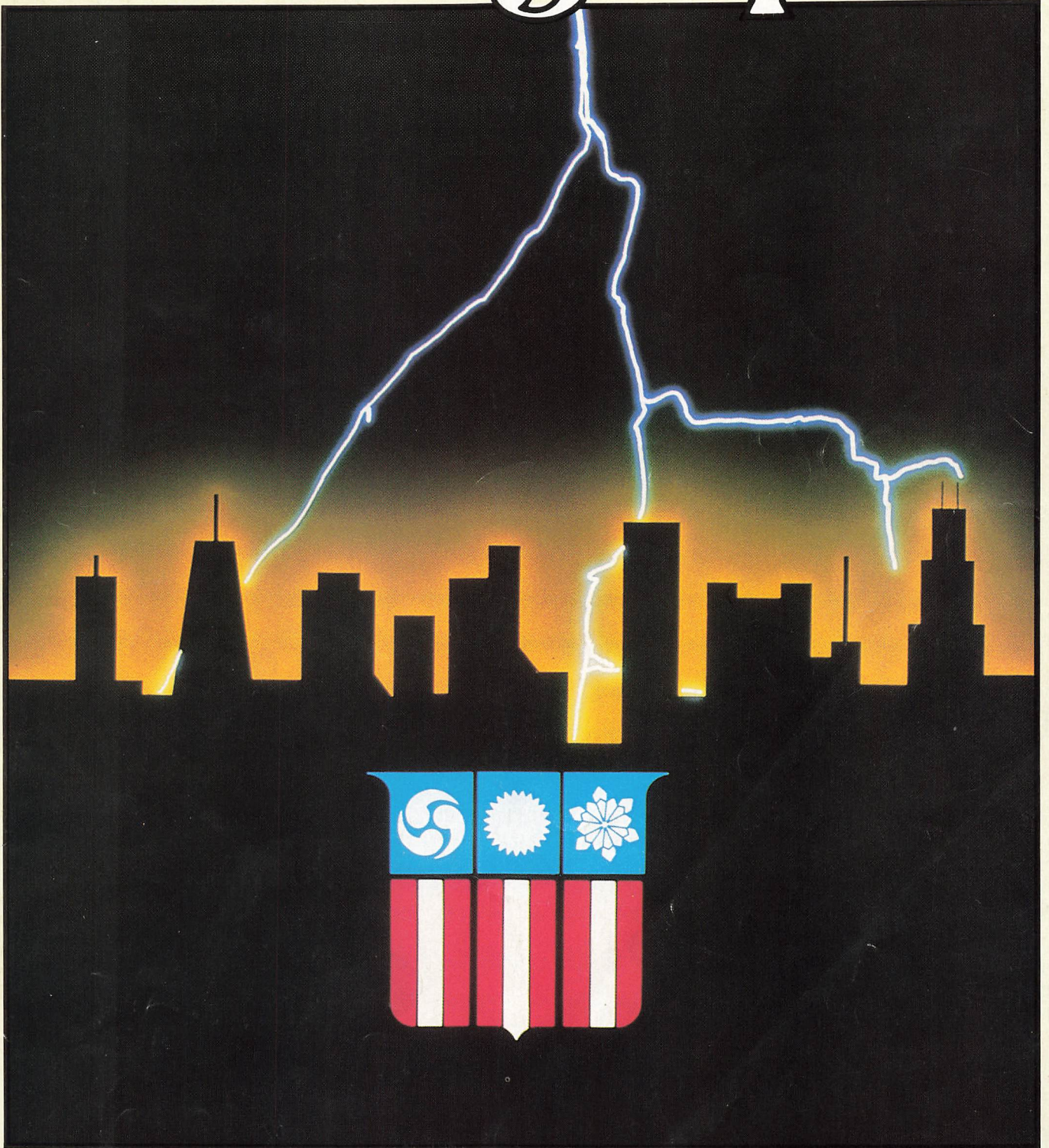


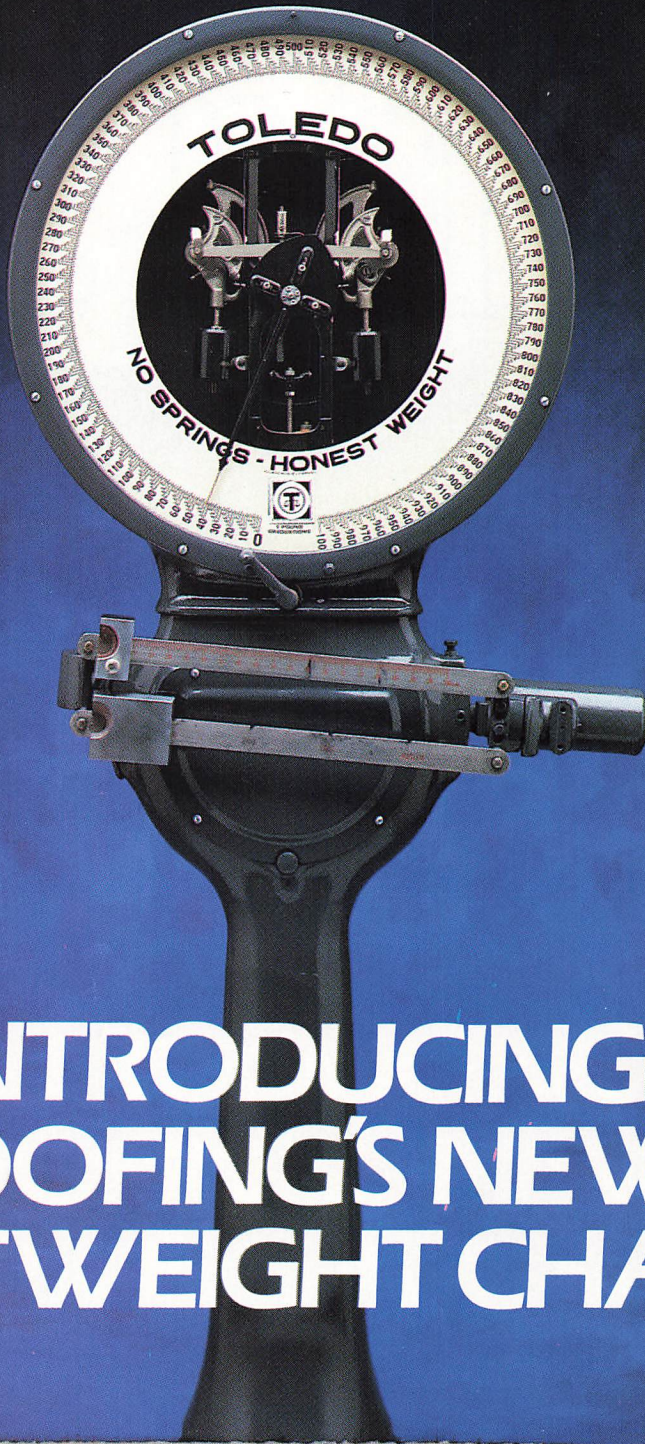
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National Roofing Contractors Association

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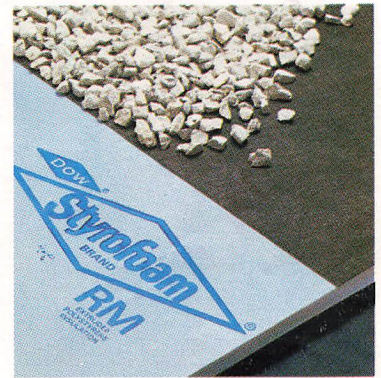
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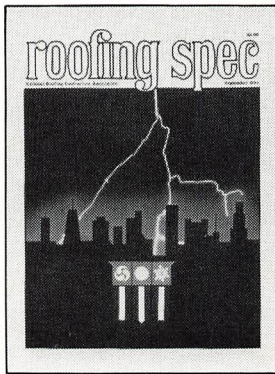
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Staff

William Good, CAE,
Executive Editor
Michael H. Beightol, Editor
Connie Arkus, Associate
Editor
Martin Eastman, Editorial
Assistant



The NRCA logo represents how the roofing industry protects folks from the elements of wind, sun and precipitation.



NATIONAL ROOFING CONTRACTORS ASSOCIATION

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(312) 693-0700

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Comment

At Last, Normalcy

It's September: the recession is ending, the Cubs are fighting for last place, and there are other indications of a return to normalcy.

For one thing, there is an emerging sense of cooperation between the roofing manufacturer and the roofing contractor, after several years of creeping antagonism. This teamwork philosophy was mandated, to a large degree, by a marketplace that was truly chaotic; it is, nonetheless, refreshing. The Asphalt Roofing Manufacturers Association (ARMA), the Thermal Insulation Manufacturers Association (TIMA) and the Single-Ply Roofing Institute (SPRI) have all taken recent, positive actions which recognize the importance of having a unified industry approach to our problems. Their efforts are praiseworthy.

For another thing, the federal bureaucrats are back nipping on our heels, after a couple of years of worrying about job security. This is refreshing, too, in the sense that jet engines are refreshing: they may be loud and bothersome, but it's nice to be reminded

occasionally that the damn things are working. Our industry can expect to respond to the environmentalists and to OSHA in the months ahead.

Also, there is some normalcy to economic recovery. Many firms discovered that cutbacks and layoffs made them leaner and even more profitable. Management energies that went into survival for two years must now go into hiring, training, advertising and promotion. The industry has learned from the experience of severe recession that marketing and promotion will forevermore be a vital part of a contractor's operation.

So, too, has the demand for leadership from NRCA been what should be expected from these developments. It is not surprising to learn that our areas of emphasis for the next several months will be worker training, marketing and promotion, and government relations. NRCA emerges from the recession as growing, dynamic and responsive.

This is all encouraging stuff. And who knows? Maybe the Cubs can finish fifth.

Bill Good

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Ideas, notes and random thoughts

Sometimes a roofing contractor's biggest headache is the same thing folks worry about before the weekend; what's the weather like? Torrential downpours in Florida, golfball-size hailstones in Colorado, blizzards in Upper Michigan and the sun's heat in Arizona — these are the everyday concerns for the roofing professional.

In this issue of *Roofing Spec*, we'll look at a few of the ways the weather effects our industry with information from the NRCA Energy Manual, a report on wind uplift by Thomas Kelly of Kelly Energy Systems, and Marty Eastman's look at insulation.

Also included are the results from NRCA's Project Pinpoint, and Associate Editor Connie Arkus' report on the growing use of computers by NRCA contractors. Enjoy.
m.b.

NRCA members need to take note! The Centennial Fundraising effort is your chance to participate in a massive public relations effort aimed at improving the image of roofing contractors. NRCA leaders, under the direction of President Burt Karp and Senior Vice President Wayne Mullis, are preparing a public relations campaign of unprecedented proportions. Please be sure to read the Executive Committee Memo in this issue's Member Supplement, and stay tuned for more details. Finally, your donation to the fund is important for the success of the program. Thanks!

Convention time '84 is fast around the corner, and NRCA is hard at work gearing up for the industry's biggest annual roofing fest. The 1984 NRCA Convention & Exhibit will be held in Atlanta, Feb. 14-17

with all exhibits in the splashy Georgia World Congress Center. Participating hotels are the Westin Peachtree Plaza, the Hyatt Regency, the Atlanta American, the Omni Hotel, the Hilton and the Marriott. The trade show is nearly sold out with over 651 booths representing an amazing 264 companies. On Feb 16, NRCA will conduct an Early Bird Session on "Metal Roof Systems." The speaker for the popular Member Breakfast will be Dr. Norman Vincent Peale, and a few of

the Business Sessions include, "Guidelines For Establishing Roof Maintenance Programs," "NRCA Recommended Application Tolerances" and "What's Happening To Built-Up Roofing," conducted by the Asphalt Roofing Manufacturers Association. More information will soon be available from the NRCA Meetings & Conventions staff.

Junk mail is getting fatter, says the U.S. Postal Service. In the first quarter of 1983, over 360,250 tons of third-class, presorted, commercial mail was moved by the Post Office. That's a 23 percent increase, but the total number of pieces handled rose only 14 percent.

Recalling a "little known slice of history," Richard Leshner, president of the U.S. Chamber of Commerce, recalled recently that Herbert Hoover made the mistake of raising taxes in a recession and of signing a protectionist trade bill, the Smoot-Hawley Tariff Act, in 1930. "It is important to keep Herbert Hoover and his response to the 1929 recession in mind as we listen to present day politicians explain their 'solutions' to today's unemployment," Leshner said. "They want to raise taxes. Just like Hoover did. They would bring back protectionism. Just like Hoover did. And they would pass more make-work jobs programs. Just like Hoover.

"And they would trigger another depression. Just like you know-who."

"Fortune, men say, doth give too much to many. But yet she never gave enough to any."

Sir John Harrington

National Roofing Foundation Update

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For more information contact the NRF headquarters, 8600 Bryn Mawr, Chicago, Ill. 60631.

May Construction Sets New Record With Contracts Totaling \$18.9 Billion

Contracting for new construction soared to an all-time high in May, with contracts totaling \$18.9 billion, according to the F.W. Dodge Division of McGraw-Hill Information Systems Company.

The month's newly started construction lifted the seasonally adjusted Dodge Index to a record 148, up 15 percent from April's 129. The previous high of 143 was reached in February 1979, just prior to the era of wildly gyrating interest rates.

"May was one of those months when everything came up pluses for the construction industry," said

George A. Christie, vice president and chief economist for F.W. Dodge. "Across-the-board advances in housing, nonresidential building and public works construction got the added support of a \$2.1 billion electric power plant started in Utah.

"While it was the huge utility project that boosted contracting into the record-breaking zone, May would have been a strong month even without this exceptionally large job," Christie said.

May's biggest project, the \$2.1 billion second unit of Utah's Intermountain power facility, brought

total nonbuilding construction contract value to \$5.5 billion for the month. After seasonal adjustment, May contracts for nonbuilding construction — which includes public works and utilities — advanced 31 percent from April's value.

The start of the first section of the Intermountain complex was reported in December 1982 at \$2.2 billion. Original plans called for a total of four units at a combined cost of well over \$8 billion, but the two remaining units have been cancelled, according to Christie.

Nonresidential building turned in a surprising 10 percent seasonally adjusted gain in May, as \$5.2 billion (unadjusted value) of new commercial, industrial, and institutional construction got under way. May's spurt followed a relatively weak April rate of contracting.

Commercial and industrial building provided the nonresidential thrust in May, posting double-digit gains in contracting for stores, warehouses, offices, and factories. Institutional building held even with the previous month.

Through five months of 1983, contracting for nonresidential building remained five percent below last year's same period.

Residential building contracts, totaling \$8.2 billion in May, showed a two percent advance from April's

MONTHLY SUMMARY OF CONSTRUCTION CONTRACT VALUE

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

	May 1983 Construction Contract Value (000,000)	Seasonally Adjusted Percent Change From Previous Month	
Nonresidential Building	\$ 5,245.7	+ 10	
Residential Building	8,235.2	+ 2	
Nonbuilding Construction	5,453.0	+ 31	
Total Construction	\$18,933.9	+ 15	
	5 Mos. 1983 (000,000)	5 Mos. 1982 (000,000)	Cumulative Percent Change
Nonresidential Building	\$23,578.8	\$24,809.7	- 5
Residential Building	33,683.4	20,352.9	+ 65
Nonbuilding Construction	16,690.9	15,959.0	+ 5
Total Construction	\$73,953.1	\$61,121.6	+ 21

DODGE INDEX

(1977 = 100, SEASONALLY ADJUSTED)

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May 1983	148

continued, page 10



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NATIONAL NEWS

continued from page 10

value, after seasonal adjustment.

"Recurring differences between F.W. Dodge and Commerce Department reports of housing activity in recent months," Christie explained, "are more a matter of *timing* than disparity in the volume of building. Both sources show a cumulative im-

provement so far in 1983 of roughly 70 percent over the same months of last year. Moreover, both sources report an average rate of housing starts of close to 1.6 million units during the past three months. But unlike the Commerce data, which indicate a volatile housing market in 1983, Dodge

statistics reveal a more stable rate of building."

Christie pointed out that the recent stability of Dodge data suggests that "the recovery of housing, which began last summer when mortgage rates broke, hasn't really progressed much in recent months now that rates have begun to level off."

At the end of five months, the value of all new construction started in 1983 was \$74 billion, a gain of 21 percent over the same months of 1982.

The accompanying chart is a summary of the latest month's Dodge construction statistics. 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. 23

P.R. Program and Medical Study Approved by ARMA Board

The Asphalt Roofing Manufacturers Association (ARMA) recently took action on several board agenda items.

The Board of Directors approved a major, five-year public relations and advertising program to promote the proven performance and profitability of built-up roofing systems.

Also approved was a medical study to develop data to respond to concerns that there may be some human health hazards associated with asphalt fumes.

In addition, the Board is voting by letter ballot on three other items raised at the director's meeting.

The items are: whether to proceed with an asphalt stabilizer research

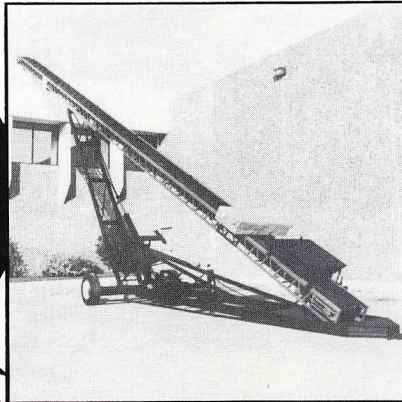
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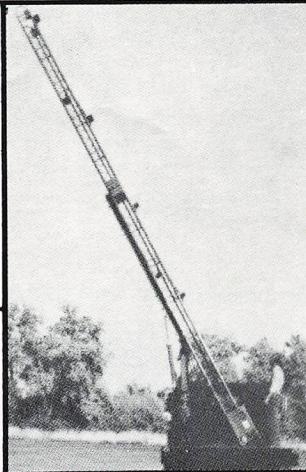
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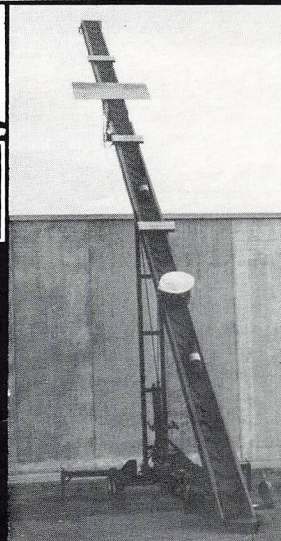
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project, whether to proceed with an extension of the present asphalt reserach program, and whether to change ARMA Bylaws to officially permit the addition of a vice president as another officer in the association.

ASA Elects 1983-84 Slate

Arthur C. Meushaw, president of Standard Acoustics, Inc., was installed as the 12th national president of the American Subcontractors Association (ASA) on July 1.

During his one-year term, Meushaw plans to emphasize expansion of the ASA government relations program, monitoring legislative and regulatory developments on

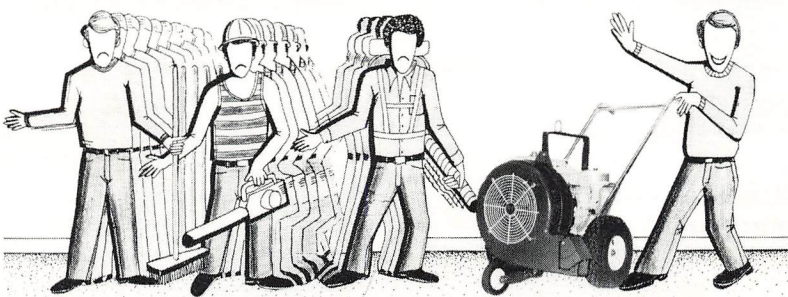
both the state and federal levels.

Also elected to ASA national office for 1983-84 are: First Vice President Eugene Grieve, Pittsburgh, Penn; Second Vice President A.E. Marchbanks, Houston, Tex; Third Vice President Robert Roberson, Raleigh, N.C. and Secretary/Treasurer Jesse Pickett, Latham N.Y.

ASA is a 5,000-member national trade association representing building, construction and subcontracting firms of all specialties. Founded in 1966, the group addresses problems such as contract payments that uniquely arise from subcontract arrangements.



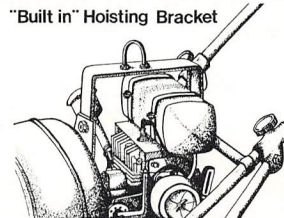
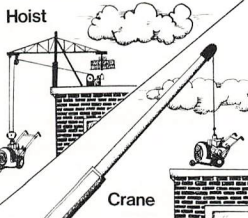
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Associate News

Construction Fasteners Mehigan Dies

Construction Fasteners, Inc. has regretfully announced the death of Dennis J. Mehigan, Manager of Dekfast Product Group.

Mehigan represented the firm in its sales activities in the United States and Canada for over 10 years. He was instrumental in the growth of threaded mechanical insulation fastening systems in the built-up and single-ply roofing industry.

Mehigan was a member of NRCA. He is survived by his wife, Jill, and their four children.

Norman Named Sales Manager at AEP/SPAN



Mike Norman has been named sales manager for the Architectural Products Division of AEP/SPAN, a subsidiary of Overhead Door Corp.

Norman will be responsible for advertising and internal sales and for developing and working with sales representatives.

Previously, Norman served as project manager and sales representative in Dallas and Houston for Inryco.

CPR/Upjohn Strengthens Management

Improved planning and faster response to changing market conditions and technology are the aims of new management assignments announced by R.V. Costello, vice president of the Chemical Division and director, CPR Division, The Upjohn Co.

A new Strategic Planning Group assumes responsibility for evaluating and coordinating activities related to overall business goals. Members of the group are: D.A. Belote, manager, Administrative Services; J.G. Fleck, General Sales Manager and R.G. Hayes, who is assigned to the new position of Group Manager, Technology and Business Development.

E.R. Cole was named manager, Plant Operations, with expanded responsibility for Materials Handling and Quality Control.

The CPR Division of The Upjohn Co. is a broad-range supplier of polyurethane and polyisocyanurate products including rigid and flexible foams, liquid chemical systems and engineering plastics.

Georgia-Pacific Expands in Virginia

Georgia-Pacific Corp. will construct an oriented strandboard (OSB) plant 10 miles south of its existing plywood plant in Emporia, Va.

The 300-acre site is located north of the Virginia-North Carolina state line. The new facility will permit the firm to increase its plywood production in Emporia and focus more on higher-margin specialty lines.

The new plant in Emporia is part of Georgia-Pacific's multi-year program to construct or expand 10 such buildings.

Grefco Assets Purchased by International Permalite

International Permalite, Inc., has purchased the assets of Grefco Building Products from its parent, General Refractories Co.

International Permalite Inc. will assume ownership of the former Grefco property including building and insulation manufacturing plants in Dayton, N.J.; Florence, Kentucky and Ontario, Calif.

Corporate headquarters will remain in Ontario. The national sales office will also remain in the same location as before, Oak Brook, Ill.

International Permalite will continue to manufacture perlite and urethane insulation products and to market the products under their existing trade names, including Permalite brand insulations.

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And there are other special advantages. The NRCA-sponsored program has a Safety Dividend program that could mean a savings when you improve safety and efficiency of your operation. Your participation in NRCA loss control activities could qualify you for a partial premium refund paid in the form of Safety Dividends. (Dividends are determined by the insurance company's Board of Directors and are not guaranteed.)

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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 test is necessarily generalized, and you are advised to consult with a professional legal advisor before taking any action.

Recent Developments in the Construction Industry

Failure to Give Notice of Defective Equipment Precludes Contractor's Recovery

A United States Circuit Court of Appeals ruled in a recent decision that a contractor who had bought defective construction equipment was not entitled to his \$1.5 million judgment because he had not properly notified the seller of the defects. *K & M Joint Venture v. Smith International, Inc.* 669 F.2d 1106 (6th Cir. 1982).

The contractor had purchased a 12-foot tunnel boring machine for use in constructing a sewer for the City of Cleveland. The machine was new but included several accessories which were used. The contractor and seller orally agreed to the sale, and the seller followed up with a written "quotation" and "invoice" which stated that "all equipment is offered in the 'as is' condition."

The \$75,000 boring machine turned out to be defective, malfunctioning repeatedly until it was removed for rebuilding. The contractor held a number of conversations with the seller concerning the problems. Finally, he brought suit against the seller for breach of contract. The contractor won a \$1.5 million judgment from the seller only to be reversed on appeal.

Two issues raised in this appeal are of particular importance to a contractor when he purchases material or equipment. Both concern the provisions of the Uniform Commercial Code, which governs the sale of goods in every state except Louisiana.

Section 2-607 of the UCC requires the buyer to give notice of any contended breach within a "reasonable time" after discovery. In a lawsuit for breach of warranty, the contractor will have the burden of proving that notice was given to the seller. The Court of Appeals ruled that the many communications between contractor and seller concerning the boring machine's problems did not constitute sufficient notice. The Court stated that the seller must be informed of the contractor's contention that the transaction involves a breach of warranty, and not merely that the transaction is "troublesome." It is

also noteworthy that the Court held the contractor to a higher standard of notice, since he was experienced in purchasing and operating this type of equipment.

Section 2-316 of the UCC allows the seller to escape liability for implied warranties by the use of expressions such as "as is" or "with all its faults." If such expressions are included in the documents evidencing the sale, they might prevent the contractor from relying on any representations made by the seller in a subsequent action for breach of warranty. In this respect, the contractor who bought the boring machine was fortunate - the Court ruled that under the circumstances of the sale, the parties only meant "as is" to refer to the used accessories.

In sum, a contractor should bear two things in mind when purchasing material or equipment: look over any documents, purchase orders or invoices to make sure that the seller has not used language that would allow him to disclaim responsibility for his own representations (such as "all equipment sold with all faults" or "there are not warranties which extend beyond the description"); and if the products turn out to be defective, notify the seller in writing as soon as possible that you consider the transaction to be in breach.

Retroactive Withdrawal Liability Declared Unconstitutional

The United States Court of Appeals for the Ninth Circuit has held that imposing withdrawal liability on employers who ceased contributions to multi-employer pension plans prior to September 26, 1980, the date the Multi-Employer Pension Plan Amendments Act was signed into law, violates the Fifth Amendment of the

continued on following page



continued

United States Constitution. *Shelter Framing Corporation v. Pension Benefit Guaranty Corporation*, No. 82-5271 (9th Cir. 5/26/83).

Withdrawal liability was created by the Multi-Employer Pension Plan Amendment Act of 1980, amending the Employee Retirement Income Security Act of 1974 ("ERISA"). In addition to creating withdrawal liability for employers who cease having an obligation to contribute to those multi-employer pension funds which have unfunded, vested benefits, the 1980 amendments imposed such liability on employers who withdrew after April 29, 1980, the effective date of the Act but before September 26, 1980, the date on which the Act was signed into law. By retroactively imposing withdrawal liability, the Multi-Employer Pension Plan Amendments Act saddled many employers with huge unanticipated liabilities.

The Ninth Circuit's ruling affirms the decisions of a federal district court in California in several cases involving contractors. Although numerous constitutional challenges have been filed throughout the country attacking both retroactive and non-retroactive withdrawal liability, only the California court had ruled in favor of

the challenges. Other federal district courts throughout the country had previously rejected constitutional challenges to the Multi-Employer Pension Plan Amendments Act. The Ninth Circuit's decision is the only such ruling by a federal court of appeals to date.

The Ninth Circuit reached its decision by balancing the benefits and protections which Congress intended to confer on multi-employer pension funds in passing the Act, against the interests and expectations of employers contributing to the funds. The Court found that the balance weighed in favor of the employers, since they had relied on earlier law (which did not include withdrawal liability) in making the decision to cease contributing to pension funds prior to the passage of the Act, since the previous regulations of multi-employer plans under ERISA did not anticipate the drastic changes in the regulatory scheme contained in the Multi-Employer Pension Plan Amendments Act; since there were no moderating provisions which tended to reduce the dramatic impact of withdrawal liability on an employer who had already withdrawn; and since the burdens imposed upon the employers by the sudden obligation to pay withdrawal liability were not justified by the very indirect benefits conferred upon employees by the new law. The Court found that the effective date of the act was "arbitrarily fixed" and required the employer to pay large, unanticipated and unplanned for liabilities without regard to a showing of proportionate need on the part of the pension trust funds.



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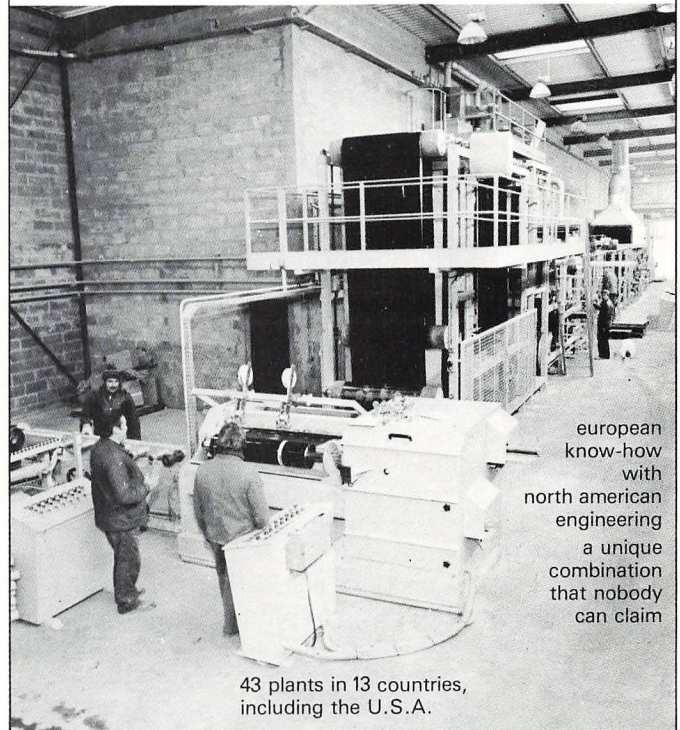
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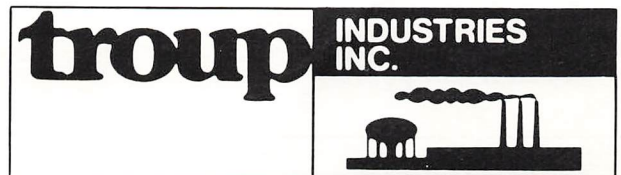
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Insulation Types

Keeping A Building Warm (and dry) With Insulation

by Martin Eastman

Heat travels, generally from where it is to where it's not wanted.

This is a simple fact of nature. There's no way to prevent it, no way to get around it. In fact, most of the cost of maintaining a comfortable temperature in a building is simply the cost of replacing heat that has escaped or removing heat that has crept through the building's envelope of protection.

Because the cost of heating or cooling a building has skyrocketed in recent years keeping heat where it belongs for as long as possible has become increasingly important.

In response, the manufacture of insulation has grown into a billion dollar industry. In 1981, insulation was a \$1.6 billion market. Some researchers predict this figure will quadruple by the end of the decade.

To tap into the lucrative insulation market manufacturers have developed many new materials with improved insulating properties. For roofs, nearly 200 manufacturers supply the five different generic types of board insulation most widely used.

None of these five types is an ideal choice for a roof, however. Each type has properties which make it suitable for one application and unsuitable for another.

Choosing the best insulation for a particular roof system involves sorting through the different types to find the one with the right combination of properties to fit your specific needs.

Some of the properties to consider

316

when examining roof insulations are:

- The thickness needed to achieve a desired R-value.
- The ability to resist damage from moisture.
- Its noncombustability; the ability to resist flame spread.
- Its physical and compressive strength; the ability to withstand weight loads and the stresses of application and building movement.
- Its dimensional stability; the ability to resist expansion or contraction with changes in temper-

Because the cost of heating or cooling a building has skyrocketed in recent years, keeping heat where it belongs for as long as possible has become increasingly important.

ature or moisture content.

- Its compatibility with other roofing materials.

The following insulations are reviewed with these properties in mind. Once again, don't look for the ideal insulation, it doesn't exist. Instead, look for the insulation that will work best on the particular roof you have in mind.

CELLULAR GLASS

Cellular glass, manufactured exclusively by Pittsburgh Corning Corp., is sold under the trade name Foamglas. It is made of closed glass cells containing an inert, insulating gas.

Compressive strength and resistance to moisture are cellular glass' major advantages. It is the strongest

of the insulating boards and it is unaffected by water, either as a gas or a liquid.

The Foamglas boards are fire resistant and dimensionally stable.

All deck types and roofing systems may be used with this insulation. It can be attached with asphalt or adhesives.

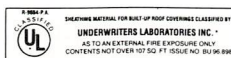
The biggest drawback to Foamglas is its relative inefficiency as an insulator. It may be necessary to use several inches of material to achieve the proper U-value for a roof system.

Foamglas is also too brittle to be mechanically attached and may be

continued on following page

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Insulation

continued

subject to damage from freeze-thaw cycles.

FIBROUS GLASS

Fibrous glass, or fiber glass, boards are made of compressed glass fibers mixed with a binder. This popular and versatile insulation is usually topped with a reinforced skin to provide a mopping surface for built-up systems.

It is compatible with all decks and roof systems and may be attached with asphalt, adhesives or mechanical fasteners.

Boards made from fibrous glass are resistant to fire and moisture. They are also quite dimensionally stable.

The insulating ability of fiber glass boards is greater than that of cellular glass or perlite, requiring less thickness for the same R-value.

The primary disadvantage of fiber glass insulation is its low compressive strength. Roof systems using fiber

the entire system.

Perlite boards are also moisture resistant and dimensionally stable in varying temperatures. They are compatible with all decks, roofing systems and methods of attachment.

In terms of compressive strength, perlite boards fall in the middle, being somewhat stronger than fiber glass and some of the less dense plastic boards but not as strong as cellular glass.

As an insulator perlite is not particularly efficient. Achieving a desired R-value with perlite boards will require a thicker layer than with any of the other boards reviewed.

EXPANDED POLYSTYRENE

Expanded polystyrene is one of the foamed plastic insulations noted for their high insulating ability. It is made by adding a blowing agent to polystyrene, a derivative of coke and crude oil. Cells of trapped gas develop during this process to give the boards their insulating property. If this gas escapes over time and is replaced by air, the insulating ability of the board may deteriorate slightly.

The high thermal resistance of expanded polystyrene makes it an excellent choice when a high U-value is required of a relatively thin roof system.

Polystyrene also resists moisture absorption. This property makes it possible to place the insulation boards over the waterproofing membrane rather than between the membrane and the deck. In this system, the insulation is actually protecting the membrane from temperature variations, mechanical damage and ultraviolet radiation.

Expanded polystyrene is not fire or heat resistant. This makes it unsuitable for use alone over steel decks or in hot built-up systems. It is also incompatible with solvent-based adhesives, has low compressive strength and expands and contracts with variations in temperature.

To overcome these problems the insulation is sometimes sandwiched in between other, more resistant materials such as fiberboard or perlite.

POLYURETHANE

Polyurethane is another foamed plastic insulation. It is formed from the combination of two chemicals. Mixing the two chemicals creates

Each type of insulation has properties which make it suitable for one application and unsuitable for another.


fluorocarbon vapor which is trapped in tiny cells as the material expands. As with polystyrene, the fluorocarbon may escape over time and the board will not insulate as well.

Polyurethane is the best insulator of the five reviewed. You would need 75 percent more glass fiber insulation, 150 percent more cellular glass and 175 percent more perlite to achieve the same R-value.

It is more resistant to heat and solvent adhesives than polystyrene, making it available for a wider variety of systems. There is some evidence, however, that directly applying built-up felts over polyurethane may cause blisters to form. For this reason, NRCA recommends a layer of fiberboard, perlite or fiber glass be attached to the insulation and the roof membrane be attached to the coverboard.

Polyurethane is also not fire resistant and may not be used directly over steel decks. Perlite, wood, fiber board, glass fiber or gypsum should be laid down first to provide a fire barrier between the deck and the insulation.

Polyurethane is also susceptible to moisture damage and is not dimensionally stable.

In the typical density used for roof insulation polyurethane also possesses low compressive strength. 

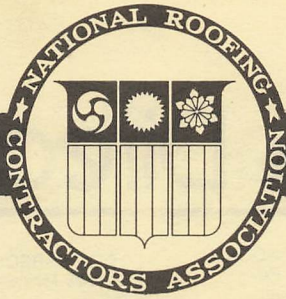
Don't look for the ideal insulation, it doesn't exist. Instead, look for the insulation that will work best on the particular roof you have in mind.

glass board insulation are susceptible to damage from traffic and concentrated weight loads.

PERLITIC

Perlitic insulation boards are almost as popular as fiber glass for use on the roof. They are made from expanded perlite, a volcanic inorganic mineral mined from the earth.

The advantage of perlite is its resistance to fire. When used with plastic insulations, which burn easily, it increases the fire resistance of



Memo To NRCA Members

From the NRCA Executive Committee

Promoting the NRCA contractor's professionalism, expertise and knowledge is the thrust of the recently announced NRCA Centennial Fund Program.

Unfortunately, we're having trouble making that fact known. As things now stand, some NRCA members are confused. We'd like to clear the air, about what is planned regarding the exciting "Professional Roofing Contractor" program.

- Over 80 percent of the money collected through the NRCA Centennial Fund will be used for a massive public relations and advertising campaign. Our goal is to tell the consumer and specifier that the professional NRCA roofing contractor is a knowledgeable, highly competent specialist and the best source for the all-important roofing system.
- The "Professional Roofing Contractor" program is needed NOW. It is critical that we go out and aggressively fight for our business.

- The campaign is planned to start with the 1984 convention. It will, naturally, tie in with our Centennial at the appropriate time but promoting "The Professional Roofing Contractor" will start now.
- A small share of the generated funds (no more than 20 percent) will be allocated for the NRCA Centennial celebration. The industry's leading trade association is 100 years old, and proud of it. All of the planned Centennial celebration activities will generate more pride and enthusiasm for our industry and our association.

If you have further questions, please feel free to contact the NRCA staff in Chicago at 312/693-0700, or call any member of the NRCA Executive Committee.

The success of the "Professional Roofing Contractor" program rests with you, the member. This is your opportunity to make your professionalism known.



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Coming Events

September 30 - October 1

Arizona Roofing Contractors Association
Annual Conference
Nagales, Ariz.

October 7-14

National Lumber & Building Materials Dealers Association
Annual Convention
Phoenix, Ariz.

October 10-14

American Society for Testing Materials (ASTM)
Committee C-16 Meeting
San Antonio, Tex.

October 17-20

American Society for Testing Materials (ASTM)
Committee E-6 Meeting
Bal Harbour, Fla.

October 18-21

Roofing Industry Educational Institute (RIEI)
Four-Day Roofing Technology Seminar on Membrane Roofing Systems
Cherry Hill, N.J.

October 18-23

Capital District S/M Roofing & A/C Association, Inc.
Mid-year Meeting
Hilton Head, S.C.

October 20

University of Lowell,
Department of Continuing Education
Roofing and Roof Maintenance
Lowell, Mass.

October 21

Roofing Industry Educational Institute (RIEI) and Construction Specifications Institute (CSI)
Design & Specifications
Washington, D.C.

(For inclusion of events, address all correspondence to:
Roofing Spec "Coming Events,"
8600 W. Bryn Mawr Ave., Chicago, Ill. 60631.)

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Harrison Honored with Carolinas' Award

Robert T. Harrison of Greenville Roofing Co., Greenville, S.C. was selected the 1983 recipient of the Gordon M. Waters Distinguished Service Award, presented by the Carolinas Roofing and Sheet Metal Contractors Association, Inc.

The honor is bestowed upon an outstanding individual who contributed greatly to the roofing and sheet metal industry.

Harrison is one of three vice presidents of the National Roofing Contractors Association (NRCA). He is presently the vice president liaison for three committees: the Educational Operating Committee, Accredited Roofing Contractor Over-

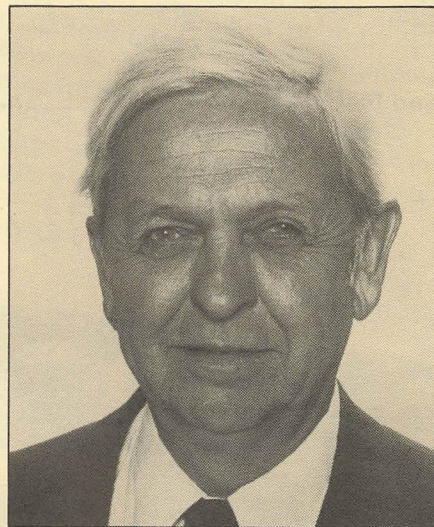
sight Committee and the Worker Training Committee.

The award recipient is a past president of the Carolinas Association and is a member of The Construction Specifications Institute and Associated General Contractors.

Harrison is also active in civic concerns including the Kiwanis Club (past president) and the Chamber of Commerce for Greenville.

The prestigious award is named after Gordon M. Waters, the Carolinas' charter president (1943).

Waters, still active in the roofing business, is a past president of NRCA (1949) and recipient of NRCA's J.A. Piper Award for 1957.



Powerful Partnership Offered by NRCA

By joining NRCA, a roofing contractor makes a powerful partnership with an association dedicated to strengthening the roofing industry.

In order to keep that powerful current flowing, the Association asks its members to become actively involved in the recruitment of other contractors.

Not only do recruiters feel the pride which comes with supporting the NRCA, but many tangible benefits ensue as well.

Each individual who recruits five new members is inducted into the 2000 CLUB as a lifetime member. The 2000 CLUB was established in 1978 in order to recognize outstanding recruiters.

A 2000 CLUB pin and a 2000 CLUB suede jacket are presented to each

qualified recruiter. For every additional five members recruited, she/he receives a diamond to fill the zeroes in the 2000 figure.

In addition, the Charlie Raymond Award is presented at the Awards Luncheon at the Annual NRCA Convention & Exhibit. The award is bestowed upon the individual who recruited the most new members for one year. Richard Rosenow of Hans Rosenow Roofing Co., Chicago, Ill., was the 1982-83 recipient, with 23 new members.

The best opportunity to become a member of the 2000 CLUB or a Charlie Raymond Award winner is by participating in one of four NRCA Phone Days.

Recruiters spend the day at NRCA headquarters phoning prospective members and winning caps,

plaques, decanters and much more for their efforts. At the end of the day when the tallies are in, the top "sellers" are determined and qualify for larger prizes and the prestigious awards.

Bennett Hutchison III of Tip Top Roofers, Atlanta, Ga., will be coordinating this year's phone days. Although a rookie, Hutchison came in third for the Charlie Raymond Award on the heels of two veteran recruiters, Rick Rosenow and John Carruth, Jr. of Carruth Roofing Co., Inc., Miami, Fla.

If you are interested in joining the membership recruitment team for one, two, three or all four Phone Days, contact Anna Leonhardt at NRCA, 312/693-0700.



Now available from NRCA is a worker training program — **Kettles, Tankers and Bitumen Heating**. This four-part audiovisual program covers everything workers need to know for correct bitumen heating and operation and maintenance of heating equipment.

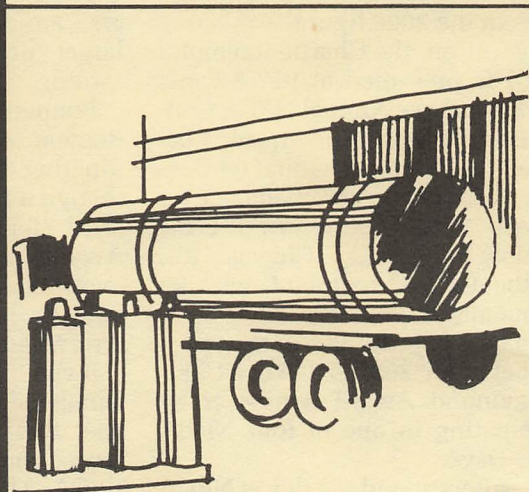
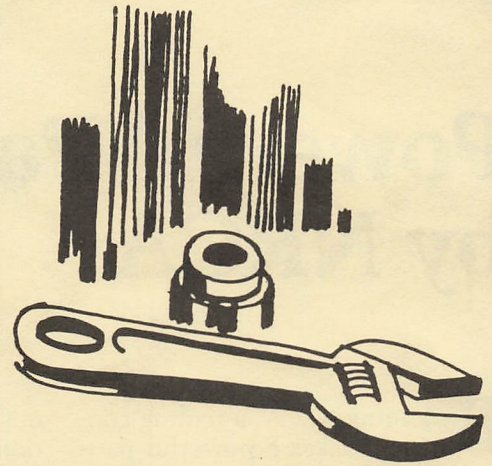
The program, with over 300 slides and a 40-minute soundtrack, depicts the correct procedures for kettle set-up and loading, safety considerations, thawing lines in cold weather, pump operation, the importance of preventive maintenance, and much, much more.

In addition, a comprehensive workbook contains a complete outline of the program with quizzes and tests to gauge worker knowledge.

The program can be used for earning field worker credit in NRCA's Accredited Roofing Contractor program, good for up to five-hours credit.

For more information on **Kettles, Tankers and Bitumen Heating**, contact Alan Grayson, NRCA Director of Education, 8600 Bryn Mawr Ave., Chicago, Ill. 60631.

Kettles, Tankers, and Bitumen Heating



The Causes of Wind Uplift

excerpted from *The Kelly Report*®
by Thomas L. Kelly
Kelly Energy Systems, Inc.

What causes roofs to blow off? Understanding wind uplift effects on roofs of buildings is a good place to start.

Wind uplift problems on roofs are caused by negative air pressures. These negative air pressures are caused by an inter-action between the particular shape of a building and the wind flow into and across the building. This inter-action between wind and building sometimes causes a wind vortex to enact minus air suction pressure, causing the roof membrane to be torn off the structure.

A vortex is a small tornado, an eddy or intense spiral motion in a limited region, mass of fluid or gas, with a whirling or circular motion that tends to form a cavity or vacuum in the center.

When this wave-like suction of air passes a roof, it causes negative air pressure on it.

An easy way to understand how a vortex creates negative pressure is through a childhood science experiment of blowing across a piece of paper. The paper rises up due to the suction of the negative pressure on top of the sheet because the blown air is less dense than the atmospheric air. This difference in pressure causes the strip to lift.

A more sophisticated understanding of wind vortex and negative pressure is to be found in learning how an airplane flies.

The air is forced to be split by the wedge effect of a wing. The air across the top of the wing is made to go faster because it has a longer distance to travel to catch up with air that was split on the bottom part of the wing. The physics equation of this suction of air is explained in the Bernulli Principle, ($P_t = P_s + \frac{1}{2} PV^2$).

Although a roof is not exactly the same shape as an airplane wing, similar wind uplift effects take place with negative suction pressures just like an airplane's wing. These negative suctions take place due to wind updrafts on the side of a building creating negative pressures through wind vortices. These vortices are concentrated along the perimeter edges of buildings, especially in outside corners.

These wind uplift forces do not physically blow the roof membrane away or off. They, in actuality, suck the roofing membrane off the structure.

To learn more about what occurs, a group of building models were installed in the Massachusetts Institute of Technology (M.I.T.) Wright Brothers Wind Tunnel, with a smoke source to depict the actual size and shape of the building.

Upon investigation we discovered the most damaging

wind uplift effects occur on the outside corners of a building when hit by a wind directly on a 45 degree angle. A unique wind phenomenon takes place creating a compound horizontal laying down vortex or "double tornado effect" with funnel intensities strongest in the periphery of a building's outside corner.

This is the most damaging wind uplift effect area on a building. Ninety percent of all roof blowoffs occur because of this compound tornado effect on the corners of buildings. Outside corners are the most crucial area to be fastened or air sealed along the perimeter, to guard against these wind uplift effects compounding on the outside corners of buildings.

Depending upon the particular shape and height of the building, variations in wind uplift pressures take place (similar to the extension of the flap of an airplane wing).

In buildings with protruding soffits and overhangs and with parapet walls under two feet we learned that very tall buildings, because of the increased intensity of air

A sophisticated understanding of wind vortex can be obtained by studying an airplane wing.

up the side of the building, extend the wind vortex wave. The intensified area of the negative uplift pressures along the perimeter edge of the roof are extended inward. Instead of being concentrated three feet in from the perimeter, they are six to eight feet in.

Parapet walls over two feet in height extend the wind vortex to the height of the parapet wall. To get any nullifying effects of the wind uplift, the parapet wall must be over two feet high. This extension of the parapet wall does not nullify all wind uplift effects, it simply lessens the extreme pressures experienced at the roof level.

To fully protect a parapet wall from wind and water, the total parapet should be waterproofed with the roof membrane and 100 percent adhered to the wall and the cap. Wall flashings should hang loose, for they will become fatigued by the pulsating action of the wind.

Why does a roof blow up when a negative air force oc-

continued on following page

Wind Uplift

continued

curs above its surface? Basically, for three reasons:

Atmospheric air under the roof membrane is expanding to equalize to the negative pressure above the roof membrane.

Air infiltrates into the underside of the roof membrane from sloppy edge details.

Air infiltrates into the underside of the roof membrane from a non-air sealed deck, therefore causing an equalization of the air in the total building to be absorbed in the roof membrane and causing it to blow apart.

Two of the testing facilities serving the roofing industry are Factory Mutual (FM) and Underwriters Laboratories (UL). Both take a roof deck assembly and place it into their respectively devised pressure chambers. I'm not sure either testing chamber comes near enough to achieving the actual suction that takes place in wind uplift.

FM and UL do have the capability of exerting positive pressure (+ 90 PSF and greater) from beneath the roofing membrane, not the - 90 PSF which occurs above the roof in actual conditions.

(I feel that exerting pressures under the roof assembly is adequate for BUR and other rigid membranes, either mechanically fastened or fastened by means of adhesives in a total rigid construction.)

Neither of these two tests actually simulates what is happening on the roof, but rather these roof assembly pressure tests inact the air expansion taking place under a roof membrane when a negative uplift is present above the roof membrane. I believe this is an appropriate test for embrittlement of a roofing membrane, especially a standard built-up roof membrane.

Air expansion under flexible single-ply membranes disperse expanding air wind uplift pressures over the total roof surface to give reduced wind uplift pressures concentrated on perimeters.

A single-ply membrane partially adhered to the local perimeter, however, can balloon where wind uplift forces cause an expansion of air under the roof membrane. Because the single-ply membrane can lift, the intense perimeter air expansion can be shifted back into the roof body from the perimeter thus dispersing wind uplift pressure load over the entire roof. Ten pound PSF loose

“To fully protect a parapet wall from wind and water, the total parapet should be waterproofed.”

laid and ballasted systems work the same way; they distribute the air expansion wind uplift pressure over the entire roof. They give an average load over the entire structure, not an intense local perimeter pressure.

Loose-laid and ballasted roofs are also held down because the stones used as ballast create a rough roof surface suction breaker causing air to flow in a rolling fashion over the rough ballast stones: the effect is similar to a suction cup on a rough surface.

A loose-laid membrane can be blown off from air infiltration under the roof membrane and from air leaks along the perimeter edge of a building. Air can infiltrate through the roof deck from inside the structure in a couple of different ways:

If the roof is not self sealed.

When only a simple gravel stop cover is used, allowing air to infiltrate into the insulation and roof membrane. (Air can infiltrate under the gravel stop face and under the roof sheet membrane, causing ballooning and shifting of gravel in uplift suction. It's important that all seals are air tight.)

Another area of caution regarding installations of single-ply membranes concerns moisture venting. I feel that all vents used should have one-way valves.

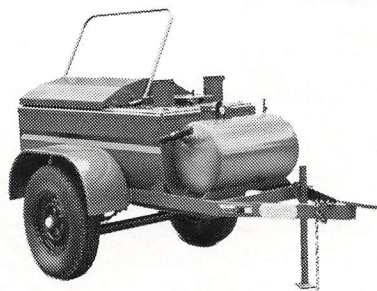
Finally, in understanding wind uplift negative or minus air pressures, it must be considered that their intensity is due to two things: the shape and height of a building, and the velocity of the blowing wind.

In addition, I've found there is an astonishing energy loss through non-hermetically sealed edge details on standard commercial buildings. If the face edging of the upper perimeter of the building is not correctly sealed, tremendous drafts can be created robbing a structure of its heat and/or air conditioning.

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Project Pinpoint: The Roofing Industry's Early Warning System

by Martin Eastman

Project Pinpoint provides a graphic picture of an industry searching for quality materials and solutions to problems.

Like a blue-chip investment, NRCA's Project Pinpoint has slowly and steadily increased in value with each passing year.

Since 1974, Pinpoint has collected and analyzed an ever-growing pool of job information. Now, with statistics on over 2500 roofs packed in its data banks, NRCA generates some very informative numbers.

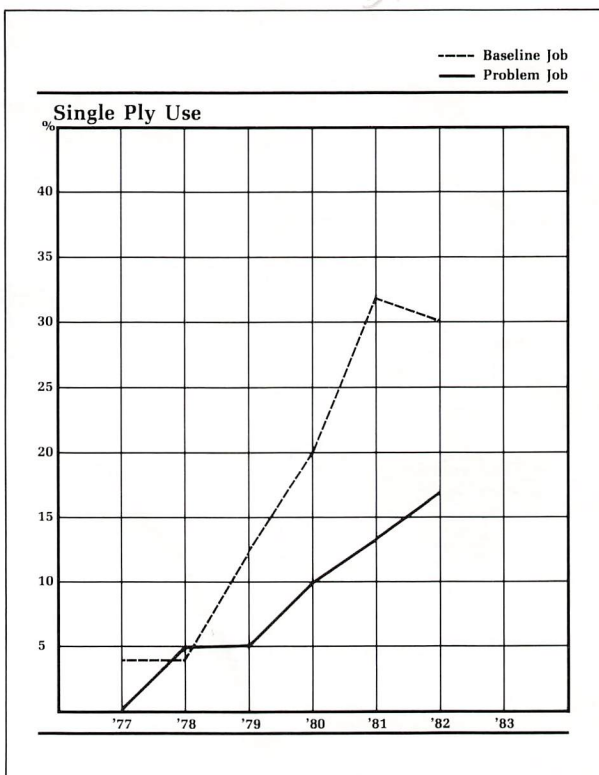
The concept behind Project Pinpoint (PP) is really quite simple: Accumulate enough information on enough jobs, especially problem jobs, and statistically significant patterns and correlations will emerge between roofing practices, materials and problems.

For example, the 1979 Pinpoint statistics showed 38 percent of the problem roofs reported that year used polyurethane or polystyrene insulation. This figure correlated with a trend observed in other years toward increasing problems with plastic insulation used in built-up systems. The statistically significant correlation became one of the early warning signals which led the industry to examine the situation more closely.

To discover the correlations between roof problems and plastic insulation, analysts examined two pools of data collected by PP, baseline data and problem job data.

The baseline data pool holds a random sampling of jobs completed by NRCA members. By itself, the pool can show which materials and practices are becoming popular and which are being used less frequently. As an example, the statistics from 1977 to 1982 chart the dramatic rise in the use of single-ply membranes, from virtually nil to a 30 percent share of the roofs being put down.

Accumulated in the other pool is information on problem jobs NRCA members encounter. This pool charts the frequency which blisters, fish-mouths and other roof



problems occur in various roof systems.

Comparing the two pools can help to pinpoint the systems and materials which seem to be causing the most problems. If a particular item shows up in greater percentages in problem jobs than in baseline jobs, that item may be flagged as potentially risky.

But a word of warning is in order. Problem data does not necessarily reflect current roofing practice. The average problem roof is between five and 10 years old. This time lag means that today's problems are appearing on yesterday's roofs.

Because of this, focusing on one year's percentages may give a lopsided picture of problems occurring with a particular roofing material or system.

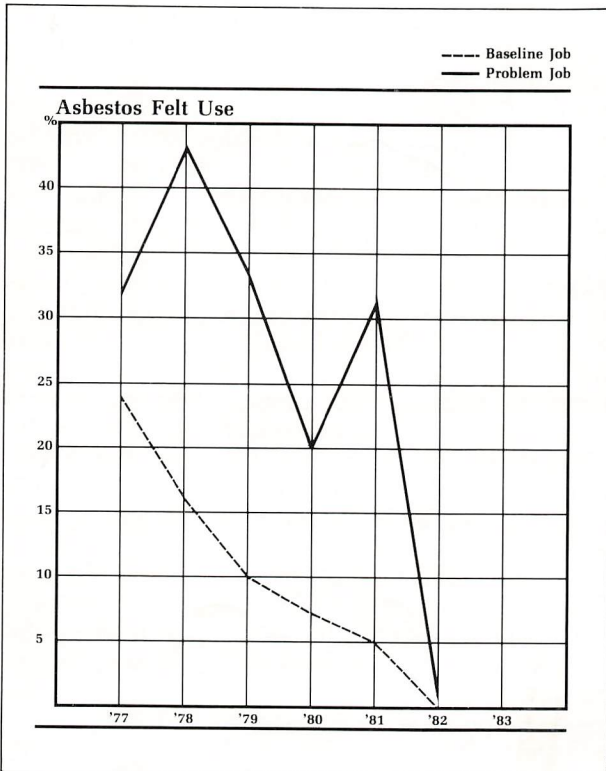
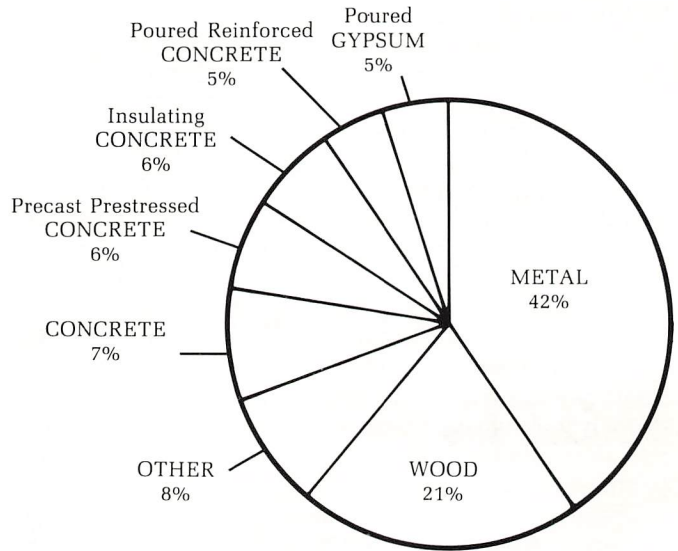
Comparing trends occurring over several years, on the other hand, provides a more balanced perspective. Using PP data, it is possible to follow trends over a nine year period. During this time, several major trends in roofing practice have occurred and have been reflected in PP statistics.

Three of these trends, the use of asbestos felts, two-ply systems and the use of hot asphalt between the insulation and the deck, have erupted as major issues in recent years. Charting these three trends using PP statistics provides a graphic picture of an industry searching for quality materials and solutions to problems.

The failure of two-ply systems was one of the first trends to stand out in PP statistics. In 1975, one year after Project Pinpoint was initiated, two-ply systems showed up on twice as many problem jobs as baseline jobs. Since then, the number of two-ply systems involved in problem jobs has averaged 23 points more than the number of

continued on following page

Deck Type



Figures for 1977 to 1982 chart the dramatic rise in the use of single-ply membranes, from virtually nil to a 30-percent share.

Project Pinpoint

continued

two-ply systems used in baseline jobs.

The baseline data for this period traces the roofing industry's reaction to the two-ply failures. According to 1975 statistics, over 25 percent of the roofs installed used two plys. By 1982, that number had dwindled to only four percent of the total.

The other two trends followed similar patterns. A high incidence of roof failures seemed to indicate a problem with asbestos felts. A separate survey in 1980 confirmed the tendency for asbestos roofs to split and fail.

At about this time, the use of asbestos felts was linked to cancer and its popularity as roofing material declined rapidly. By 1982, the use of asbestos, once the second most popular membrane, plummeted to a mere two percent of the baseline data reported.

The use of hot asphalt to adhere insulation to the deck has become more of a problem in recent years, according to PP data. At the same time, the practice has slowly but steadily declined. That decline should become a steep drop in coming years because of Factory Mutual's policy that all insulation over metal decks must be mechanically attached.

These statistics, as well as others, gain statistical weight with each year's batch of numbers. Jagged, saw-toothed graphs are evened out as the new statistics are plotted on them.

The statistics gathered in 1982 added 431 jobs to the baseline data pool and 214 to the problem job pool.

There were no real surprises in the 1982 statistics. Most trends continued as expected. Metal decks and flat

roofs remained the most popular choices for their respective categories. Metal decks still account for almost half the baseline jobs reported (45.5 percent). And about 80 percent of the baseline roofs are still being built with a slope no greater than one-quarter inch.

One interesting shift in the types of problems being reported. Blisters and splits have traditionally dominated this category in previous years. This year, however, the "other" choice accounts for more responses than blisters and splits combined. (More analysis is needed to determine what kinds of problems are being designated as "other" on the survey form.)

Project Pinpoint statistics also reflect the weak economy. The percentage of new construction took a nosedive, accounting for only 35 percent of the baseline jobs completed in 1982.

Statistical trends for the use of asbestos felts, two-ply systems and the use of hot asphalt between the insulation and deck red-flagged the industry to potential problems.

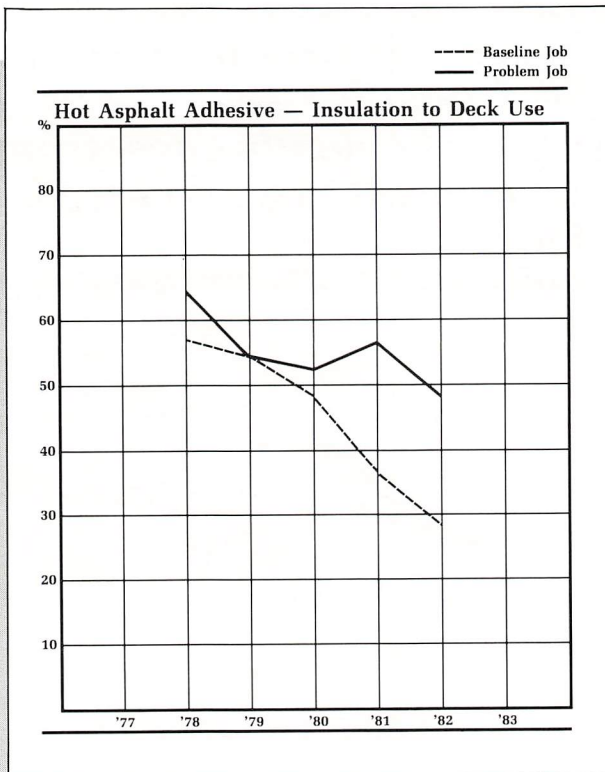
Some roofing trends, hinted at in the 1982 numbers, will become more significant in coming years. The failure rate of single-ply systems has grown steadily with their increasing use. More and more roofers will be watching this statistic in the future as older systems begin to age and weather. Should the failure rate for a particular system increase a great deal more than the baseline rate it may indicate an unreliable system.

Whatever future PP statistics reveal one thing is certain; each year, as more numbers are plugged into the Project's equations, the results become more valid and useful.

By reporting baseline and problem jobs, contractors give the technical and research committees at NRCA the tools they need to discover the problems facing the roofing industry. Problems pinpointed by PP may become the subject of alert bulletins and point the way for continued research.

NRCA contractor members with problem jobs may also use the Project's files to find out how others have dealt with the problem in the past. Upon request, the names of other NRCA members with similar problems can be supplied.

Project Pinpoint is an investment NRCA members have made in the future of the roofing industry. But, unlike other investments, it is one the industry can cash in on as it continues to grow.



Energy and the Roof

For repairs, the need for thermal insulation in commercial or industrial structures has, for years, been taken for granted. In some cases, insulation has been largely ignored or intentionally bypassed with an eye to keeping initial building costs low.

With energy in short supply and with energy costs continuing to escalate, the days when building design can be dictated by front end cost considerations alone are gone forever.

Self-imposed fuel conservation measures, fuel allocation and "energy budgets" have necessitated a shift in design criteria. Building designers and owners are looking beyond the initial cost of erecting a building to "life-cycle" costing. That is, they are taking into account not only the initial cost but the total cost of the building over the projected life of the facility.

In view of the energy crisis, this "life-cycle" costing must certainly take into account the anticipated cost of heating and cooling over the projected building life as a factor to be balanced against initial cost. From this viewpoint, the higher construction costs involved in making a thermally efficient structure may still result in net savings due to decreased fuel requirements for heating and cooling over the anticipated life-span of the building.

Life-cycle costing is extremely complex. If an owner is concerned with questions of capital investment, tax law and other such financial management decision making, he will need expert counsel in these areas. If the owner is concerned with total building energy considerations including such things as size of mechanical equipment, wall performance, types of fuel and design considerations, he will need expert counsel in these areas. The NRCA Energy Manual deals with roof energy efficiency only. This manual will familiarize you with the terms - the considerations - and the calculations concerning roofing and energy efficiency. Even the roofing portion of the subject area is complex and as you become more familiar with the subject you will, in fact, become more aware of the number of assumptions and estimates that are commonly used in making roofing energy calculations.

This is not to say that assumptions and estimates should not be used. The data you are given is the best available. You will find that all energy calculations of this type are made on similar assumptions or estimates. You, the roofing contractor, should be aware and fully realize that you cannot warranty specific savings nor make specific energy savings commitments. The manual deals with "average conditions" based on predetermined assumptions.

In commercial/industrial buildings the roof represents a substantial barrier between inside and outside and is most important in energy design. As a result, there will be increasing emphasis in federal, state and local codes and specifications which call for more insulation to improve the effectiveness of the roof energy barrier. Even where no code or specification is involved, the situation is such that individual owners and architects are increasingly conscious of the economic advantages of energy conservation.

Again, be aware that this entire field is not based on rigid fact, but on the best available estimates. No two buildings are alike and any calculation made regarding energy is necessarily approximate. Many variables are involved in any building - to name a few:

- Hours of use of the building.
- Internal heat gains due to the use of lighting or mechanical equipment.
- Actual daily heat cycle.
- Thermostat settings and sensitivity.
- Number and location of skylights.
- Quantity and location of rooftop equipment.
- Nature of building occupancy.

The results obtained by using this manual are true and accurate within the limits stated. More detailed and complex calculations will refine the end result, but be aware that increasing refinement results in smaller and smaller changes in the end result.

One area in which it is certainly possible to realize full advantage of increasingly critical energy design criteria is in the field of roof systems.

Every building consists of a series of surfaces which separate the "inside" from the "outside." A building is designed to use these surfaces to create a comfortable environment "inside" despite the anticipated weather variations "outside." This has always been true. The effect of the energy crisis has been to create a need for measuring the cost-effectiveness of separating the "inside" and the "outside" at various levels of efficiency.

What is not generally realized, even in the construction industry, is the fact that the roof constitutes a major portion of the surface which does separate "inside" from "outside," particularly in the case of industrial / commercial buildings. (As an example, a reasonable 100 × 150 ft. building, 10 ft. high, has only 2 × (100 + 150) × 10 = 5,000 sq. ft. of wall area, while the roof 100 × 150 = 15,000 sq. ft. has three times as much surface, or ¾ of the inside-outside separation area.) Clearly, the roof area represents an obvious opportunity for energy savings by way of increased insulation. This is especially true for buildings having a high roof-to-wall area ratio.

The importance of the roof system as a factor in creating thermally efficient buildings offers a challenge for every roofing contractor to inform building owners and architects of the importance of total roof design to maximize energy savings. This is a matter of concern for every NRCA member.

At the same time, several points should be made clear: When roofing system requirements are changed, they may necessitate changing roof construction methods.

continued on following page

Energy

continued

Lower "U" values tend to isolate the roofing membrane from the building interior. The roofing membrane must more independently withstand the stresses of alternate thermal cycles. Design considerations should include:

- Supplemental mechanical attachment of the roof insulation to the deck;
- Closer spacing of expansion joints;
- Evaluation of roofing membrane performance criteria;
- Reflective surfaces or light colored gravel.

In addition, a planned roof maintenance program is critical.

In the succeeding sections of this manual, a number of problems are explored dealing with the calculation of the thermal resistance of a given design, or the design factors necessary to achieve a given thermal resistance. In any case, a roofing contractor would be well advised to:

- Disclaim responsibility for published "k" and/or "C" values as these values may vary in actual use and depending on test criteria used by the manufacturer.
- Encourage better thermal efficiency and total

26

roofing system performance improvements without the introduction of "alien" materials into proven systems.

Take into account the fact that added thermally efficient insulation will slow the melting of snow in cold climates. Therefore, snow loads to the structure should be considered when recommending added insulation.

General Energy Properties of Roof Insulation Systems

The purpose of this document is to list those properties of roof components which are important in the energy-conservation area, to define and illustrate the factors which are used in energy calculation and to provide every NRCA member with sufficient background and basic information necessary to deal with energy problems and to understand the fundamental theory and terminology used in the energy field.

Multiple Layer Insulation Applications: Laboratory studies indicate that the thermal efficiency of single layer insulation systems may be reduced by as much as 10 percent due to heat loss at insulation joint gaps in excess of 3/16". By installing insulation materials in two layers and staggering the joints of the top insulation layer from the joints of the bottom insulation layer, the loss of thermal efficiency can be reduced to "nil" by all test standards. Some insulating efficiency will be lost because of absorption of adhesive bitumen by the insulation boards or by minor "breaking down" of cells of plastic foam-type insulating materials during application of the interlayer adhesive bitumen. For the most part, this loss of insulating efficiency is negligible.

Installation of insulation boards in two layers minimizes or eliminates conduction of heat/cold through mechanical fasteners used to secure insulation boards to steel decks.

In addition to contributing to the overall insulating efficiency of the roofing assembly, installation of insulation boards in two layers usually results in less stress on the roofing membrane, especially over steel decks during the time of construction. The possibility of having joints of insulation boards coinciding with sidelaps of steel decking is eliminated, as is the possibility of cantilevering of insulation boards over steel deck flute openings.

Tapered Insulation Systems: In most instances, tapered insulation systems are used to provide slope-to-drainage to otherwise flat or concave roof surfaces. Complex roof areas will require complex installation of tapered insulation boards. Consideration must be given to clearance at perimeters and at penetrations since in most cases the roof surface will be raised by several inches at ridges in the insulation assembly. Crickets and saddles are a form of tapered insulation assemblies used to divert water to interior drains in valleys or to scupper openings through perimeter curbs or walls. These systems facilitate drainage, and in some instances their qualities as "insulation" may be considered secondary to the drainage function. Raising perimeter and/or penetration curbs to accommodate a tapered insulation assembly may be much more costly than the installation of a few strategically located additional drains to provide for elimination of ponding conditions.



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Computers On The Roof

by Connie Arkus

Instead of carrying a pad of paper and pen to the job site, Larry Carlson of Carlson Roofing Co., Inc., Rockford, Ill., brings his three-and-a-half pound computer.

Carlson uses his "portable notebook" for estimating, scheduling and word processing. The Radio Shack TRS-80, Model 100, is powered by four penlight batteries and a built-in rechargeable battery.

The Model 100 has 24K of user memory, 32K of machine memory and easily slips into Carlson's canvas briefcase.

Computers are not the wave of the future — they're here now. And, as demonstrated by Carlson, computers can be adapted to the needs of roofing contractors in their daily operations and taken nearly everywhere.

The National Roofing Contractors Association (NRCA) recently surveyed its members to find out if computers have reached their businesses — 241 responded.

Fifty-three percent of the contractors that returned the surveys use computers in their businesses. An additional 25 percent plan on purchasing some type of computer within the next 12 months, while 22 percent do not use computers and do not plan on purchasing one within the next year.

Highlights of the survey can be found in this article. All NRCA members will receive statistical breakdowns.

Which computer is most popular among NRCA contractors? International Business Machines (IBM) netted 23.6 percent of the vote. The Radio Shack TRS series came in second with 13 percent. Tied for third were Basic Four and Texas Instruments, each with six percent.

An overwhelming majority of computer users purchased their equipment new, 82.6 percent, instead of leasing or renting the machines.

BASIC was the top software choice, with 60 percent of the vote and COBOL with 16.6 percent.

Fifty-one percent of the respondents plan to purchase more software but 48.9 percent do not. Of

those who plan to buy additional programs, 75 percent want more BASIC.

A variety of peripheral equipment can be attached to the machine. Almost everyone who answered the questionnaire has a printer, 98 percent, 73 percent have a terminal, 55 percent have floppy disk and 41 percent have hard disk.

Sixty-five percent do not plan on adding any more equipment and 42 percent will. Of those who plan to purchase additional pieces, 27 percent want terminals, 24 percent want hard disk and 20 percent would like printers.

How many employees are actually using computers in the office? Twenty-seven percent of the firms that responded indicated that two employees use the computers; 24 percent said that three do and 18 percent said that four employees operate the equipment.

Employees were trained by various methods, and in many cases, a combination of educational resources were utilized.

Fifty-three percent learned the operational procedures in-house or through self-instruction with a computer manual.

The additional 31 percent learned how to use the computer through classes or instruction provided by the company that sold equipment.

Over 88 percent of the respondents reported that their computers were living up to their expectations. Eleven percent said, "no."

Fifty-two percent said that there were drawbacks to the systems they were using, while 30 percent were satisfied.

"Lack of suitable software" was the most common lament of those who were not satisfied, 26.3 percent. "Insufficient memory" and "insufficient speed" each received 19.2 percent of the dissatisfaction level. "Time consuming to operate correctly" and "not flexible" were reported, each with seven percent.

The computer is saving 71.6 percent of the firms money, with 14.9 percent responding that money is not being saved and 9.4 percent ex-

plaining that, currently, no money is being saved, but in the future it will be.

Comments made by those who answered "yes" to savings include: "Reduces time; better control of job costs; less mistakes, and don't have to hire additional staff."

Those who answered "no" said that software was a problem. One respondent spoke for many when he said, "Considering the cost of the equipment and software, it will take several more years to realize savings."

Eighty-seven percent said that the computer is saving staff time in the office, and only 7.8 percent said it is not.

The majority of respondents did not use the services of a consultant when selecting a computer system for their company, 62.9 percent, and 37.7 percent did.

Those who did hire a consultant received advice on custom programming, 27.8 percent; training, 18.2 percent; software, 16.5 percent and needs assessment, 12.1 percent.

Eighty-seven percent would recommend their system. "Limited flexibility, small memory and inadequate software" prompted 8.6 percent not to recommend their systems.

What functions do the companies use a computer for? Almost anything and everything can be achieved with the equipment. Some of the more popular uses are: payroll, 82.6 percent; accounts receivable, 79.5 percent; accounts payable, 79.5 percent; general ledger, 78.7 percent; financial reporting, 74.0 percent and cost allocation, 56.6 percent.

Many contractors penciled in comments reflecting their personal experiences with computers.

Strong advice concerning software was offered by NRCA members to potential computer purchasers. Many used special programming services in order to have software designed specifically to their needs.

"The roofing industry needs its own software," said a spokesperson for McGonigle & Hilger Roofing Co., Inc., Lockport, N.Y.

A Pennsylvania company said, "Due to the complex nature of our business, we found it necessary to have a program tailored to fit our needs."

Another Pennsylvania company stressed the value of good programming and a reputable computer firm.

"Software is the most important part of the system. Always be sure that the sales personnel know what they are talking about."

After the correct software is obtained and once the programmer is familiar with the computer's capabilities, however, the sky's the limit for programming possibilities.

Thomas R. Rose, Rose Roofing Co., Arlington, Va., has written about 75 programs for his IBM System 34 purchased last year.

"One of the programs which I feel has done the best is a series that sorts through our roofing jobs and compiles them by operation, type of roof, insulation, type of roof system and surface," he said.

Rose uses this information to check on the performance of roofs his company installed.

He also devised another system, one to track estimates. "One of the nicest features about the estimate system is that one of the reports is the actual program," Rose said.

"This report is fed into our copier and is copied onto our proposal form — this saves someone from having to type the estimate."

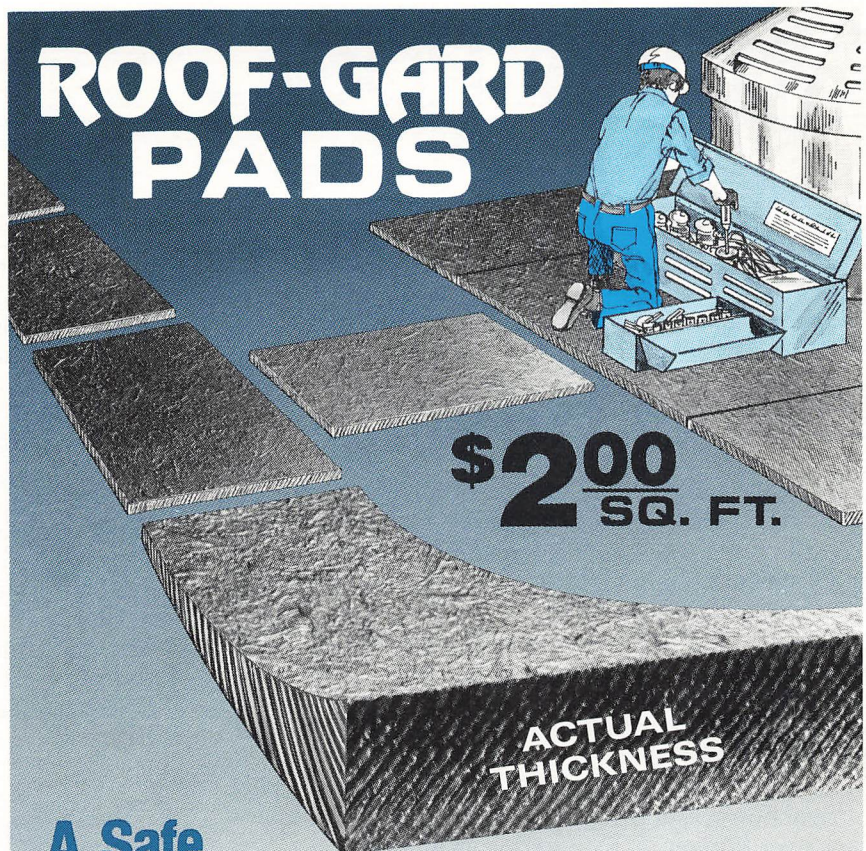
The Stanislaus Roofing, Inc. firm in Modesto, Calif. programmed its Apple II with the NRCA *Energy Manual* worksheet and now can calculate energy savings payback and the cost of insulation at the time of re-roofing.

The role of computers in the roofing business will increase in the next few years once computer-shyness is overcome and software compatible with roofing needs is developed.

Contractors are already discovering that computers save time and money.

"We have just recently mastered payroll, general ledger and accounts payable," explained an Amarillo, Tex. firm. "Time savings are going to be tremendous. We are just beginning to see the potential benefits."

And, from Atlanta, Ga., "I can't think of any other piece of equipment that has the potential to do so much for so little!"



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On The Roof...

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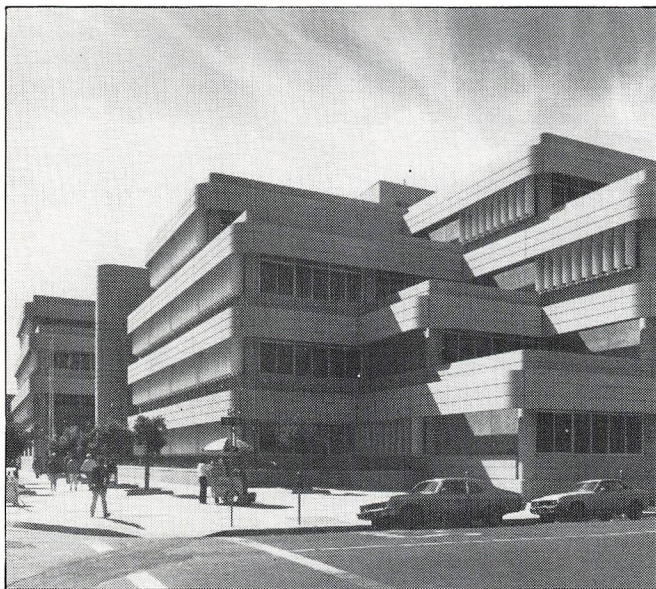
Since the early 1970s, energy-efficient technology has tried to keep pace with soaring energy costs. Today, structures are being designed and built which are capable of being lighted, heated and cooled at a fraction of the cost of a few years ago.

One such building houses the offices of the California Energy Commission. Its innovative design maximizes natural light to reduce the need for artificial illumination and utilizes concrete masses and a central atrium for temperature control.

The choice of roof system for this dramatically different structure was a traditional coal-tar, built-up membrane over Kopper's "Exeltherm" insulation.

The final design was the result of a collaboration between the California Office of the State Architect and Nacht & Lewis Architects, Sacramento. Project architects were Ivan Chew, AIA, of the state and Richard L. Lewis, AIA.

The four-story building is stepped in both plan and section to create relatively narrow interior spaces flooded with daylight. The offices are wrapped around a central atrium which provides circulation as well as natural lighting.



Newly completed four-story, \$11.7-million California Energy Commission Office Building, Sacramento, is expected to serve as an architectural prototype of things to come.

Contributing significantly to the energy efficiency of the building is the roofing system. The insulation, built-up membrane and flashing are all from Koppers Co., Inc.

The lightweight Exeltherm insulation is a composite board of urethane for insulation and perlite for fire resistance.

The built-up roof system covering the insulation uses four plies of felts embedded in coal-tar bitumen and topped with aggregate.

"KMM" Aluminum Membrane was used for flashing. It is a five-layer laminate composed of a flexible plastic core, modified bitumen, a top surface of heavy embossed aluminum foil and a bottom layer of polyethylene film.

The roof system was applied over a concrete deck by Yancey Co., Sacramento, an NRCA member.

Exeltherm and KMM are registered Koppers trademarks.



Crane Makes Unloading No Problem For NRCA Member

John McDaniel Wholesale Supplies, Atlanta, Ga., found business so booming they had to acquire a couple more, well, booms!

Since its inception five years ago, the NRCA Associate Member has grown steadily, recently adding a division in Savannah to serve south Georgia. To keep pace with the expansion the company equipped two flatbed delivery trucks with HIAB hydraulic cranes fitted with pallet forks.

The cranes have helped increase deliveries by almost 200 percent, according to Tom Kidd, who oversees deliveries for the wholesaler.

"The cranes are a far cry from the early days when we off-loaded trucks by hand," Kidd said.

"Using two men on a truck with no crane we did well to make three deliveries per day. Now, with one driver/operator on a truck with a HIAB crane we can make six to eight deliveries per day — and there's no physical strain on the driver."

The cranes are two different sizes. The smaller model is assigned to residential deliveries and can make up to three stops per truck load. It is also equipped with an optional proportional remote control. This allows the operator to operate the crane from up to 50 feet away.

The larger crane is used for industrial deliveries.



HIAB 650 hydraulic crane with proportional remote control system has helped John McDaniel Wholesale Supplies, Inc., of Atlanta, Ga., double on-site deliveries of roofing materials.

Both cranes have a flexible elbow and an extension boom. Their reach and maneuverability let the operators place materials over fences and other construction site barriers.

"Any alert individual with common sense can handle a HIAB crane," Kidd said. He lets new operators practice for a few hours in the company's storage area and then they are ready to go out alone to make deliveries.

By making their jobs easier and more productive the cranes have improved the mental attitudes of the operators, according to Kidd. "In fact, when an operator comes back from a delivery he's eager to load up and go out on another run," he said.



Chopper Pad Poses Rooftop Problems

And you thought you had problems with heavy roof traffic.

At Good Samaritan Hospital in West Palm Beach, Fla. 22,000 pounds of machinery regularly drops out of the sky and onto the top of one of their parking garages. But, far from being a catastrophe, the heavy traffic is actually helping to save lives.

As you may have guessed, that 11 tons of hurtling metal is one of several helicopters transporting emergency and high risk patients to and from the hospital. The choppers from the Coast Guard and the County

Sheriff's Department land at a pad on the roof of a newly built parking garage addition.

Even a lifesaving 22,000 pound load can be a real disaster for a roof, though. Not only is the weight a problem, but the frequent take-offs and landings add to the wear and tear on the roof's surface.

It was up to Stan Herrington of Peacock and Lewis Architects and Planners, Inc., West Palm Beach, to find a roof system that could withstand the punishment without adding too much weight to the roof itself.

The typical choice, concrete, was ruled out right away because of its weight. A concrete pad can add as much as 100,000 pounds to the weight of a roof.

Having had good success with TAMKO products and personnel on previous projects, Herrington discussed his problem with them. He learned that TAMKO had several helicopter pad installations already in use for which they had recommended their TAM-GLASS™ fiber glass roofing system in combination with their AWAPLAN™ modified bitumen.

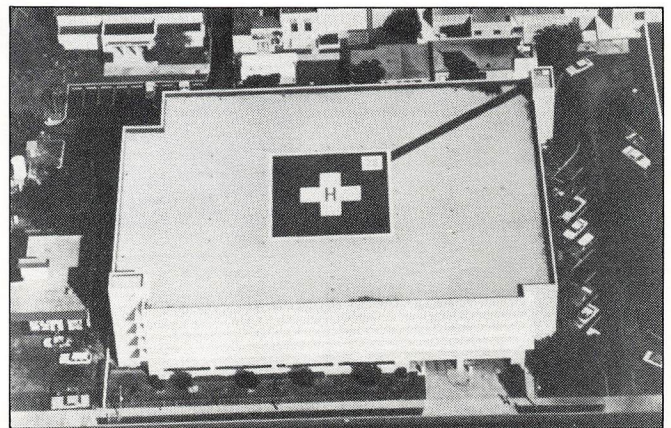
AWAPLAN is a continuous strand, needle-punched, polyester mat saturated with unblown, unfilled asphalt and coated with modified asphalt. Its increased traffic resistance and live-load capacity made it a natural choice for the pad.

Herrington decided to cover the entire concrete deck with TAM-GLASS. He chose AWAPLAN to cover the landing pad and the six-foot walkways to the rooftop elevators.

The work was performed by NRCA member Robertson Roofing Company, Delray Beach, Fla. Jack Brown was named project contractor.

The helistop became operational in November of 1982. Since then, it has been frequently used by the Sheriff's Department helicopter.

A recent inspection by Herrington confirmed that the roof system, including the AWAPLAN landing pad has performed well despite the heavy usage.



Helicopter pad, made with TAMKO's AWAPLAN, atop Good Samaritan Hospital in West Palm Beach, Florida.

New Products, Ideas, & Publications

Breakthrough Announced in On- site Batten Roll Forming

Ewald Stellrecht has added two new machines to its line of ESE equipment for metal roofing.

The Standing Seam Pan-former has the capacity to make both one inch and one and one-half inch standing seam pans.

The Snap-on Batten Machine is designed to form the cap, to the exact length necessary at the job-site. This speeds installation and cuts material waste.

Specially-designed cleats attach both the pan and cap on the snap-on batten, while allowing for expansion and contraction.

For additional information, contact Ewald Stellrecht, 407 Spackman Ln., Exton, Pa. 19341; 215/363-1141.

Check #97 on Reader Service Card

Detect Roof Moisture Without Punctures

Tramex Electronics, Inc. has added a new product to its line of non-destructive testing equipment.

The Tramex Wet Roof Detector (WRD) is a hand-held unit, specifically designed for finding moisture trapped beneath the surface and for finding the depth below the surface at which the moisture is located.

The WRD operates electronically. The detector is a solid state conductance meter which transmits and receives a signal through the roof covering. A beeper will sound when the signals come in contact with a conductive layer — trapped moisture.

Both the hand-held Wet Roof Detector and the larger size Dec-Scanner eliminate the need to cut cores or puncture the roof surface with probes.

Check #98 on Reader Service Card



MFM Presents Third Generation Felt

A brochure on Polyply, a third generation roofing felt, can be obtained through Mineral Fiber Mfg., Corp.

Polyply is a polyester-based material. The product offers higher tear strength, greater resistance to flex fatigue and higher elongation than first generation organic felts or second generation glass felts.

The material combines the flexibility of organic felts with the high strength and moisture resistance of fiber glass.

Polyply can be used in both hot and cold applied BUR systems.

For more information, contact Mineral Fiber Mfg. Corp., 313 S. Sixth St., Coshocton, Ohio 43812; 614/622-2645.

Check #99 on Reader Service Card

ODC's Fabric Covers Nearly Everything

ODC's silicone-coated fabric is highlighted in a brochure titled, "Our Fabrics Cover More Than Stadiums."

The factbook includes general product information, technical fact sheets and installation information.

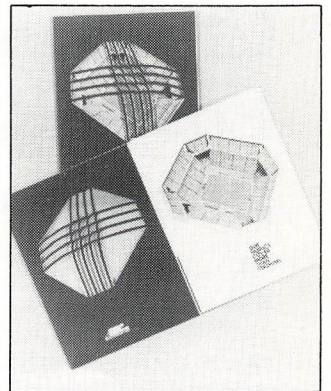
The translucent fabric has a wide range of structural applications. It combines the weathering properties of silicone with the added benefit of dirt release.

The silicone structural fabric is available in varying widths and weaves and can be used in the construction of stadium roofs, air or tension-supported structures, geodesic domes, sky lights and other structures.

ODC Inc. is a joint venture of Oak Industries, Inc. and Dow Corning Corp.

For more information, contact ODC Inc. at 4291 Communications Dr., Norcross, Ga. 30093; 404/923-3818.

Check #01A on Reader Service Card



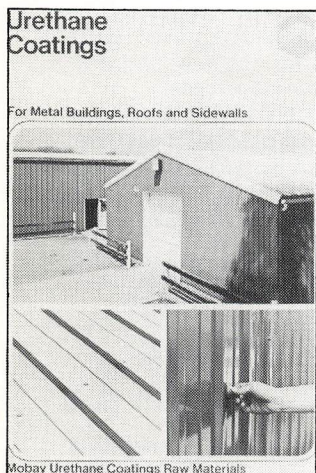
Mobay Suggests Urethane Coatings for Metal Buildings

An information package on urethane coatings for metal buildings is available from Mobay Chemical Corp.

The kit, "Urethane Coatings for Metal Buildings, Roofs and Sidewalls," contains case history field reports, a booklet explaining why urethane finishes are ideal for repainting steel building paneling and bulletins on painting and repainting preparation, maintenance cost savings, property and performance characteristics and production economics.

For copies of the information kit, contact Mobay Chemical Corp., Plastics and Coatings Div., Pittsburgh, Pa. 15205.

Check #02A on Reader Service Card



Gerard Enters U.S. Tile Market

Developed in New Zealand after World War II, Gerard lightweight tile is now available in the United States.

According to Gerard Tile Co. USA, Inc., its tile is approximately six times lighter than real tile and needs no extra reinforcing in the roof structure.

The tile is coated with a self-priming acrylic resin which contains additives to prohibit the growth of fungus, mildew and acids. A coating of stone granules is then added, and a 100 percent pure acrylic overglaze is sprayed over the stone chips to bond and beautify the tile finish.

In the U.S., Gerard tile has a class "B" fire rating for both new construction and reroofing over shake and shingle.

When installed over an existing shake, shingle or composition roof, the Gerard tile system gives an insulating factor because of the dead air space created between the two roofs.

Installation can be carried out in all weather conditions without tear-off and clean-up expense.

The tiles have been tested in Canada, Alaska, the Middle East and Asia.

Check #03A on Reader Service Card

EPS Information From Hoechst

Hostapor Expandable Polystyrene is described in an eight page, color brochure from American Hoechst Corp.

Properties of expanded polystyrene and expanded polystyrene board, manufactured from Hostapor EPS, are detailed in the booklet.

Performance characteristics such as moisture, water absorption and weathering are also included, in addition to specifications and standards compliance.

For more information, contact American Hoechst Plastics, 289 N. Main St., Leominster, Mass. 01453; 617/534-2627.

Check #04A on Reader Service Card

Rubber Pads Ideal for Roof Walkways

"ROOF-GARD" pads can be used for heavily traveled roofs, where stone is not desired or for the installation of walkways.

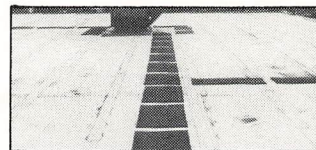
The pads are manufactured by the Humane Equipment Co. They are constructed of reprocessed rubber with a textured, non-skid surface which provides safer, surer footing even when wet.

"ROOF-GARD" pads are 3/4" thick and easily cut to fit around drain openings or other roof obstructions.

The pads can be spot sealed with compatible synthetic EPDM or PVC roofing adhesives.

The standard sizes available include: 4' x 5', 4' x 6', 2' x 6', 3' x 4' and 2'6" x 4'.

Check #05A on Reader Service Card



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Exeltherm Xtra insulation is a rigid, thermally efficient, thermoset phenolic foam. This unique insulation is superior to urethane, isocyanurate, and other traditional insulation materials, and is an excellent component in Class I Construction.

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Xtra: fire resistance properties
ASTM E 84

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- Smoke development... 5

Xtra: dimensional stability... more stable than other foam insulations

Xtra: safety... the potential fire hazard of many other insulations is virtually eliminated

Xtra: high thermal-resistance/thickness ratio

Xtra: good water vapor permeability

With its extra-valuable combination of properties and characteristics, Exeltherm Xtra will maximize the

results you want from an insulation in the form of energy conservation; lower building operating cost; better control of interior surface temperatures and air temperatures.

To find out more about this outstanding new product, send the coupon or write Koppers Company, Inc., Department 3C-3, 1901 Koppers Building, Pittsburgh, PA 15219.

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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 \$10.00 to total order. Send ad copy and payment to: Advertising Manager, *Roofing Spec*, 8600 Bryn Mawr Ave., Chicago, Ill. 60631

I WANT TO RETIRE

San Francisco area of California. Very old, established business. Primarily recover BUR on residential and commercial buildings. More than 50 years old. Same management for more than 20 years. Can be very liberal with terms to qualified buyers. Reply to Box 8A, *Roofing Spec*, 8600 Bryn Mawr Ave., Chicago, Ill. 60631.

PERSONNEL WANTED

CALIFORNIA MANUFACTURER of modified asphalt roofing products is seeking professional sales personnel for many areas in the 11 Western states. Must have experience in the roofing industry. Successful candidates will have experience calling on local distributors, architects and roofing applicators. Must possess all qualities necessary for successful marketing. Real growth opportunity. Salary, commissions, auto and expenses. Please send outline of work history, with income requirements to: Mr. Dave Jones, BehStev Corporation, 3651 Pomona Blvd., Pomona, Calif. 91768.

ROOFING MANAGERS

Successful roofing contractor wants to communicate only with the best in the business. Candidates must have a very successful experience in industrial and commercial reroofing sales. Opportunities available on West Coast that are unique and lucrative. Send work history and objectives to Speranza Management Consultants Company, 12 Johns Canyon Road, Rolling Hills, Calif. 90274.

ACQUISITION WANTED

Diversified roofing concern in Northeast New York seeks to acquire medium-sized roofing firm. Primary interest in single-ply operations with strong management to remain. Replies will be held in strictest confidence. Reply to Box 5A, *Roofing Spec*, 8600 Bryn Mawr Ave., Chicago, Ill. 60631.

MANAGER SOUGHT

Single-Ply operations of large, well-established firm in Albany, New York area. Estimating and managing industrial, commercial and institutional projects through completion. Send resume and salary requirements to Box 5B, *Roofing Spec*, 8600 Bryn Mawr Ave., Chicago, Ill. 60631.

ROOF CORE

ROOF CORE SAMPLER "C.R.R.E.L." type 1 7/8" core. Hardened Steel Jaws, compact weight less than 6 lbs. For details contact Autrey Steel & Machine, PO Box 40304, Tucson, Ariz. 85717. Phone 602/623-3444.

FOR SALE

Custom Aeroil 12 Ton Tanker. Completely done over - like new. All Diamond Plate Steel with own propane system. Worth over \$25,000 - a steal for only \$15,000. Contact: AAA Roofing, 30 Dragon Court, Woburn, Mass. 01801. 617/935-7556.

COMPANIES WANTED

If you are a successful roofing and sheet metal contractor and want to, 1) Eliminate your personal financial risks, and 2) Join a recognized industry leader, we have cash to tailor a buyout to suit your situation. You should have sales of over \$1 million with some profit and be located in the Sunbelt. Please send all replies to Box 9A, *Roofing Spec*, 8600 Bryn Mawr Ave., Chicago, Ill. 60631.

MANAGER SOUGHT

Well established commercial and residential roofing contractor in the Salt Lake City area requires well rounded-manager with five years experience. Please send resume and salary requirements to P.O. Box 9B, *Roofing Spec*, 8600 Bryn Mawr Ave., Chicago, Ill., 60631.

SALES OPPORTUNITY

Southern California Roofing Company located in Los Angeles County, established in 1926, is in need of a roofing salesman thoroughly experienced and successful in commercial, industrial and public works reroofing sales. Only energetic self-starter whose interest in a profitable and successful future through hard work should apply. Please send resume to:

Mr. Harold R. Provin, G.E.O.
Southern California Roofing Company
9623 Imperial Highway, P.O. Box 158
Downey, Calif. 90241
Phone 213/861-7283

CONSULTING SERVICES

Independent roof consultant will do warranty and pre-installation inspections in New England. Other services available. Contact PRESERVE ASSOCIATES Inc., PO Box 591, Scituate, Mass. 02066. 617/545-5284.

GUIDE MAKES SPECIFYING EASY

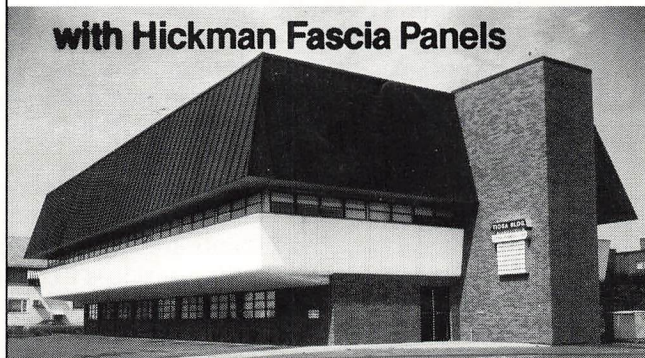
The new *NRCA Roofing Materials Reference & Guide* is the perfect library companion to *Roofing Spec* and the *NRCA Roofing and Waterproofing Manual*. The *Guide*, updated three-times annually, lists important technical data for both BUR materials and single-ply membranes. For more information, contact NRCA, *Roofing Materials Reference & Guide*, 8600 Bryn Mawr Ave., Chicago, Ill. 60631.

REPS WANTED

Manufacturer of a single-ply roofing system, UL Class "A" and F.M. approved, 20-year warranty, seeking representatives calling on roofing contractors. New England, New York, Pennsylvania, North and South Carolina, Maryland, Arizona and California are the states open. Call our toll free number, 1-800/248-0280. Ask for John or Bill.

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Tech Talk

By Bob LaCrosse, CAE
Director of Technical Services

Roof Consultants

Many calls come to the NRCA Technical Services department requesting names of roofing consultants. The calls come not only from contractors, but from others needing assistance with roofing applications, problems, materials and the like.

To assist in this regard, a list of roofing consultants was prepared in January, 1981. NRCA, by preparing the list, does not recommend the use of a roof consultant or, by inclusion on this list, NRCA does not attest to the qualifications of any of the listed individuals to serve as roof consultants. The list was prepared for the sole purpose of identifying individuals, firms, labs and university affiliates offering roofing consulting.

Each of the listed parties were in one of four categories which, to the best of NRCA's knowledge, most closely represents the party's affiliation.

The list needs updating because of all the changes occurring in the industry since it was first prepared. Due to the reorganization of roofing consultants by one group, and the establishment of a second new group of consultants, the status of the new list is questionable at present. But first, some background.

An old saying goes that a consultant is anyone "50 miles from home," or anyone "away from home with a set of slides." Maybe so for some, but not in the majority of cases involving roofing consultants.

Roofing is now recognized as a complex subject requiring a more specialized knowledge than many building designers have. Consultants are now available to provide competent roof consulting services to architects, engineers, roofing and general contractors, roofing manufacturers and building owners.

ASTM has identified the characteristics for a good roofing consultant in ASTM D936, *New Standard Practice for Roof System Assemblies Employing Steel Deck, Preformed Roof Insulation, and Bituminous Built-Up Roofing*. To quote:

"The Roofing Consultant should be individuals or firms of established competence having professional qualifications as roofing consultants who are engaged in the field of roofing technology. The Roofing Consultant should be knowledgeable in field investigations, sampling procedures, laboratory analysis and testing, design counseling and review, be able to prepare complete contract documents, such as: specifications, drawings and details for roofing systems, structural analysis and design of roof decks, observe roof construction work

for compliance with the contract as well as specifications and details, report preparation and life-cycle costing services for roofing systems.

"Roofing Consultants should accept assignments only to the extent that they are fully qualified to carry them out to a successful conclusion, based upon education, training and experience. If not, they should utilize the services of other qualified consultants for assistance.

"Roofing Consultants should have a thorough knowledge of the conditions to which the roof assembly will be exposed during construction, as well as during its life and protection for a building.

"The Roofing Consultant's professional conduct should be responsible, prudent, honest and impartial, and he should strive for the highest levels of excellence that effort, training, management and scientific method will allow. He should not accept any assignment involving conflict of interest, directly or indirectly, unless all parties involved have been appropriately informed of all pertinent facts. He should accept compensation exclusively from the client who has engaged him, and should not agree to any form of contingency fee or other arrangement where he could be financially interested in the outcome of an assignment. He should perform his consulting work without any fear or favor, reporting the facts as he sees them, even if they are unfavorable to his client. He should treat all information obtained during any engagement as confidential, and not reveal anything to others without his client's specific approval. He should give professional opinions only in the field of competence, and draw conclusions only on the basis of fact and knowledge, rather than on the basis of assumptions or generalities. If he encounters a problem for which he has no justifiable answer or solution he shall so state."

NRCA will cooperate to the fullest extent possible with such individuals, firms and organizations offering roofing consulting services for the betterment of the industry and to improve on and lessen trouble or problem roofs. As expressed here previously, NRCA cannot and will not show preference or give partiality to one contractor over another or show preference towards products or assemblies. NRCA strives in every way possible to assist in the application of trouble-free roofs.

I recently attended a meeting of the re-activated Institute of Roofing and Waterproofing Consultants founded in 1972. This group has maintained a low profile since its inception, but has now established new by-laws, appointed officers and directors, re-evaluated membership and has established a national headquarters. The W. Keating Co., Hinsdale, Ill., has been retained to handle the affairs of the institute.

I was also asked to attend a meeting of a newly formed organization designated as the Roof Consultants Institute, formerly known as the Association of Roofing Consultants & Surveyors. This organization represented those involved in roof moisture detection. (According to its by-laws, however, it's membership could involve all roof consultants.)

In the future, closer liaison and working relationships can be established between the roofing consultants groups and NRCA, similar to the liaison established by NRCA with the many other organizations dedicated to the betterment of the roofing industry.



NBC's new roof tops the ratings.



They specified Carlisle single-ply

NBC is proud as a peacock about the new Carlisle roofing system covering their Computer Center in New York. The 30,000 square-foot adhered single-ply roof enabled them to protect the millions of dollars worth of computer equipment below, after the original roof began to fail. They were also able to preserve the architectural integrity of the roof's stunning geometric forms. But above all they got the expertise and assured performance that come with every Carlisle roof.

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. Insulation. Flashing. Edging. Factory pipe seals. And application materials. We even train our approved single-ply applicators at our school in Carlisle.

What's more, a Carlisle single-ply roof can be easily installed in almost any weather. And it can be warranted for up to 15 years!

Call or write today for more information about the single-ply roof that American business is banking on. The Sure-Seal™ roof.

Carlisle SynTec Systems, Division of Carlisle Corporation,
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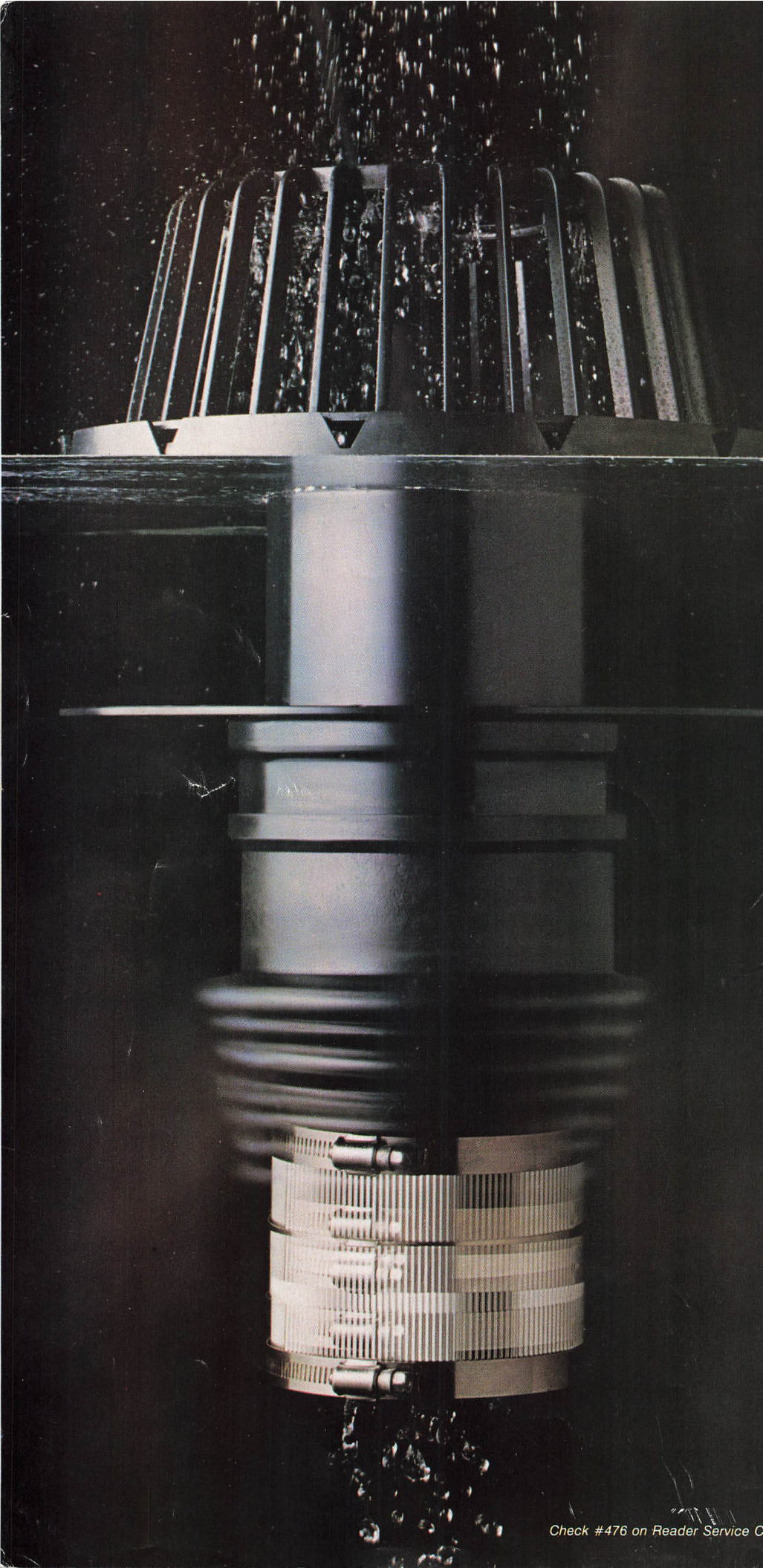
The roof that's requested by name.

Carlisle SynTec Systems

CARLISLE

Applicator: Nicholson & Galloway Inc., Glen Head L.I., NY
Architect: Peter Simoncelli & Assoc., Narberth, PA

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Pipe dream from Manville.

The Manville Flex-I-Drain™ flexible drain system performs like a dream. And is a dream to install.

A look at its patented construction reveals the reasons. First, it's tough yet lightweight, made of high rated impact strength, heat-resistant Noryl® SE-1 and flexible neoprene.

Its simple, three-piece design permits quick, completely waterproof installation on both new and reroofing jobs. In three easy, labor-saving steps. It comes in one convenient package. No blocking or rings required. And its unique, bellows-type construction adjusts in all directions to moderate roof deck and drain pipe movement. So the drain and roofing system remain functional.

Manville Flex-I-Drain is compatible with Manville built-up roofing systems and is available in white acrylic for use with single ply systems. And it's eligible for coverage under the Manville Guaranteed Roof Program. It also may be used with other roofing systems.

Select Flex-I-Drain for your building and everyone comes out ahead. The architect because it really performs. The contractor because it installs quickly. The building owner because he gets better roof drainage.

For details, consult Sweet's or contact Bob Graboski, Manville Roofing Systems Division, Ken-Caryl Ranch, Denver, Colorado 80217. (303) 978-2228.

Manville

Dear Reader:

This is your copy of **Roofing Spec**, the only monthly magazine devoted exclusively to the roofing and waterproofing industry. We hope you find it useful and interesting. If you'd like an additional subscription for this publication, simply complete and return the postpaid card provided below. If you are currently receiving **Roofing Spec** on a complimentary basis, please return the enclosed card with payment to ensure that you will continue receiving this valuable roofing resource.

In future months we have articles planned on:

- Design considerations for BUR
- Single-ply roofing systems
- Solar installations

Recent issues have featured stories on:

- Architect-Contractor relations
- Problem survey results
- NRCA programs and meetings
- Fiberglass roofing felts
- European roofing experience
- BUR performance tests
- Sprayed-in-place urethane foam roof insulation
- Steep roofing
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<input type="checkbox"/> 474 Humane Equipment	31	<input type="checkbox"/> 01A ODC Inc.	34
<input type="checkbox"/> 475 Koppers Company, Inc.	36	<input type="checkbox"/> 02A Mobay Chemical Corp.	35
<input type="checkbox"/> 476 Manville Corp.	40	<input type="checkbox"/> 03A Gerard Tile Co. USA, Inc.	35
<input type="checkbox"/> 477 Parker Sweeper	11	<input type="checkbox"/> 04A American Hoechst Plastics	35
<input type="checkbox"/> 478 Red Bell	11	<input type="checkbox"/> 05A Humane Equipment Co.	35

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