, Inc.** (827, 829) will exhibit its "one of a kind" single-ply roofing machines, highlighting the new Speed Bead which is designed to apply lap sealants faster, easier and with less cost.

**Troxler Electronic Laboratories, Inc.** (1023).

**Truck & Equipment Service** (945, 947, 949) will present its Roofer's Hi-Lift Combination Dump Truck.

**Trumbull Asphalt** (559, 561) will review the line of built-up roofing asphalts.

**Uniroof Ltd.** (1015).

**United Construction Products, Inc.** (147) will feature its general purpose and specialty torches and equipment designed specifically for the successful application of heat fused roofing.

**The Upjohn Co.** (563, 565) will feature its polyurethane rigid spray foam roof insulation and polyisocyanurate rigid bunstock insulation.

**Urethane Foam Contractors Association** (749).

**U.S. Gypsum Co.** (1105, 1106) will feature its FOAMULAR® Insulation, a rigid, lightweight panel of highly water-resistant extruded polystyrene foam.

**U.S. Intec, Inc.** (141, 143, 145) will present its Brai Roofing/Waterproofing membranes which are APP modified bitumen, torch applied and offered with either polyester or fiber glass reinforcing.

**Vacuum Engineering Corp.** (364, 366, 463, 465) will exhibit its VEC Loaders™ and Wet Head® attachments for maximum production of gravel removal and Wet Head blast washing for optimum roof surface preparation.

**Vermont Structural Slate Co., Inc.** (101) will have on display samples, showing its handcrafted roofing slates. The display will also show the available colors as quarried from the company's facilities in southwestern Vermont.

**Vertical Market, Inc.** (1041).

**Vincent Brass & Aluminum** (162, 164).

**Wasco Products, Inc.** (634, 636) will feature its complete line of architectural, solar and standard skylighting systems.

**Wat Pro, Inc.** (644, 646).

**Wausau Tile** (1027) will present elastic, vulcanized rubber terrings® that are used for pre-cast concrete paver support systems and provide uniform joint width to allow below-surface drainage.

**WeatherGard Roofing Systems, Inc.** (1052) will feature its Single-Ply EPDM Elastomeric Roofing Systems designed for both new construction and remedial reroofing as a replacement for the conventional built-up roof available from WeatherGard.

**Weather-Shield, Inc.** (861) will present its FLEXHIDE single-ply systems applied as one continuous monolithic covering, loosely laid and ballasted or mechanically spot attached to the deck.

**Weathershield Systems** (824, 923).

**Brian R. White Co., Inc.** (724, 726, 823, 825) will present the Leister line of Hot Air Sealers and its automatic tools including the Variant X-10 and the new Variant 100 for sheeted bituminous roofing systems.

**W.J. White Co.** (1024).

**Wilen Mfg. Co.** (928, 930) will display its various types of Roofing Mop Yarns put up in hanks, screw type or pin type, and accessories.

**Witco Chemical Corp.** (860, 862).

**Wrisco** (1038).

**York Mfg., Inc.** (720) will present its copper laminated flashings and SUPERFLASH Roof Accessories.



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ROOF • PIPE • MACHINERY LEAKS!

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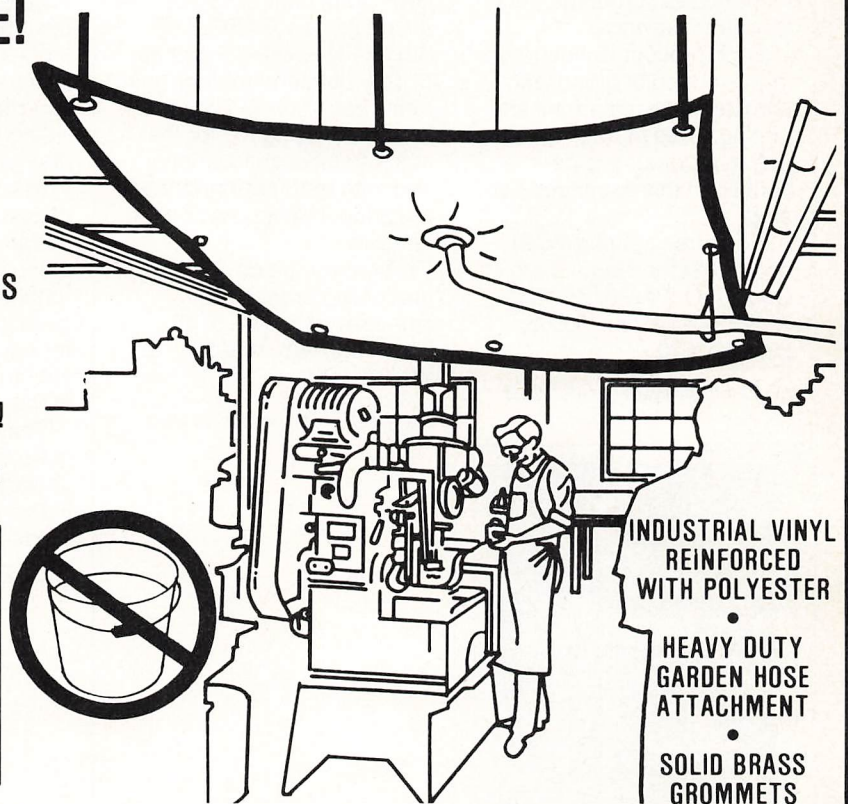
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3' x 6' — \$38.25	6' x 6' — \$44.75
3' x 8' — \$39.85	6' x 8' — \$48.50
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Water so essential to life and yet it can be your worst enemy when you least expect it.

At last a product has been developed to make those untimely leaks a little less frustrating.

Our Water Diverter protects those valuable areas and equipment from roof leaks until a more permanent solution can be accompanied.

It is our opinion that every building that has a fire extinguisher in case of a fire, or a first aid kit in case of an injury, should have at least one Water Diverter in case of a disastrous roof leak.

It is better to have one and not need it, than - to need it and not have it.

Water Pails in the middle of the floor are not considered Fire Protection.

Keep the buckets out of sight - liability claims are there already.

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## New Catalog From Seton Free For All

Seton Name Plate Corp. is offering a new 1982-83 catalog that contains more than 240 identification products at factory-direct savings.

Each product is illustrated in full-four color along with complete specifications and pricing. Over 14 new identification products are described in this expanded catalog.

For a free catalog (83-B) contact Seton Name Plate Corp., P.O. Drawer ZE-1331, New Haven, Conn. 06505; 203/772-2520.

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## New One-Ply System Now Available From GAF

GAF Corp. recently introduced its new GAFPLY EP Single Ply Roofing Systems.

The rubber membrane systems, based on EPDM membrane, are designed for fast, cost-effective applications and long term performance requiring a minimum of maintenance.

For literature on GAF Corp. products, contact the company at 140 W. 51 St., New York, N.Y. 10020; 212/621-5000.

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## Paver Stones On Pedestals For Better Rooftop Drainage

Pave-El® paver pedestals are designed to raise paver stones above the surface of roofs, water-proofed plazas and other deck areas providing the best possible drainage.

In addition, the Pave-El® pedestal system elevates and uniformly spaces paver stones for a secure, fully functional walk surface. The pedestals also compensate for any unevenness of the substrate or the actual paver stones.

They are easy to install, require little maintenance, and provide for longer membrane life while maintaining thermal efficiency.

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## Rubber & Plastics Has Brand New Spec Data

Rubber & Plastics Compound Co., Inc., makers of Nervaply® ballasted and unballasted single-ply roofing membranes, have announced the availability of a new, color brochure outlining the details of the firm's product offerings. The brochure contains spec data on the Nervaply® systems complete with detail drawings and application procedures.

Rubber & Plastics Compound Co., Inc. has been a supplier to the roofing and waterproofing industry for the last 40 years. For more information, please contact Mr. Al Farbish, Rubber & Plastics, 36-15 23rd St., Long Island City, New York 11106.

Check #44 on Reader Service Card

## Swedish Firm Now Selling New Product Concept In U.S.

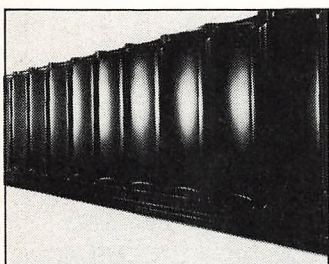
PLANNJA® a subsidiary of Svenskt Stal AB (Swedish Steel Corp.) has developed a new product concept for residential roofing, SCANROOF®

SCANROOF® has a "built-in" z-purlin which makes the product both a roofing material and a self-supporting structural membrane between the rafters, eliminating the traditional plywood deck.

The product can be used for new construction and reroofing. In reroofing, SCANROOF® goes directly on the existing asphalt shingle roof without stripping.

PLANNJA® is a leading company on the Scandinavian and European market in developing and marketing steel sheet building products.

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## Cart For Field Use Of Infrared Systems

A new aluminum transporter cart that makes complete infrared radiometer systems fully portable for field or laboratory use is now available through Inframetrics, Inc.

The Inframetrics Field Two-Wheeler houses a complete infrared radiometer system. Featuring pneumatic tires for smooth travel, it carries a scanner on telescoping monopod with pan head; four-inch black and white television monitor; Polaroid assembly; electronics / control unit; videocassette recorder; remote control pad for VCR; 12V battery plus spare and a microphone mount.

It is constructed of welded aluminum, measures only 23" x 14" with adjustable heights from 35-50" and weighs 23 lbs. unloaded.

For more information contact Robert Bruno at Inframetrics, Inc., 25 Wiggins Ave., Bedford, Mass. 01730; 617/275-8990.

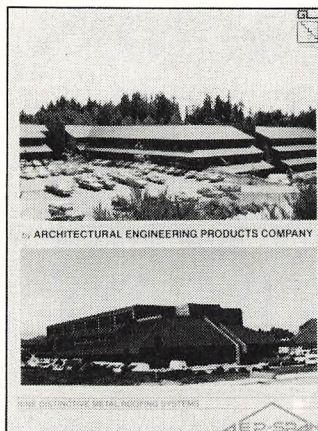
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## Booklet Features Newest In Metal Roof Design

Color photographs, drawings and descriptive copy describe nine metal roofing systems in AEP/Span Metal's 1983 Metal Roofing Systems catalog.

The 16-page brochure is available through Span Metals Corp., P.O. Box 26288, Dallas, Texas 75226; 214/827-1740.

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## New Fastener Designed For Built-Up Roofs

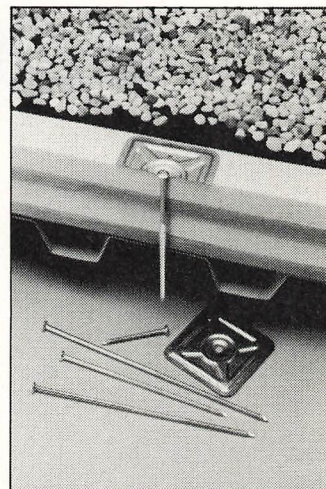
Elco Industries, Inc. now offers the Tapdek™ Roof Fastening System.

The system consists of a fastener and steel stress plate to fasten rigid roof insulation to commercial and industrial metal roof decks of 18 to 22 gauge.

The Tapdek fastener is designed with deep thread-forms. The drilling point is engineered to cut quickly for fast installation.

The product is available in eleven lengths, ranging from 1 5/8" to 12".

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## NRCA Members Assist In The Disney Fantasy

# Four Member Contractors Build The Roofs Over EPCOT

By Connie Arkus

▲ The German platz is complete and just waiting the arrival of the Oompah band. Giffen Roofing Co. did the white built-up roofs (carpenters put up the wood shakes).

Welcome to EPCOT Center—the gateway to the world and into the future. Two-layer insulation with Celotex organic felts and gravel metal decks were used throughout the Spaceship Earth Complex. The inverted roof system was used for the Central Energy Plant. ▶

“Challenge — it’s kind of fun to do the impossible.”

Walt Disney

**H**ow do you construct a fantasy? Four members of the National Roofing Contractors Association (NRCA) will tell you that it’s always possible with some single-ply and built-up roofing and good old-fashioned hard work.

Each company took ordinary roofing products and transformed them into Chinese pagodas, Mexican pyramids and the global Spaceship Earth for Walt Disney’s Experimental Prototype Community of Tomorrow, EPCOT Center, near Orlando, Fla.

Giffen Roofing Co., Orlando, Fla., E.C. Goldman, Inc., Winter Park, Fla., Standard Roofing Co., Montgomery, Ala., and J.P. Fyfe, Inc., Clinton, N.J. are the NRCA member firms who tackled the Disney dream and captured its mythical allure. The project was also a dream come true for area contractors boosting an otherwise sluggish summer construction period.

Disney planners set the October 1, 1982 completion date in 1978, and contractors had to work plenty of overtime to finish the 260 acre park on schedule. And because the contractors were dealing with the Disney organization, the miraculous did occur as scheduled.

EPCOT is divided into two distinct sources of entertainment. The Future World pavilions explore the different aspects of human technology, its development and potential. The World Showcase complex celebrates the culture and tradition of nine countries, the U.S.A., Canada, Great Britain, France, Japan, Italy, Germany, China, and Mexico, with Israel, Equatorial Africa and Spain showcases to follow soon.

“It’s got to be one of the wonders of the world,” said J.C. Fyfe President John deLage.

Visitors to the park will enjoy the special Disney touches that turn the ordinary into magic, however, they won’t have any idea of the magnitude of the undertaking in roofing alone.

### Giffen

“We have been working on the EPCOT project for approximately 30 months,” said Jim Warner, vice president, Giffen Roofing Co. “We completed just over 670,000 square feet of varied roofing on 12 projects, complexes or pavilions.”

Giffen representatives could say that their company roofed most of the North American continent and half of Europe — well, almost. The United Kingdom, Italy, Germany, United States and Canada Showcases, and The Land and Communicore pavilions all came under the Giffen roofing domain.

The United Kingdom complex includes four buildings: An authentic British pub called the “Rose & Crown,” a white Gazebo placed in a picturesque park, a toy and gift shop and a china and biscuit shop. Roofing materials used for the U.K. were; three different colors of Vermont slate, terne coated standing seam metal roofs, mineral surfaced built-up roofs, Hitchen’s Nuralite modified bitumen roofs, custom “Brittany and Roman” clay tile and W.R. Grace’s GRM-120 as underlayment for simulated straw thatched roof.

St. Mark’s Square, a *campanile* (bell tower), and an

angel statue encased in gold leaf immediately identify a piazza as the Italian Showcase. This project of 19,100 square feet included standing seam terne metal roofs, mission clay tile and mineral surfaced built-up roofs with custom-made copper gutters and downspouts.

An authentic German plate with a *glockenspiel* (clock) and an oompah band playing in a nearby biergarten give the German Showcase its old world charm.

"In addition to the 38,500 sq. ft. of mineral surfaced built-up roof," Warner said, "we installed Nuralite roofing, copper standing seam roofing, terne coated metal standing seam roofing and custom fabricated all conductor heads, downspouts, gutters and several bell, clock and roof towers of terne metal."

The American Showcase achieves the colonial affect with federal architecture modeled after Philadelphia historic landmarks. The project, which spans 80,900 square feet, included mineral surfaced built-up roofs,

Dow Chemical's Inverted Roofing Membrane Assembly (IRMA) with river gravel ballast, simulated slate roofs at the fascia or mansard and standing seam terne metal roofs, with three custom made bell/clock towers of terne coated metal.

Canada wouldn't be Canada without the Rocky Mountains, so Disney "imagineers" and Giffen experts made mountains out of molehills.

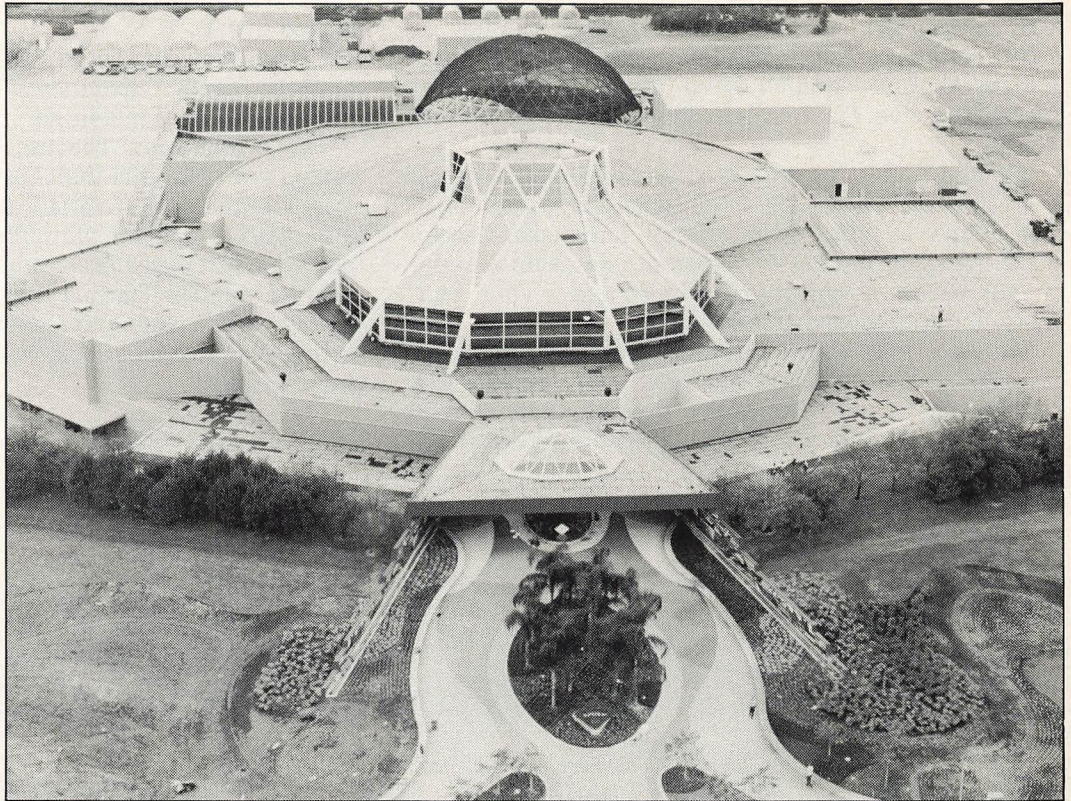
The Circlevision Theatre, 14,400 square feet, was roofed with Nuralite then covered by a glass fiber and steel mountain. A waterfall runs down from inside the mountain, and all the plumbing, planters and steel supports run just over the completed roof.

The Canadian Trading Post & Tourism building was roofed with hand-split cedar shakes and fish scale shingles — red cedar shakes with rounded ends and a smooth finish.

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continued on following page





The Land Pavilion is the park's largest structure, spanning six acres.

The "hotel" Chateau Laurier has a standing seamterne coated metal roof, 6,800 square feet, which was 45 to 65 ft. high, 10/12° pitch or higher, and required custom made, standing seam roof with over 40 dormers and five changes of pitch.

And how do you roof the park's largest pavilion, spanning six acres where inside a boat takes journeyers through three different climates, a full-scale farm and several experimental growing rooms?

Giffen selected Nuralite, with light-weight concrete deck, Owens Corning Fiberglas (OCF) Perma Ply-R as base ply, nailed to deck with modified bitumen overall.

W.R. Grace's GRM-120 with white coating roof system was placed over lightweight concrete deck with OCF Perma Ply-R used as a base ply sheet for the crescent-shaped Communicore East and West Complexes. Also included was approximately 3,800 lin. ft. of shop fabricated coping cap and fascia formed to a continuous radius.

For the main entrance and Spaceship Earth complex, two-layer insulation with Celotex organic felts and gravel metal decks were used throughout. The IRMA roof system was used for the Central Energy Plant.

## E.C. Goldman

The focal point of EPCOT Center is Spaceship Earth, a 165-foot diameter geodesic sphere which is equal to an 18-story building in height. The park's theme structure contains a spiralling ride that takes travellers back in time to when the earth began and then projects them into the future as the vehicles pass life-size scenes in the de-

velopment of human communications with audio-animatronic figures. E.C. Goldman, Inc. worked on the global structure.

President Tom Drake explained that E.C. Goldman did 98 percent of the roofing for the Walt Disney World Theme Park, so the firm was familiar with turning dreams into reality.

Drake explained the necessary ingredients for making Spaceship Earth: "A network of steel beams created a maze of steel divided into approximately 950 triangular frames. Between the frames were installed triangular steel panels with 1/16" cured neoprene applied by Gates Engineering Co. After erection of triangular panels, steel closure strips were installed across all seams and the closures were covered with neoprene to give a completely neoprene wrapped structure. Aluminum hubs, projecting approximately two feet out from the inner surface provided the support for the exterior surface." (E.C. Goldman did not perform any work on the outer surface).

"While the steel framing was being built, the contract delivered the steel panels which averaged twelve feet in length for each side of the triangle. These panels weighed 400 lbs. each. A special, two-part adhesive was used to bond the neoprene to the panels."

In addition to Spaceship Earth, E.C. Goldman did a great deal of specialty metalwork throughout the EPCOT site and installed the roofing and sheet metal work on the China Showcase.

The Chinese ambassador visited the grounds to view the *Temple of Heaven* and explained that many different

continued, page 74

# ESTERDAN

## The Answer

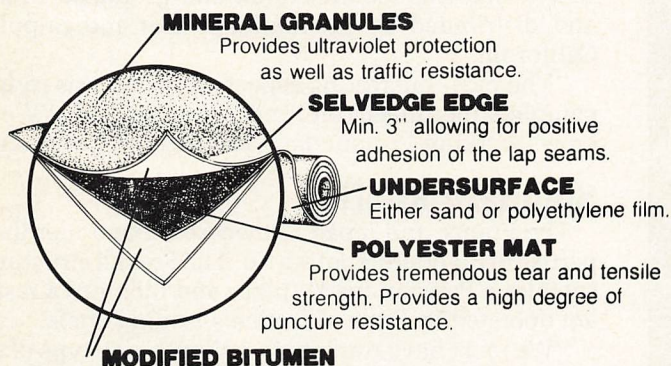
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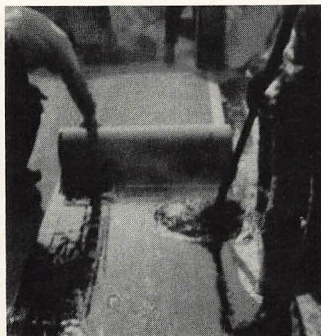
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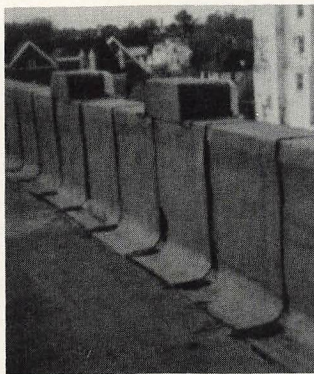
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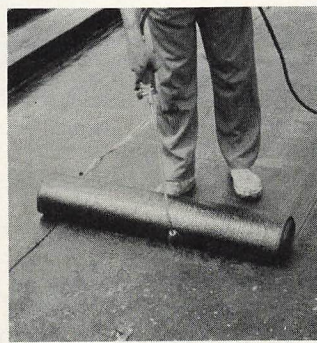
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angles on the roofs were needed to capture the authentic Chinese look, according to *Orlando Magazine* Editor and Publisher, E.L. Prizer.

Drake said that W.R. Grace CRM single ply was used in creating the ornate pagodas and for the CircleVision Theater where visitors can catch a glimpse of eastern life in the first film made by Americans in China since communist rule.

Several difficulties the company encountered on the project were "keeping the air bubbles out of the adhered



A terne-metal roof tower resembles its German counterpart under the direction of Giffen Roofing Co.

system" and "coping with the elements — the rain and heat," according to Drake.

The Central Florida Builders Exchange recently presented its Craftsmanship Award to Tom Jessen, E.C. Goldman's foreman in charge of the EPCOT project, in recognition of "exceptional craftsmanship in neoprene membrane waterproofing Spaceship Earth."

"We are, indeed, proud of our accomplishments on this project," Drake said about the construction that brought about \$3 million of work to the firm.

## J.P. Fyfe

J.P. Fyfe, Inc. worked on the Mexico Showcase, the Odyssey and Cantina restaurants and a restroom. The Mexico pavilion is an incredibly realistic replica of a Mayan pyramid that looks like it was actually made of hand-cut stone and aged through the centuries.

Zonolite deck, GAF Spec 203 AN was used on the

large, 52,000 to 54,000 square foot structure, according to Fyfe President John deLage.

"The pyramid is actually an optical illusion," deLage said. "It's a series of levels and a top level; each level is similar to a small plateau."

Making the building look like it was plucked from the Yucatan Peninsula was not an easy feat, but deLage took the project in stride: "There was nothing that unusual about the job or too difficult."

The Odyssey East restaurant complex involved about 42,000 square feet of roofing. The Cantina Restaurant roof consisted of Spanish tile — Ludowici straight barrel mission tile — and some built-up roofing.

The restroom was constructed out of Japanese clay tile, which was manufactured and produced in Japan and distributed by International Tile and Supply in California.

"The most interesting aspect of the job was trying to complete the project on time," deLage said. "We had crews working 12-hour days, evenings and weekends."

## Standard Roofing

The France and Japan Showcase came under the expertise of Standard Roofing Co. The French structure resembles a Parisian marketplace and includes a restaurant operated by three of France's leading chefs.

"We must have run into just about every type of roofing imaginable," said Vice President Robbins Taylor, Jr. "We used an IRMA roofing system, slate shingles, wood shingles and a tremendous amount of metal roofing," Taylor said. A replica of the Eiffel Tower, was placed on top of the IRMA roof.

Bonsai Gardens, an ornate tempura house, Sishinden Hall and a feudal castle comprise the Japan Showcase. Cedar bark shingles were installed in an unusual fashion for an aged appearance.

"First we installed a section of shingles the way we usually do — straight," Taylor said. "Then a Disney artist came by and said, 'Oh, no, we want them crooked to look older.' So we redid the section, making the tiles crooked and the artist came back and said, 'Beautiful!'"

The total square footage for both the France and Japan structures included approximately 60,000 square feet of built-up roofing, 30,000 square feet of shingles and 15,000 square feet of metal roofing, according to Taylor.

"It wasn't a large job in area, but it was very detailed, meticulous work," Taylor explained. "It required a lot of attention to detail with several hundred change orders."

Transforming the common into the majestic is the Disney style of entertainment and success. This time the magic was used to create a very special, worldwide feeling of camaraderie in the form of EPCOT Center.

The "attention to detail" that Taylor spoke of is the hallmark of all Disney endeavors and the trademark of four of the best roofing contractors in the industry.



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\_\_\_ NRCA Roofing Materials Reference Guide — *Charles Griffiths* ..... \$ 8.00  
 \_\_\_ Rap Session: Built-Up Roofing — *Panel Moderator, Country Harrison* ..... \$ 8.00  
 \_\_\_ Rap Session: Elastoplastic — *Panel Moderator, Cy Tilsen* ..... \$ 8.00  
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# Classified Ads

Place a classified ad in *Roofing Spec* for 50 cents per word. There is a minimum charge of \$20. Boxed or display advertisements are available in the classified section for \$40 per inch (one inch minimum). Ads using blind boxes available at no additional charge to NRCA members; non-members add \$10 to total order. Send ad copy and payment to: Advertising Manager, *Roofing Spec*, 8600 Bryn Mawr Ave., Chicago, Ill., 60631.

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The NRCA Centennial Committee recently approved the official logo for the association's rapidly approaching 100th anniversary. The logo will appear on all official centennial correspondence and related printed materials, according to Beverly Kruger of the committee.

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# Tech Talk

By Bob LaCrosse, CAE  
Director of Technical Services

## Roof Inspection & Maintenance

The roof is the most vulnerable part of the building exposed to the elements. The built-up or elastoplastic roof is rarely seen. Therefore, it often suffers from being neglected until serious, expensive trouble suddenly appears.

The best designed and applied roofing systems cannot be expected to reach a full-life expectancy without proper inspection and maintenance. Any roof requires maintenance to insure its continued serviceability because it is subject to damage from foot traffic, extreme weather, abuse, stress concentration and even vandalism. It is absolutely imperative that minor repairs be made immediately to prevent further deterioration of the roof system.

All roofs require periodic inspection and maintenance to achieve maximum roof life. While complex and major repairs and some maintenance should always be performed by qualified roofing contractors, building owners can help maintain roofs with regular clean-up procedures. The designer and roofing contractor should make the owner aware of these procedures after the roof is constructed.

According to the *NRCA Roofing & Waterproofing Manual*, an intelligent roof inspection and maintenance program should always provide for the following:

### Owner Inspection and Maintenance Recommendations

- Inspect the roof at least twice yearly, in the spring and fall, and inspect all roofs after any severe storm. Make frequent inspections on buildings housing manufacturing facilities that evacuate exhaust debris onto the roof. Clean roof drains of debris. Remove leaves, twigs, cans, balls, etc., which could plug roof drains. Bag and remove all debris from the roof since debris on the roof surface will be quickly swept into drains by heavy rains causing drainage problems.
- Notify the roofing contractor immediately after a roof leak occurs. If possible, note conditions resulting in leakage; heavy or light rain, wind direction, temperature and the time of year the leak occurs are all important clues to tracing roof leaks. Note whether the leaks stop shortly after each rain or continue to

drip until the roof is dry. If the owner is prepared with facts, the diagnosis and repair of roof problems can proceed more rapidly.

- File all job records, plans and specifications for future reference. Set up a maintenance schedule. Record maintenance procedures as they occur. Log all access times and parties working on the roof in case damage should occur.
- Do not allow foot traffic on the roof in very cold or very hot temperatures as damage can result. Do not allow the installation of television and radio antennas or mechanical equipment without notifying the roofing contractor and consulting with him about the methods and details for these installations. One of the keys to avoiding roof damage is the key to the padlock on the roof hatch! Allow only authorized personnel on the roof.
- In emergency situations, patch leaks to minimize property loss.
- Except for emergency situations, do not attempt owner-performed roof repairs. The puncturing of a blister or the spreading of a coating or mastic only covers up evidence the roofing contractor needs to ascertain the problem. Do not consider using maintenance coatings, "resaturants," sprays or "miracle" products without consulting a qualified roofing contractor.

### Roofing Contractor Maintenance Recommendations

After completion, each roof is subjected to various weathering conditions. Roofs do not wear uniformly since certain areas may be affected more severely than others. Equalizing wear by upgrading worn areas is the secret to prolonged roof life. To equalize wear the maintenance and repair of these areas should be done by a qualified roofing contractor. Maintenance may be as simple as regraveling a windswept corner, or more complex, such as correcting a water ponding problem; maintenance is a necessary part of good roofing practice.

Many companies and organizations have outlined recommendations for roof inspection and roof maintenance, NRCA encourages such recommendations. To assist in establishing an inspection or maintenance program, refer to the following publications:

- NRCA/ARMA Manual of Roof Maintenance and Roof Repair*, available from the NRCA Roofing Service Center.
- Roof Maintenance, and Maintenance and Repairs*, available from The Roofing Industry Educational Institute, 6851 S. Holly Circle, Englewood, Colo. 80112.

Periodic roof inspections and a good maintenance program can add trouble free years of service to a roof system and save money and avoid serious failure in the long run. Roofs are comprised of a number of materials and combined a number of ways. Some are fragile. All are subject to stresses and deterioration from the elements and man. A program of inspection and maintenance is necessary to maintain the integrity and gain the best performance of the roof system.



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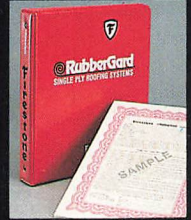
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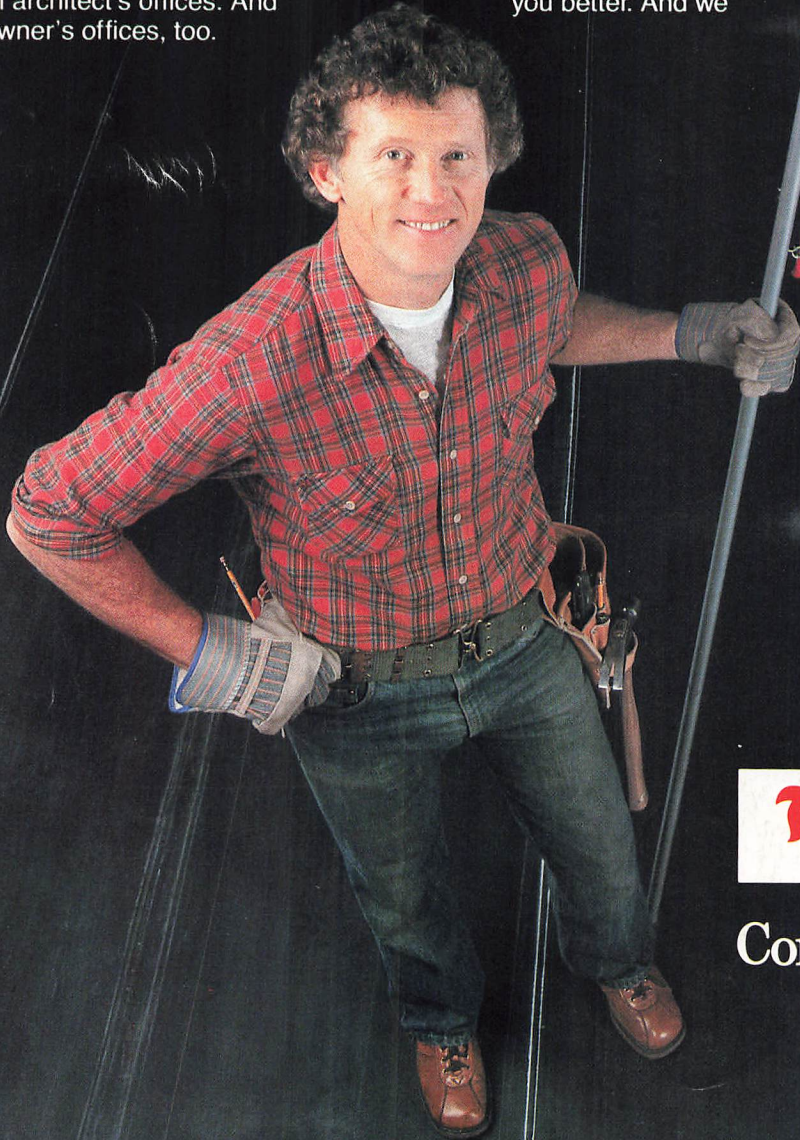
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