

National Roofing Contractors Association

ROOFING SPEC

AUGUST
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Identifying markets key
to success in reroofing





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ROOFING SPEC

Vol. 14, No. 8 August 1986



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Finding and developing potential clients should be the first step for any company planning a marketing strategy for reroofing. Cover by McGarity/Hart Design.

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Federal amendment bans retainage without cause

Retainage can no longer be held without cause on federal construction projects, according to an amendment to the Federal Acquisition Regulation (FAR) issued by the Department of Defense, the General Services Administration, and the National Aeronautics and Space Administration.

The new regulation implements an Office of Federal Procurement Policy (OFPP) letter issued in May 1983, which declared that "retainage should not be used as a substitute for good contract management," and that decisions to withhold retainage must "be made by contracting officers on a case-by-case basis."

Declaring the new contract a victory for the construction industry, American Subcontractors Associa-

tion (ASA) Legislative Committee Chairman Jesse M. Pickett Jr. said that "although the OFPP policy letter was issued more than three years ago, many contracting officers have been slow to implement it because the actual language in federal contracts remained fuzzy. The new contract language makes it clear that contracting officers should not be withholding retainage as a matter of routine."

As of May 30, all new contracts for federal construction require payment to be made in full if the contracting officer finds that satisfactory progress has been made during any period for which a progress payment is to be made. A percentage payment without retention must be made upon "completion and acceptance of each sepa-

rate building, public work, or other division of the contract for which the price is stated separately in the contract."

However, the new government contract language applies to direct contractual relationships only. So, ASA is urging subcontractors to demand that if there is any retainage withheld by a general contractor, it should not exceed the amount withheld by owners in their payments to the general contractors.

Pickett noted that the benefits the government hopes to realize from the policy change—lower prices and faster completion—will not be fully realized "unless the burden of retainage is lifted from those actually performing the construction."

Subcontractors defend right to prompt payment at Senate hearing

The U.S. Senate Committee on Small Business heard testimony in June from groups concerned about prompt payment from government agencies.

Among those testifying was the National Association of Plumbing-Heating-Cooling Contractors (NAPHCC) Government Affairs Director Dennis Lavallee. He noted that the 1982 Prompt Pay Act, which requires federal agencies to pay their bills on time or pay interest on late payments, has alleviated a number of problems.

"Unfortunately," he added, "it left other crucial matters unsolved, such as flow-through of payments to subcontractors, prompt payment on federally assisted work and timely progress payments by the government."

Lavallee expressed support for the changes in the Prompt Pay Act included in Sen. Paul Trible's, R-Va., bill, S. 2479. But, he said, even these do not address the problems facing small businesses that supply the goods and services to the govern-

Firms performing work for the federal government often experience payment delays in excess of the construction industry standard.

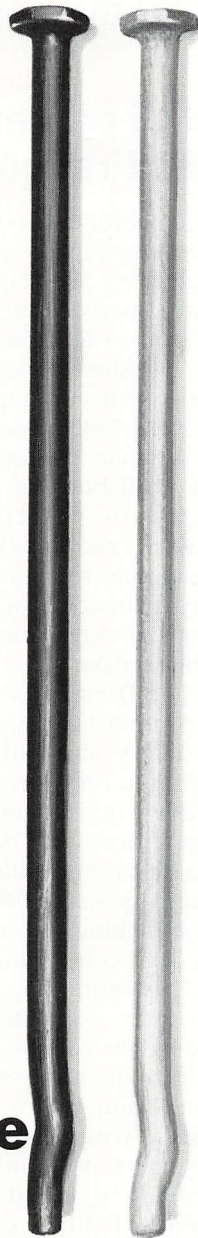
ment's general contractors but never come into direct contact with the government themselves.

"Just as small business cash flow and economic survival can be critically injured by slow pay in direct relationships with the government, so also can small business be hurt when providing goods and service

through intermediaries," Lavallee explained to the Committee.

Lavallee reported that the results of a recent survey of NAPHCC members show that firms performing work for the federal government often experience payment delays in excess of the construction industry standard, and that many of these payments pass through intermediaries. He urged the government to pass legislation extending the terms of the Prompt Payment Act to subcontractors.

"This will benefit the government by encouraging quick completion of projects and will provide fair treatment of and for participants in the project," Lavallee told the Committee. He also feels that interest on delinquent payments due the general contractor from the federal government should be passed on to the subcontractor that did the work.



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ARMA members cited for safe operations

Five roofing plants, operated by companies that are members of the Asphalt Roofing Manufacturers Association (ARMA), were cited for their outstanding plant safety records in 1985 at a recent meeting of the ARMA Board of Directors in Denver.

The companies received the ARMA President's Safety Award, honoring plants with the best safety records in their categories.

The 1985 winners were Celotex Corp., Perth Amboy, N.J., in Group A (more than 400,000 manhours); GAF Corp., Mt. Vernon, Ind., in Group B (275,000 to 400,000 manhours); GAF Corp., Minneapolis in Group C (175,000 to 275,000 manhours); Owens-Corning Fiberglas Corp., Houston, in Group D (125,000 to 175,000 manhours); and Koppers Co., Wickliffe, Ohio, in Group E (25,000 to 125,000 manhours).

Making the presentation at the directors meeting was Roger H. Bengtson, president of ARMA.

April's 15 percent increase over March reverses first quarter's contracting slump

A surge of construction contracting in April more than made up for this year's first quarter shortfall, putting 1986 activity 2 percent ahead of last year at the end of four months, the F.W. Dodge Division of McGraw-Hill Information Systems Co. reported.

A record \$248.7 billion (annualized rate) of newly started construction projects in April boosted construction activity 15 percent above March's weak rate of building. Double-digit gains were reported in all three broad categories of construction: housing, non-residential building and public works.

According to Dodge vice president and chief economist George A. Christie, "Uncertainty about the consequences of tax reform proposals on real estate development and on local public works financing has led to unusually erratic non-residential construction activity since 1986 began. In April, a bunching of commercial and public projects, which might ordinarily have gone ahead during the first quarter, coincided with a generally stronger volume of homebuilding to give the impression that a new building boom is in the making. Actually, even with April's belated surge, this year's four-month cumulative total of newly started construction is merely holding even with 1985 volume after adjustment for inflation."

April contracting for non-residential building rose 14 percent to an annualized \$79.9 billion. Commercial and industrial building was the source of most of the month's improvement, although institutional building also showed a modest gain.

Non-building construction also surged in April, with a 21 percent increase to a seasonally adjusted annual rate of \$45 billion. All categories of public works construction—highways, bridges, water supply and waste treatment facilities—shared in the month's gain.

Christie pointed out, "Now that it is clear that the House and the Senate versions of tax reform legislation both sustain the tax exempt status of municipal bonds, public works con-

tracting should be steady."

In response to lower interest rates, contracting for all categories of residential building rose 13 percent in April to an annualized rate of \$123.8 billion.

At the end of four months, the unadjusted total of 1986 construction contracting was \$70.8 billion, a gain of 2 percent over the same 1985 period. Regionally, the Northeast and North Central areas are ahead of their 1985 pace by 9 percent and 8 percent, respectively, while the South and West are both trailing last year's contracting by 2 percent.

The following chart is a summary of the latest month's Dodge construction statistics, which measure the value of newly started construction that will be brought to completion over the months ahead.

1985 construction costs up 1.7 percent

The cost of construction materials and labor across the nation increased an average of 1.7 percent in 1985, reported the Cost Information Systems Division of McGraw-Hill Information Systems Co. This marks the lowest rise in 15 years.

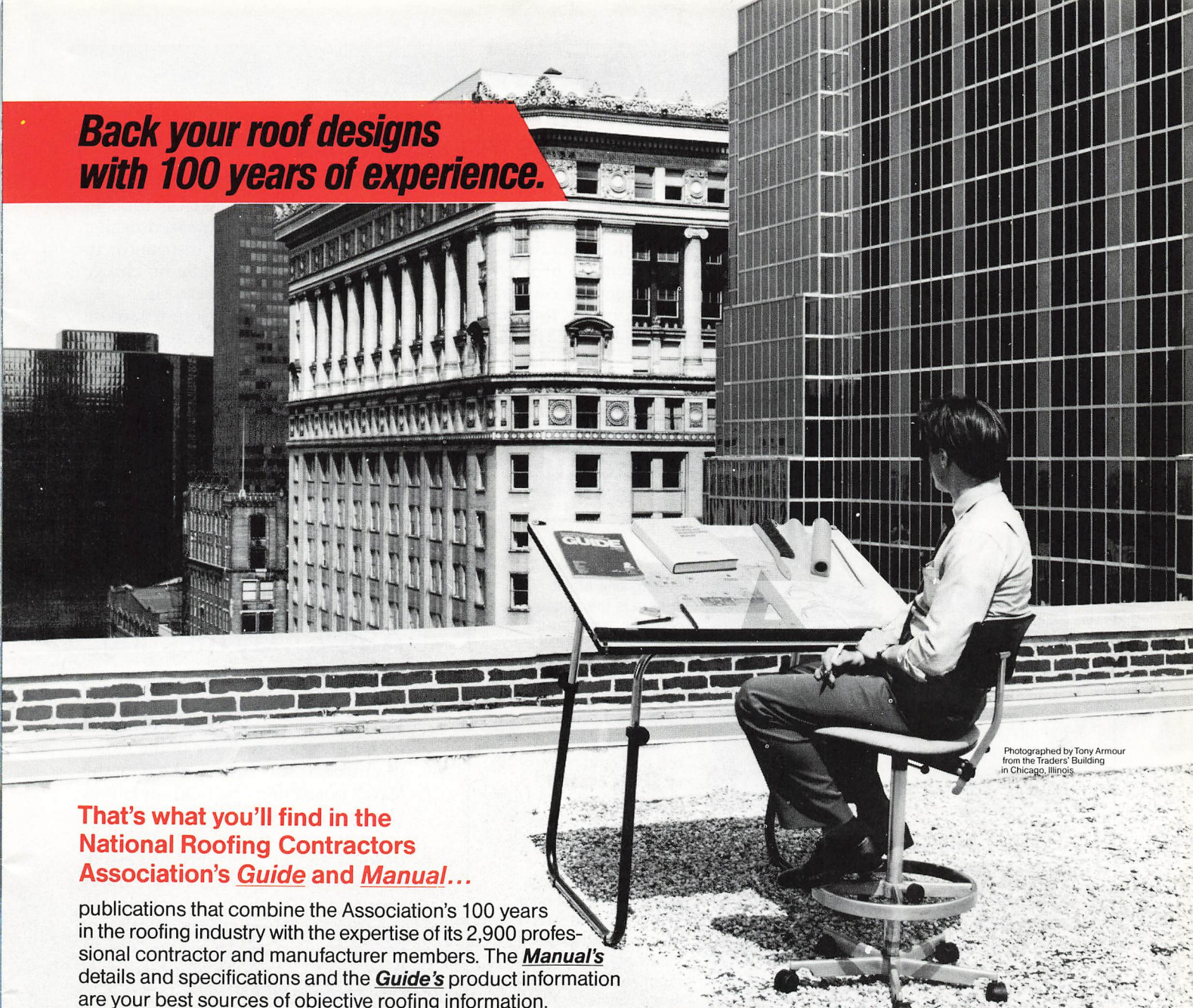
The price information, in the form of local Dodge Building Cost Indexes for 183 metropolitan areas in the United States, is based on a semi-annual survey of building trade unions, contractors and material suppliers in these cities.

The greatest cost jump for the period, 3.2 percent, was in the six New England states, while the smallest increase, 0.7 percent, was in the Pacific Coast and Rocky Mountain states.

The full report, titled "Dodge Building Cost Indexes for U.S. and Canadian Cities" may be purchased for \$20 from McGraw-Hill Cost Information Systems, P.O. Box 28, Princeton, N.J. 08543

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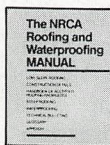
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Some Senco air-powered fastening tools requiring retrofit

Senco Products, Inc., the Cincinnati-based manufacturer of air-powered fastening systems, has announced a tool retrofit for Models SN2, SFN2, SN4, and AST4. Any of these tools manufactured prior to April 1983 can, under certain conditions, unexpectedly discharge a fastener. The ret-

rofit will replace the upper remote trigger core of the faulty tools.

Although only a small percentage of the tools mentioned in the retrofit announcement will be problematic, the company urges all owners and operators of any of the four models with serial numbers 72100001 to

83399999, and all tools with numbers ending in H, to take the tools to the nearest Senco authorized dealer, sales/service center or distributor to be checked. There will be no charge for the inspection and retrofit.

Additional information regarding the location of Senco outlets across the country is available by writing Senco Product Support, 2001 Ford Circle, Suite D, Milford, Ohio, or by calling 800/221-4325 (east of the Mississippi), 800/445-9199 (west of the Mississippi), 800/982-6348 in California, and 800/433-7265 in Texas and Oklahoma.

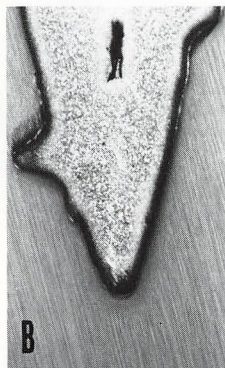
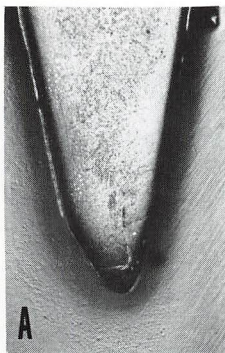
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The inner structure of metals used in manufacture determines a screw's ability to resist costly, time wasting, twisting and breakage under torque.

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tance to twisting and breakage under torque. This screw can really take it! The tiny diamond marks were left by the hardness measuring

punch. The black outline is the space between screw and mold holding it.

Now to Micro-photo B. Lack of consistency in core structure reveals low carbon content steel, a soft core and manufacture of cheaper grade C-1010 of 1012 wire. Case hardness is minimal. Case density irregular. That hole in core center is sure evidence of poor quality material and will likely cause the screw point to "mushroom" and fail to penetrate the deck. High rates of breakage are the costly product of screws like this.

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ASC/ASA alliance discussed at ASC's May meeting

The relationship between the American Subcontractors Association (ASA) and the Associated Specialty Contractors, Inc., (ASC) was one of the issues discussed by the trustees of ASC at the May 7 board meeting held on Hilton Head Island, S.C.

Comments on past joint activities of local ASA groups were discussed. Jesse Pickett and Chris Stinebert represented ASA in a presentation to the trustees. During the presentation, they submitted a proposal that would have ASA provide administrative services for ASC.

This was followed by a report from the Committee on Staff Continuity, which recommended that the administration of ASC be continued in its present form, using part-time staff and the facilities of member organizations. The Committee recommended that its authority should continue until arrangements are completed for the administration of ASC after current president Robert Wilkinson's retirement.

The Board took the Committee's recommendations and voted not to accept the ASA proposal for administering ASC.

Check #29 on Reader Service Card

Building products sales up 5 percent in first quarter

Like many other manufacturers, producers of building products experienced a modest gain in sales during the first quarter of 1986, but saw their profits erode, according to an analysis of the industry by the construction information group of McGraw-Hill Information Systems Co.

First quarter sales advanced an average 5 percent over 1985 levels, but with costs rising and prices remaining steady, profits were squeezed to 4 percent below the first quarter level of a year ago.

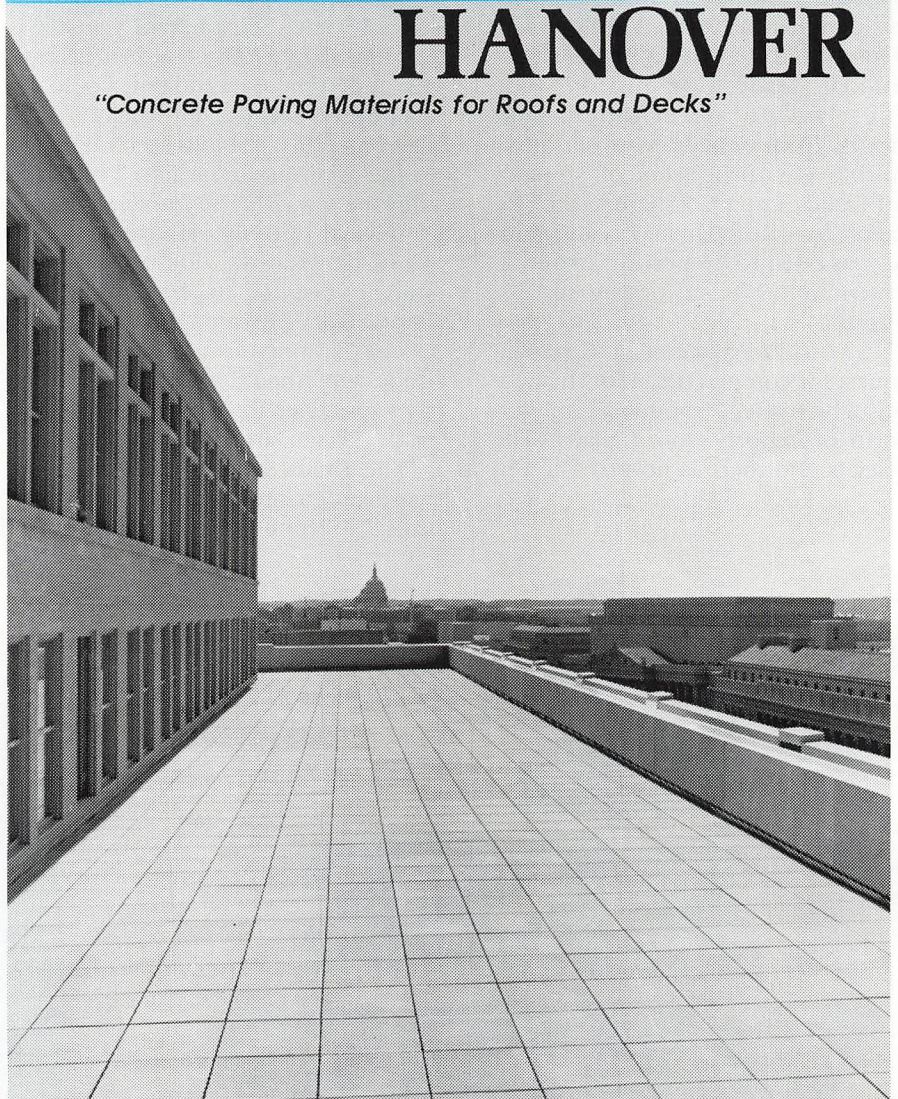
"Competitive pressure from lower-priced imports was the main reason for shrinking first quarter profit margins," said George A. Christie, vice president and chief economist for the Construction Information unit. "Manufacturers of products most vulnerable to external competition—lumber, cement, steel and heavy construction equipment—are the industry's hardship cases."

The best results for the first quarter were achieved by coatings (profits up 55 percent), gypsum (up 23 percent), plumbing products (up 19 percent) and electrical products (up 10 percent). All of these products are supported by the burgeoning homebuilding market. Homebuilding has been bolstered by lower interest rates, which are expected to remain low through the year.

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Canadian wood roofing tariff imposed to protect U.S. industry

A 35 percent tariff to be imposed on Canadian shakes and shingles for a five-year period was announced by President Reagan May 22, following a six-month investigation by the International Trade Commission. The investigation determined that imports from Canada were seriously injuring U.S. producers of shingles and shakes. Canada's share in the U.S. market for red cedar shakes and shingles has risen to 73 percent, from 40 percent in 1978, according to U.S. officials.

U.S. officials rejected a Canadian request for compensation for the new levy, which affects about \$182 million worth of imports from Canada. The officials said there is no provision in

U.S. law to allow for compensation in the shake and shingle case.

Meanwhile, Canadian Finance Minister Michael Wilson said Canada is considering various countermeasures, but added the government would act cautiously because of the "possible repercussions, if things aren't handled in the appropriate fashion," reported the June 3 *Wall Street Journal*.

Wilson told the House of Commons that Canada doesn't want the shingle dispute to escalate into a "trade war." He said Canada's "objective is a long-term comprehensive trade agreement" with the U.S. The two countries are due to resume their trade talks in late June.

The finance minister's comments were much more conciliatory than those of Prime Minister Brian Mulro-

ney. When advised of the U.S. action, Mulroney sent a telex to President Reagan terming the U.S. levy pure protectionism, and warned that Canada would be "forced to consider an appropriate response."

Although Washington has been subdued in its response to Mulroney, the Reagan administration is standing strong on the issue. U.S. officials meanwhile complain that the Canadian authorities have shown little appreciation of the problems of the U.S. cedar shingle industry or the strength of protectionist sentiment in the U.S. Congress.

continued on page 14

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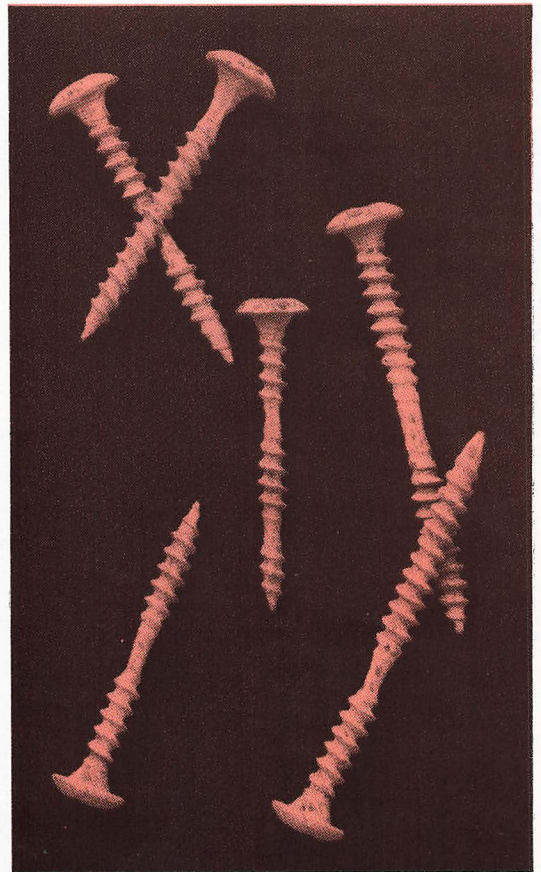
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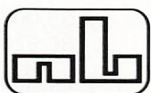
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Check #21 on Reader Service Card

Construction salaries anticipated to rise 5 percent in 1986

Contractors are anticipating granting an average annual salary increase of 5.02 percent during 1986 for their operational personnel. The largest increase, 5.41 percent, is expected in the New England states, while the Midwestern states expect 4.47 percent, the smallest increase.

The 1986 edition of the Personnel Administration Services, Inc., (PAS) *Construction/Construction Management Staff Salary Survey* details the salaries and bonuses currently being paid to more than 9,000 professional and technical construction employees. The survey breaks down the information for each position by type of construction performed, type of contractor, revenue size, bid type and geographic location.

According to the survey, the average total compensation for project managers is \$53,921, with firms reporting more than \$250 million in revenues paying an average of \$74,954, and firms doing less than \$5 million reporting an average of \$41,977.

Business development directors reported the highest average total compensation at \$82,241, with the accountant I classification reporting the lowest average at \$21,010.

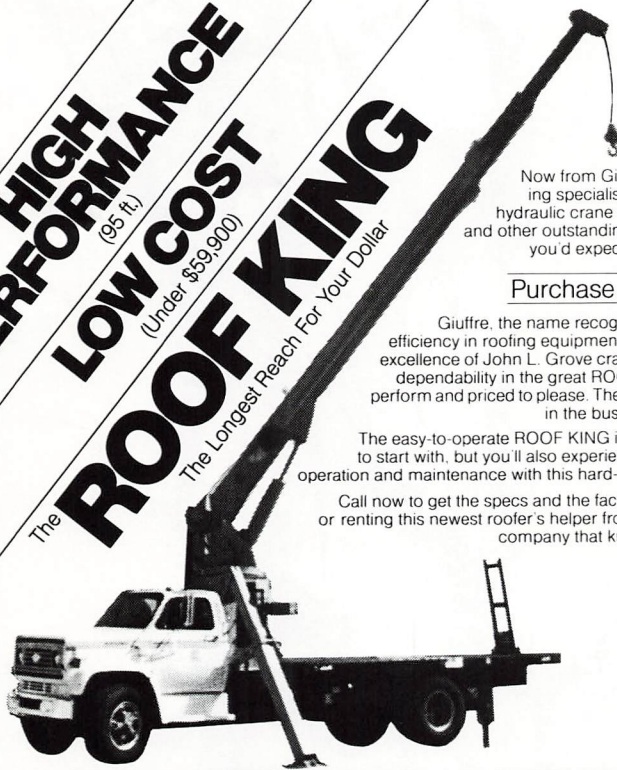
The following is a list of the median base salaries of construction positions for all companies reporting.

MEDIAN BASE SALARIES OF CONSTRUCTION POSITIONS 1986 SURVEY—ALL COMPANIES INCLUDED

Assistant Superintendent	29,000
Superintendent	35,000
Project Superintendent	39,000
Project Manager/Estimator	34,000
Construction Manager	46,748
Project Manager	46,475
Field Engineer I	26,070
Field Engineer II	30,000
Chief field Engineer	35,620
Project Engineer	37,700
Estimator I	24,500
Estimator II	31,000
Senior Estimator	39,719
Chief Estimator	45,319
Cost Engineer I	25,402
Cost Engineer II	29,585
Senior Cost Engineer	38,520
Cost Engineering Manager	49,920
Scheduling Engineer I	25,800
Scheduling Engineer II	32,000
Senior Schedule Engineer	41,200
Scheduling Manager	46,490
Contract Administrator I	26,000
Contract Administrator II	31,500
Senior Contract Administrator	38,480
Contracts Manager	44,700
Buyer	25,753
Purchasing Agent	34,082
Warehouse Supervisor	27,800
Materials Manager	34,200
Quality Control Engineer	31,340
Quality Control Specialist	33,100
Senior Quality Control Engineer	38,480
Quality Control Manager	45,000
Pre-Op Engineer	31,240
Senior Pre-Op Engineer	39,200
Project Pre-Op Engineer	46,000
Pre-Op Manager	52,000
Accountant I	18,360
Accountant II	22,500
Accounting Supervisor	27,000
Accounting Manager	37,000
Office Manager I	23,010
Office Manager II	27,248
Assistant Safety Director	33,000
Safety Director	39,520
Personnel Recruiter	24,360
Personnel Specialist	27,600
Personnel Supervisor	33,400
Human Resources/Personnel Manager	43,800
Business Development Manager	42,640
Business Development Director	60,000

Source: 1986 Construction—Construction Management Staff Salary Survey PAS—Personnel Administration Services, Inc. Ann Arbor, Michigan

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Cuje joins Bond Cote as Western sales manager

Robert H. Cuje has been named Western regional sales manager for Bond Cote Systems. Cuje's headquarters will be in Denver.

Cuje comes to Bond Cote from Firestone Building Products, where he was product promotion specialist. He was also managing partner of the Weathercraft Co. and a salesman for the GAF Corp.

Cooley makes new appointments

Cooley Roofing Systems, Inc., (CRSI) has named Ed Cates field technician, and Donald C. Hansen and Michael H. Jacobsen regional sales managers.

Cates' responsibilities will include training contractors to install the company's single-ply roofing systems and use associated equipment. He will also be responsible for interim and final inspections of warranted projects, and quality control inspections of ongoing roofing projects. Also, Cates will provide technical assistance and general consulting to CRSI roofing contractors and customers. Cates joined CRSI in 1985 after 15 years as a field superintendent with Texas Roofmasters in Houston, where he was responsible for supervising installations of CRSI's Cool Top 40 roofing system. Cates has also held roofing positions at Sierra Construction in Independence, Mo., and at Subco in Grandview, Mo.

Hansen's responsibilities include overall sales management and technical support to the company's customers in Florida. Hansen has more than 25 years of experience in the architectural, engineering and roofing industries. Prior to joining CRSI, Hansen was manager of owner/architect sales at the Barra Corp. of America, where he was also regional manager for Florida and the Bahamas.

An active member of the Construction Specifications Institute, Hansen has been the recipient of numerous

CSI awards, including the Dan Bodine Memorial Award for Attainment of Special Overall Proficiency in Specification Writing.

Jacobsen's responsibilities will include overall management of sales in North Carolina, South Carolina and Virginia. He will also provide technical support to CRSI customers. Before joining CRSI in September 1985, Jacobsen was sales and technical advisor at W.R. Grace & Co.

Goodyear chooses European division manager

Goodyear has selected Scott Birch as manager of the company's new European Roofing Systems Division. His headquarters will be at the company's Luxembourg facilities, and his duties will include supervising sales and administrative activities as well as traveling throughout the United Kingdom and Europe.

Birch's promotion follows the company's announcement in April that it plans to expand its Versigard Roofing Systems Division to the United Kingdom, Ireland and Europe.

Birch has worked at Goodyear for four years. His last position was marketing specialist investigating the Division's expansion. Birch also has extensive roofing experience, which began when he was a student in high school.

H.B. Fuller names new division manager

Maynard Kelsey has been named division manager for the H.B. Fuller Co.'s Foster Products Division. His duties will include overseeing all division operations, including sales, marketing, product research and manufacturing.

Since 1981, Kelsey has been technical director for non-aqueous systems at the company's Willow Lake Research Center. He joined H.B. Fuller in 1966 as a chemist, becoming the department head for the company's waterbase and solvent cement laboratories. He has also served as technical director for the Assembly Products Division and as manager for the company's Grand Rapids, Mich., and South San Francisco plants.

GAF names Watenpool year's top sales manager

The GAF Corp. has named Ronald W. Watenpool District Sales Manager of the Year. As district sales manager of the Building Products Division at GAF's Mt. Vernon, Ind., plant, Watenpool led his division to record-setting sales levels.

Watenpool supervises sales support for the GAF Building Materials Divisions in Indiana, Illinois, Ohio, Kentucky, Tennessee, Mississippi, Kansas and some counties in other states. He is responsible for overseeing the work of 10 territorial sales managers and ensuring that quotas are met. Watenpool was a leader in the introduction of two new products, Ruberoid Modified Bitumen and GAF Packaged Asphalt.

Armco names new staff; expands builder network

Armco Atlantic, Inc., has appointed a new general manager and senior engineer, and has strengthened its builder network.

Gerald W. Wells is the new general manager for Armco's North and South Central Profit Centers. In 1984, after 14 years with Armco, Wells was appointed general manager of the North Central profit center in St. Louis.

Mark W. Johanningsmeier is the Armco Eastern Profit Center's new senior engineer. Johanningsmeier joined the company in 1980 as an assistant engineer in training. In 1981, he was promoted to associate engineer and in 1983, to engineer.

In addition to these internal appointments, Armco has appointed a record 125 new builders during the past five months. These new builders join a nationwide distribution network of 450 Armco builders and 350 Atlantic builders.

Riechel & Drews signs with Owens-Corning

Riechel & Drews, Inc., has signed a contract with Owens-Corning Fiberglas to rebuild portions of a modified bitumen membrane production line and mixing system in the Owens-Corning roofing material manufacturing plant in Morehead City, N.C.

This new line will be capable of manufacturing SBS-modified bitumen products in addition to Owens-Corning's existing APP-modified bitumen membranes. It is scheduled for full operation by late summer.

Trustees named to Manville asbestos fund

Six trustees have been chosen to run the Manville Corp.'s \$2.5 billion fund for asbestos victims. The trustees—three lawyers, an investment banker, a consultant and a judge—will direct the distribution of billions of dollars to current and future asbestos victims and will control Manville in about five years, reported *The Wall Street Journal*.

The trustees, who will be paid \$20,000 a year and \$1,000 a meeting, were selected by Manville and representatives for present and future asbestos victims from lists of candidates submitted by each party. Other parties in the case, including representatives for commercial creditors and Manville shareholders, were also allowed to voice their opinions.

The precedent-setting trust, which will hold 50 percent to 80 percent of the company's common stock, is the keystone of Manville's proposed bankruptcy reorganization plan.

When Manville filed for Chapter 11, about 17,000 asbestos lawsuits

were pending. However, epidemiologists now predict that 30,000 to 100,000 lawsuits will eventually be filed against the company.

Roofmaster names Estrada vice president

The Roofmaster Products Co. has named Andranette L. Estrada, better known as Andi, administrative vice president.

"Andi's overall value is in her vast knowledge of roofing products and in the fact that the Roofmaster dealers have successfully looked to her for assistance over the years," said Jimmy Yundt, company president.

Estrada joined Roofmaster in 1974. She has worked for the company as office manager for several years, coordinating customer service and bookkeeping. In 1984, her duties expanded to include working trade shows and outside sales.

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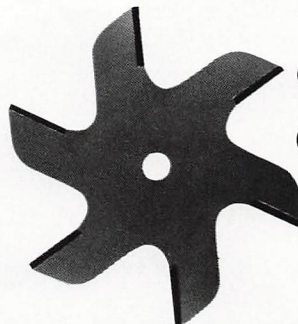


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Check #24 on Reader Service Card

Koppers establishes telemarketing unit

The Koppers Co., Inc., Building Products Division has established a central marketing department in Pittsburgh to provide quicker, more effective response to customer sales and service for the company's roofing and insulation products.

By calling the new marketing department at 800/558-2706, customers can receive quick quotations, assistance on specifications, and information on product availability and delivery.

MM Systems names Segin Phoenix branch manager

The MM Systems Corp. has named Don Segin Western regional sales manager for the company's new branch office in Phoenix. He will be

responsible for sales and the future distribution of MM products for the West, which will include the addition of distribution centers.

Segin has been involved in architectural sales of commercial and industrial exterior building products for 20 years. Formerly he worked for the National Architectural Supply Co. in Phoenix.

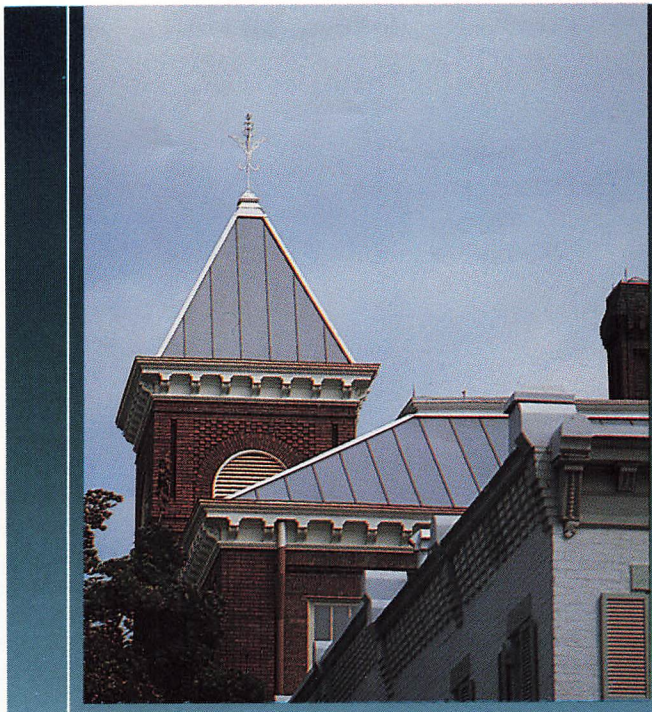
Bird announces profits; launches new division

Bird, Inc., announced profits in all its divisions for the first quarter of 1986 and predicted a continued strong second quarter. The company has also opened a new Environmental Systems Division, making Bird the first liquid/solid separation equipment manufacturer to market mobile rigs for industrial waste cleanup, announced George J. Haufler, Bird chairman and chief executive officer, at a recent shareholders meeting.

Shareholders viewed "A Salute to Norwood," an audiovisual presentation detailing the turnaround of the Northeast Roofing Division plant in Norwood, Mass. Haufler hailed the division as "a business that helped lead Bird back to profitability." This is the Roofing Division's first profitable first quarter in six years, Haufler said.

Also at the meeting, Haufler presented the first annual Bird Heritage Award to Richard C. Maloof, who was recently elected corporate vice president and general manager of the Northeast Roofing Division. This award recognizes outstanding performance in what Haufler calls "the nearly two-century-old Bird tradition of excellence."

In addition, Bird stockholders re-elected Charles S. Bird Jr., Robert L. Cooper and Mary Bird Phillips to the Board of Directors. Their terms will expire in 1989.



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Check #22 on Reader Service Card

Tulsa contractors establish association

Cliff Johnson of Empire Roofing and Insulation of Tulsa has been elected president of the newly formed Tulsa Area Roofing Contractors Association (TARCA).

TARCA was formed by several major Tulsa roofing companies in an effort to keep roofing contractors, architects and engineers in the Tulsa area abreast of the many industry changes that have occurred in recent years.

Other TARCA officers include: vice president, Junior Beaver of Action Roofing, Broken Arrow; and treasurer, Les Dickson of Dickson Roofing, Inc., Tulsa. TARCA's directors are: Dee Suttle of Suttle Roofing Co., Jim Turner of Turner Roofing & Sheet Metal Co., Dave Stanley of Sequoyah Roofing, and Claude Krebs of Commercial Roofing, Inc.

To obtain more information about TARCA, write P.O. Box 211, Tulsa,

Okla. 74101 or contact any of the Association's officers or directors.

FRSA surprises abound

The Florida Roofing Sheet Metal & Air Conditioning Association's (FRSA) 64th Annual Convention took attendees into the future when its trade show took on an international flair. A new industry-wide educational program was revealed and the Association's new officers were announced at the meeting as well. The Convention was held at the Tampa Hyatt in June.

The FRSA trade show attracted registrants from Japan and New Zealand. The Hissan Trading Co. of Tokyo, Japan's major construction industry products supplier, sent its manager of construction materials, S. Shizukuda, to the show on a fact-finding/buying mission. Shizukuda showed keen interest in importing state-of-the-art American roofing equipment and supplies to Japan in order to improve


the country's products and applications technology. Hissan Trading's U.S. offices operate under the name of International HTC, Inc.

Tony Tusa, manager of Broadway Sheetmetals, Ltd., of New Zealand, manufacturers of ducting for ventilation and air conditioning systems, also visited the trade show. Tusa was interested in new developments in duct joint sealing and automation.

Officers for 1986-87 were announced at the Convention's business luncheon. Brad Bowen Jr. of Bowen & Sons, Inc., Sebring, was elected president. Bowen has been active in FRSA affairs for 13 years. Other officers elected were Glenn R. Warren of Tack & Warren, Inc., Clearwater, as chairman of the Board; George Ferber of Ferber Sheet Metal Works, Inc., Jacksonville, as president-elect; Morris Swope of the Tampa Roofing Co., Tampa, as vice president; and Ken Boysen of Boysen Sheet Metal, Pensacola, as secretary-treasurer.

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Identifying markets key to success in reroofing

Marketing reroofing requires almost as much hard work as the reroofing itself. At Young Sales Corp., we spend a lot of time preparing for, making and following up on sales calls. It's part of the company's strategy to "develop" customers, the term we use to describe our efforts to assess and satisfy the client's needs.

Developing customers should be the first step in any company's marketing plan. It involves identifying potential clients, letting them know about the company's services and reputation, and learning about their needs and expectations. Successful sales calls do not happen by chance. They take a lot of preparation, the ability to listen to the customer, and a presentation that will create the image of professionalism and trustworthiness.

Identifying potential customers

The most efficient way for a sales force to develop customers is by targeting the people most in need of roof maintenance or replacement and concentrating the company's marketing efforts on this audience. Most companies will have to conduct at least some of the research required to identify target audiences, using the phone or mail to survey potential clients. However, some of this market research may already have been done by architects, manufacturers and suppliers interested in assessing the area's roofing needs. If the results of these studies are available, it would be well worth the contractor's time to obtain copies. Another source of local market information might be the Chamber of Commerce.

There are also directories available that provide information about companies in specific categories. One directory in Young Sales' offices, for instance, lists every shopping center in the Midwest. Another lists all businesses in Missouri.

Through experience and research Young Sales has determined several target audiences, including homeowners, plant engineers, maintenance managers and supervisors, shopping center developers and managers, and school board presidents

Satisfying customers Young's goal

by Jim Gentry

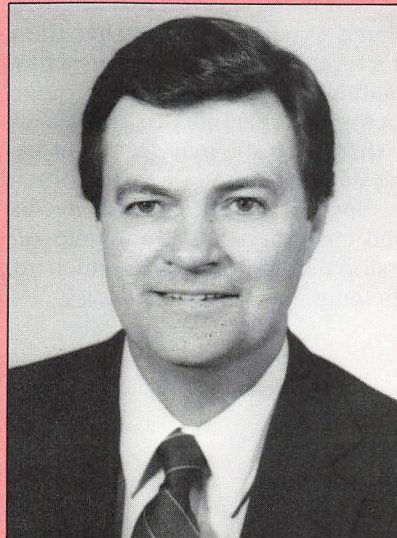
and superintendents. We believe these are the people making the roofing decisions for their organizations, and the ones most likely to be influenced by our marketing efforts.

Young Sales employs many different tools to reach these potential customers and generate sales leads. The company has placed ads in local newspapers, trade magazines and the Yellow Pages of the telephone directory. It has also conducted mail and telephone campaigns and has made arrangements with organizations such as the Construction Specifications Institute (CSI) to have Young Sales fliers included in the local chapters' mailings.

Young Sales calling

Advertisements, fliers and phone campaigns have their place in Young Sales' marketing strategy; however, none of these methods has been as successful in generating interest in the company's services as calling on potential clients in person. Although calling on new business for the first time may be intimidating to a sales person, these "cold calls" have often turned into good prospects when they are handled properly.

We have found that preparation is the key to any sales call's success. Our sales



Jim Gentry is division manager for the Young Roofing Co., which deals almost exclusively in reroofing applications. Young Roofing is a division of Young Sales Corp.

***We have found
that preparation
is the key to any
sales call's success.***

people try to discover as much as they can about potential clients' operations and roofing needs before they walk into their offices. During their research, the sales staff tries to answer questions such as:

- the customer's type of business, when the company was established and its present financial status;
- the length of time the customer has been a tenant in the building;
- the name of the person who makes the roofing decisions for the company;
- any unusual features of the roof that may affect future maintenance or replacement jobs; and
- the existence of any past maintenance programs and the customer's satisfaction with them.



Any information the salesperson is able to obtain is incorporated into the sales presentation. I believe it shows a sense of professionalism when the salesperson does his homework and can tailor the sales message to the prospect's specific situation. A first-class presentation will use all of the tools that Young Sales makes available, including company brochures, photographs, a diagram of the roofing project and any specific flashings, walls or curbs.

The presentation that I have developed focuses on Young Sales' background and the different types of reroofing jobs the company has completed. During the presentation, it is emphasized that Young Sales does have experience reroofing the customer's type of building. The presentation also highlights the company's reputation, experience and reliability to assure the customer that he or she may feel comfortable dealing with us. Some of the information that is supplied includes a reference list of satisfied customers and the names of the professional organizations to which Young Sales belongs.

Young Sales recently produced an audio-visual program that includes much of this information. The program, which is about 20 minutes long, tells the customer about the company and the roofing systems it installs. It also describes the company's maintenance survey program and services such as metal roofing and siding installation, and building restoration. The program is available in videocassette or slide format.

Often during a discussion with a potential client, questions of cost and warranties may come up. At Young Sales we stress that the cost of the roofing is not the only issue that should be considered. We point out to the customer that the price of a properly installed roof may be spread out over 10 or 20 years. During discussions about roof warranties, our sales people explain the difference between the manufacturer's warranty and Young Sales' warranty. This makes the customer aware of the fact that it is the manufacturer rather than Young Sales that is responsible for the 10- or 20-year warranty that is being offered.

Inspection is next step

Once the potential customer has learned about the company and its services, he or she may request a roof inspection. Our staff starts with a visual inspection and then takes several test cuts to determine the condition of the existing roof.

Many steps must be completed to properly evaluate a roof's condition and assess the extent and cost of the work that must be done. The roof survey must determine roof dimensions, the number of systems in place, the origin of any leaks, undesirable conditions such as ponded water, and the moisture damage the existing systems have suffered. Sometimes, when it is difficult to determine the extent of moisture trapped within a roof system, a moisture survey may be conducted. During the visual survey, all roof components are also inspected, including the surface; membrane; parapets; insulation; penetrations; drains, gutters and downspouts; ballast; and base and counterflashings.

By thinking ahead, our roof inspector may also answer any questions that might arise during any future roofing work. Noting the access routes to the roof as well as the space that is available for equipment on the ground during the initial inspection makes it possible to plan for awkward situations. Locating penthouses and drains is also important should it be necessary to estimate a tapered roof system or install a cricket through valley areas.

All of the information gathered during the survey is noted in a full report prepared for the building owner. In this report, the owner is told the condition of the roof and the actions Young Sales recommends to improve the roof's condition as well as the specifications, application methods, and warranties that pertain to the proposed roofing work and a date of completion for the job.

Our answer is YES

In some cases, after the initial visual inspection is made, we find that a maintenance program is needed to keep the roof

in good condition. Our YES (Young Evaluation Survey) program offers planned, periodic, professional inspections that help owners control their roofing costs.

A free roofing evaluation is offered as part of the YES program. Then, using the YES survey, we tailor a one- to five-year maintenance schedule that lets the customer budget roofing costs over the duration of the contract. Maintenance services include annual or biannual inspections, routine repairs and comprehensive reports on the overall condition of the roof system.

At Young Sales we stress that the cost of the roofing is not the only issue that should be considered.

Young Sales supplies its inspectors with this checklist to help them note roof-top items that need attention.



Young Sales Corp.
1054 Center Industrial Drive
St. Louis, Missouri 63110
771-3080

YES Program
Roof Evaluation Service
Check List

Answers to the following questions will act as a check list for the Inspector to assemble necessary data and remind him of what he has seen prior to his top-side inspection of the roofing system.

Building _____ Date _____

Location _____

Owner _____ Reported by _____

1. Preliminary Information

- 1.1 Plans and Specifications Available: Yes _____ No _____
- 1.2 Age of Roof: Years _____
Original Roof: Yes _____ No _____
- 1.3 Recent Leaks _____
or Long History of Leaks _____
- 1.4 Building Use Changed: Past _____ Future _____
- 1.5 Retrofit Considered: _____
- 1.6 Type of Roofing System:
Asphalt _____ Coal Tar Pitch _____
Single Ply _____

2. Underside Inspection

- 2.1 Building Settlement: Yes _____ No _____
- 2.2 Wall Cracks: Yes _____ No _____
- 2.3 Water Stains: Yes _____ No _____
- 2.4 Structure Presently Sound: Yes _____ No _____
- 2.5 Structure Can Support
Additional Roof: Yes _____ No _____
- 2.6 Deck Needs Repair: Yes _____ No _____

3. Topside or Roof Inspection

Upon inspection of the roofing system, indicate in the appropriate column what action is required to return each segment of the roofing system to serviceable condition.

	Action Needed Total Replacement	Partial Replacement	Complete Recover
3.1 Parapets & Fire Walls	_____	_____	_____
3.2 Base Flashings	_____	_____	_____
3.3 Counter Flashings	_____	_____	_____
3.4 Roof Edges	_____	_____	_____
3.5 Drains	_____	_____	_____
3.6 Expansion Joints & Covers	_____	_____	_____
3.7 Surfacing	_____	_____	_____
3.8 Membrane	_____	_____	_____
3.9 Blisters & Splits	_____	_____	_____
3.10 Insulation	_____	_____	_____
3.11 Vapor Retarder	_____	_____	_____
3.12 Deck	_____	_____	_____
3.13 Structural System	_____	_____	_____
3.14 Economically Feasible	_____	_____	_____
3.15 Pond & Water	_____	_____	_____
TOTALS	_____	_____	_____

CORE SAMPLE INFORMATION _____

I frequently look to the sales force for ideas and suggestions that may be developed into new goals for the company.

Young Sales' Jim Gentry (left) explains to a building owner the rooftop conditions that were found during an inspection.

A 24-hour hotline phone number is also provided to allow the customer to contact Young's emergency repair crew during evenings or weekends.

All of the programs and services I have mentioned are part of Young Sales' effort to develop our customers. It's really not a complicated strategy, it's simply our way of treating the customer the way we would like to be treated. We hope that by offering our services with an attitude of helpfulness and concern, we will be able to build a strong relationship with the customer so that he will trust our ability to satisfy his needs.

An objective strategy

Young Sales' marketing plan doesn't stop with developing customers, however. We believe that it is just as important to develop our sales force. As part of this effort, we establish goals and objectives to guide our marketing strategy. Most of our goals seek long-range results. We might, for instance, commit ourselves to expanding the company's services in a new geographic area, or increasing the number of bids on shopping center work. Our objectives seek short-range, specific results. Through our objectives we might commit ourselves over the next year to a certain number of shopping center bids or new jobs in a specific geographic area.

I frequently look to the sales force for ideas and suggestions that may be developed into new goals for the company. To generate these ideas, I have sent letters to the sales people asking them to give some thought to our marketing program, and

listing specific goals and objectives as examples. At the sales meeting following these letters, the sales people's ideas are discussed, and some are chosen to become company goals and objectives.

Other methods we have used to develop our sales force involve membership in local and national construction organizations. Local chapter membership in organizations such as CSI or the Building Owners and Managers Association have given our sales people valuable contacts. Through our membership in NRCA we have been able to obtain the results of product studies such as Project Pinpoint. This information has given us the knowledge we need to choose the right specification and material for our customers' systems.

Giving our sales people the tools they need to do their jobs is also important. I believe Young Sales has developed the best sales tools available. These include attractive and informative company brochures, our audiovisual presentation and a loose-leaf binder with inserts to use when presenting larger proposals. I have also sent letters to the sales people giving them selling tips and marketing suggestions, and updating them on the sales tools available from the company. Young Sales is also in the process of developing a formal motivational program for the sales force.

One other asset the sales force can bank on is Young Sales' reputation. Because we are known as a company that is committed to doing the best possible job for the customer, much of the groundwork for a successful business relationship has already been laid.



Industry still concentrating on reroofing market

You won't find the category "Reroofing Contractor" listed in the Yellow Pages, but if Mike Promen of Clark Roofing Co. in Broadview, Ill., has his way, you will soon. Promen, who claims that 99.9 percent of his business is negotiated reroofing, believes that classifying the company by its specialty would be a smart marketing move. The Chicago contractor has found that reroofing provides more lucrative business than any other service.

Historically, reroofing jobs constituted roughly 50 percent of a contractor's business. However, the aging of structures built during the boom of the 1970s and an unsteady economy have combined to thrust reroofing into the forefront of many contractors' operations.

According to a 1985 *Roofing Spec* survey, reroofing accounted for 59 percent of the respondents' business, and brought in 62.4 percent of their profits. Most of this business was commercial/industrial work.

Most contractors surveyed believed reroofing could become an even more important part of their business. They predicted that reroofing will represent 62.5 percent of their revenue this year. So far, their forecast has proven accurate.

"Well over 60 percent of our business this year has been reroofing," says James L. Dahill, marketing director of F.J. Dahill Co., Inc., New Haven, Conn. "And more than 60 percent of that was single-ply."

Why reroof?

There are many reasons why the industry is experiencing a reroofing boom, according to the contractors we talked to. Gaylord Blue of Blue's Roofing Co., San Jose, Calif., attributes most of his reroofing contracts to the 1970s building boom. Too many buildings were constructed, he says, without tenants to fill them. As a result, these buildings haven't received the attention they might have otherwise. Blue sees continued growth and the potential for greater volume in the reroofing market.

Contractors tell why

by David Impcy

"For a building owner, a reroofing job constitutes his largest single outlay of money, more so than painting or carpeting," explains Blue. "If a building isn't fully occupied, a landlord may not be able to afford reroofing at this time." The result, he adds, is a poor patch job now, followed by the inevitable, and costlier, reroofing job a few years down the road.

Promen credits construction practices introduced during the last decade's building boom as the source of much of his reroofing business. Because oil was so scarce in the 1970s, he says, a cheaper grade of asphalt emerged on the market. And, attempts to conserve energy led people to pile on the insulation, which isolated the roof membranes from the buildings' more moderate temperatures. The roof systems that were built with cheaper asphalt or higher R-values probably won't last 10 years, he says, making them prime candidates for reroofing now.

Promen cites Chicago's unstable political environment as another factor contributing to reroofing's popularity in his area. "The eternal feuding between our city council and Mayor Washington has failed to instill confidence in builders. The political climate is too volatile to accommodate a lot of new building." This uncertainty has led many building owners to opt for "band-aid" solutions on older buildings rather than risk an investment in a new building. "If owners have money," he continues, "they're hanging on to it."

Cal Wessman of Coldwell Banker Commercial Real Estate in Chicago disagrees with Promen's assessment, pointing to soaring building costs as a key reason behind renovation's popularity, at least in Chicago.

Gaylord Blue attributes most of his reroofing contracts to the 1970s building boom.

"There is quite a lot of new building underway in Chicago," he says. "Granted, the money isn't as easy to come by as it was just a couple years ago, but for the most part, when money is available, people are building.

"This has a lot to do with the rise in renovation," he continues. "Many of Chicago's older buildings, like the Prudential, the Equitable and the Merchandise Mart, have recently undergone intensive renovations, including roof work, to combat the attractiveness of new buildings."

Dahill sees building owner's attempts at do-it-yourself roofing as a prime source of reroofing work for his company. The owners often undertake "in-house" repair jobs in the mistaken belief that they will save money. "Unfortunately, this practice results in faulty installments that reflect the building owner's lack of knowledge regarding materials, maintenance, weather, etc.," Dahill says. "Basically, a roofing contractor is trained to recognize and treat the symptoms of an aging roof; a landlord is not." Of course, he quickly adds, weather, rooftop traffic and neglect are still the main reasons why a roofing system will need to be replaced.

There is a dark side to the reroofing market, however. The economy in some places is so bad that even reroofing is no longer an option. Cliff Johnson of Empire Roofing, Tulsa, Okla., says the reroofing industry is suffering in the oil-producing states. According to Johnson, many building owners in the Tulsa area are finding that, with massive layoffs in the oil industry, this is not the most economically feasible time to reroof.

"Since the oil industry is not spending, people are letting their leaks go, or they're opting for patch jobs," Johnson says. Fortunately, Oklahoma's climate allows for year-round roofing, so when jobs are available, they can be attended to promptly.

But even in the oil-producing states, some work may be found as a result of the boom years. There are a number of 10- to 15-year-old buildings in Tulsa that were hastily and inexpensively erected, with roofs that shouldn't have been approved, Johnson says. "These roofs will continue to provide us with plenty of business," he declares.

Reroofing's future

In the rest of the country, the number of reroofing jobs is expected to continue rising, according to the contractors we talked to. When asked to predict reroofing's future, nearly every contractor responded, "excellent."

For Blue, California's building boom virtually guarantees continued reroofing work for the next several years. Promen also sees a strong future for his business.

Wessman, however, predicted that the nation's renovation surge may decline because of certain components of the tax reform package currently before Congress. For years, builders were given tax credits for undertaking historic renovation projects. But, if certain provisions of the bill are enacted, these incentives will be removed. This will undoubtedly have a great impact on the reroofing industry.

Dahill believes his Connecticut company's success will depend as much on its own efforts as on the state of the market. "To be successful," he says, "you must create the need in your marketplace for reroofing, if one doesn't exist already." He credits much of his reroofing business to his company's sound marketing approach, which has been based on the information contained in the *NRCA* marketing manual.

Dahill believes that a proper attitude toward the work and the customers will help ensure prosperity. "Above all," he continues, "if you display professionalism, enthusiasm and a knowledge of your craft, you'll find that you have more reroofing business than you ever thought imaginable."

1001 reasons not to roof over wet insulation

Water is the cancer of any roof, whether it's a built-up, modified bitumen or sheet membrane system.

Water in its "free" or vapor form degrades the roof assembly from the structural deck to the membrane surface. It forms corrosive substances with organic elements in the roofing system that eat away at roof and structural components. Once inside a roof assembly, water can cause long-term deterioration and early roof failure.

When a new roofing system is installed over an existing system that contains water, it can subject the roof and structural system components to long-term moisture exposure, which can result in corrosion and/or rot. This is not to say, however, that every last ounce of moisture must be removed before reroofing can begin. Minor quantities of retained moisture in excess of equilibrium moisture may not significantly contribute to the roofing assembly's decay, depending on the system's insulation and the structural members' susceptibility to moisture. But generally speaking, the typical roof tolerates moisture on its surface much better than moisture vapor from below. For this reason, it is essential for the overall health of the roofing assembly to protect it from the effects of moisture vapor trapped within its components.

This protection from entrapped moisture cannot be achieved with roof vents or breathable roofing membranes. These products have not proven effective in releasing trapped moisture from most overlay roofing systems. The inescapable fact is, when a new roofing assembly is installed over existing wet roof insulation, it usually contributes to the early failure of the recover roof system even in the best of conditions.

No stopping moisture damage

There is little a contractor can do to prevent trapped moisture from moving throughout a roofing system. Moisture vapor is all-pervasive, capable of penetrating the smallest openings in a system's components. Even though roofing membranes are highly impermeable, water

**Even
with
vents,
practice
is
taboo**

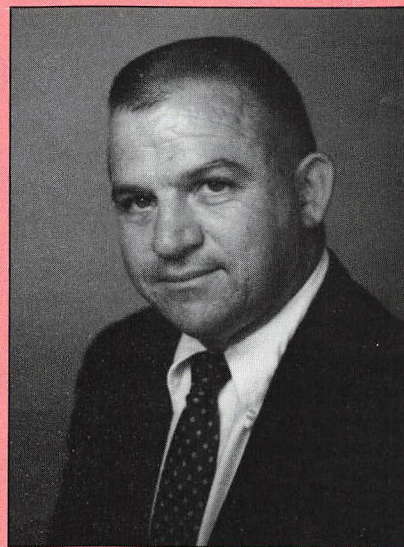
by Dick Baxter

vapor can migrate into or through even the most moisture-resistant materials when there is enough of a difference in vapor pressure between the ambient conditions outside and the building's interior. In recognition of the fact that moisture vapor is extremely difficult to control, the industry recently replaced the term "vapor barrier" with "vapor retarder" in roofing jargon.

Moisture that does not migrate is also dangerous to the roof system. Free water in a roofing assembly can be vaporized by heat on the membrane's surface or from the interior. This causes the water and gas to expand, forcing moisture vapor through the path of least resistance in the roofing assembly. Vapor that is trapped in a confined area can expand with significant force, stretching roof membrane materials and causing separation in the area of encapsulation. This phenomenon is sometimes referred to as "blistering." Blistering is not peculiar to BUR membranes; it may occur beneath impermeable modified bituminous membranes or at laps in sheet membrane systems.

Damage begins with decks

All roof components will suffer some damage if they remain in contact with free water or moisture over an extended length of time. Structural decks, regardless of



Dick Baxter is president of Carolina Roofing Service, Inc., Monroe, N.C., and a one-year vice president of NRCA.

There is little a contractor can do to prevent trapped moisture from moving throughout a roofing system.

their composition, are usually the first building system components to be affected by residual moisture.

Even structural concrete is susceptible to moisture damage. The material conveys the false impression of permanence and is often considered relatively immune to the moisture's effects. But when volumetric changes cause cracks in reinforced concrete, it allows moisture to enter the core of the concrete assembly. Once inside, the water attacks and corrodes the reinforcing steel that gives concrete nearly all of its tensile and shear properties. As the rust causes flaking of the surfaces of the reinforcing steel, the concrete is divorced from the reinforcement and loses some of its structural integrity.

The deterioration of concrete's structural properties will vary significantly depending on concrete mix, quantity of steel and many other factors that are unknown at the time of reroofing. A conservative approach to the problem of moisture trapped over concrete decking is warranted to minimize potential deterioration of structural components. Structural concrete decks are not easily replaced.

Wood decks, even when treated, will eventually decay when continually exposed to wet roofing materials, causing local or general degradation of structural integrity. Continuous exposure to accumulated moisture will cause plywood deck components to delaminate and weaken, and wood plank decking to rot. Wood decking decays from the top down, making it difficult to detect deteriorated decking from the building's interior.

Vapor retarders lying between wood decking and wet insulation will not prevent the deck from deteriorating. In this situation, it is likely that the vapor retarder will fall below the dew point temperature, allowing moisture to accumulate on the bottom side of the vapor retarder and the top of the deck surface.

It is best to check wood decking lying under wet insulation before reroofing. Unless the existing roofing assembly is removed to allow assessment of the existing deck conditions and the needed repairs are made, the new roofing assembly may fall in with the old system as structural decking deteriorates and is unable to support the roof and imposed loads.

Painted steel decking is particularly susceptible to rust caused by continuous contact with wet roof insulation. The steel decking, like wood decking, rusts from the top surface down, making accurate assessment of deck conditions just as difficult from inside the building.

Roof insulation materials that hold water in contact with the steel decking must be removed. The deck must then be treated to retard the rusting action, or replaced or overlaid as required to restore structural integrity to the system. If rust has significantly deteriorated the vertical or bottom flute sections, structural integrity of the steel decking has been compromised and the steel deck sections should be replaced.

Regardless of the type of decking involved, harsh environments will typically accelerate the deterioration of structural components containing unnecessary moisture. Wet roof insulation or wet decks in cold climates are subject to freeze-thaw cycles, which can cause the spalling of cementitious materials and the general breakdown of moisture-sensitive insulation and structural components. High humidity interior environments in very cold winter climates are the most harmful. The potential is great for humidity generated inside the building to



Constant exposure to moisture has severely rusted this metal deck. Before reroofing could begin, it was necessary to install sheet metal between the deck and the new insulation.

Moisture can also affect lightweight aggregate concrete and gypsum roof decks. When wet, these materials are subject to spall damage during periods of extreme weather, reducing the deck's structural integrity and weakening its ability to hold fasteners. The deck's painted metal form material and tees/bulb tees are subject to rust deterioration when continually subjected to wet deck materials. This makes it difficult for these components to support the lightweight deck material and the mechanical loads imposed on the roof assembly. Because of moisture's devastating effects on these materials, areas of wet or damaged lightweight decking and rusted structural components should be removed and replaced prior to installation of the new roofing assembly.

condense and accumulate as moisture in the roofing assembly. Contractors encountering this situation should carefully evaluate the existing roof's condition prior to reroofing.

Dangerous weight gain possible

The weight of the water trapped in the insulation may also put a dangerous strain on the structural members. Free water weighs approximately 5 pounds per square foot per inch (a board foot). Some insulations are capable of absorbing and holding most of this water in each board foot, increasing the structural load by approximately 5 pounds per square foot per inch of insulation. If 2 inches of saturated insulation are contained in the existing roofing assembly, 8 to 10 pounds per square foot of insulation may be added to the structural load. Depending on the building's design live load, the additional weight of the water left in the roofing assembly, when combined with the weight of the recover roofing system, may significantly affect the building's remaining structural safety factor.

When wet insulation adds weight to a roof system, ponding becomes an important consideration. The additional weight may contribute to the permanent deformation of structural members, which can cause further ponding on a low-sloped roof surface. As the ponds grow, more weight is put on the structural system. To prevent the eventual collapse of the roof, wet insulation should be removed from the roofing assembly prior to installation of the new roof system.

Deterioration of existing insulation

Water or moisture can also break down the insulation in which it is trapped, destroying the material's thermal resistance and structural integrity. The water replaces the air or, in the case of polyurethane foam, the freon gas that is the actual insulating element. Without the air or gas, the insulation board becomes ineffective. Studies by the Army Corp of Engineers' Cold Regions Research Engineering Laboratory (CRREL) and the National Bureau of Standards indicate that common rigid board roof insulation can lose up to 80 percent of its insulation value depending on the degree of saturation.

The glass fibers, cellulose fibers, expanded perlite or plastic cells that trap and hold the insulating gases may also be susceptible to water damage. With the exception of polystyrene, the common insulation materials contain organic fillers that degrade on prolonged exposure to moisture or moisture vapor. Some insulations are also capable of holding large quantities of moisture and generating corrosive acids in the roof system. If these materials become saturated with water, the integrity of the insulation board can be compromised. As the insulation structure begins to decay, its insulating efficiency may be seriously and permanently compromised, and its ability to support the roofing membrane may be diminished. Moisture absorption may also destroy the insulation's ability to retain adhesive bonds.

Once the insulation loses its thermal resistance, it reduces the vapor retarder's ability to resist the accumulation of interior-generated moisture in the roofing assembly. Vapor retarders rely on the insulation installed on top of them to maintain a temperature above the dew point. If the insulation becomes saturated and loses its thermal resistance, it will allow the vapor retarder's temperature to drop below the dew point in cold weather. Once the retarder's temperature falls below the dew point, interior moisture can begin to condense and accumulate between the retarder and the deck, causing the decking material to corrode or rot. An overlay roof containing a minimal thickness of insulation will probably not add enough insulation value to improve this situation.

Moisture attacks fasteners

The mechanical fasteners that secure the roofing system to the deck are also vulnerable to moisture, even though mechanical fastener manufacturers have developed a number of coatings to minimize fastener shank corrosion. Often, these coatings are damaged during shipment or installation, allowing retained moisture to attack the fastener shank immediately in any area where the protective coating is not intact. As the accumulated moisture becomes more acidic, the deterioration of the metal components is accelerated. Stainless steel fasteners appear to be the most foolproof means of eliminating shank corrosion, but they are usually relatively soft and are limited in their applications.

Fasteners, as they penetrate a steel deck and interrupt the deck's zinc or paint coating, can make the deck more susceptible to moisture. By exposing the deck's base metal, the fasteners make it possible for the

All roof components will suffer some damage if they remain in contact with free water or moisture over an extended length of time.

It may take 100 years for roof vents working alone to completely dry out most insulations.

deck to rust out at the point of penetration, compromising the deck's holding power. When the holding power is lost, fasteners can no longer secure the roofing assembly.

The metal plates some fastening systems use to improve wind uplift performance can also corrode. If the area on the plate around the fastener head rusts away, the uplift resistance of the fastening system is reduced to nil and positive attachment of the roof assembly will not be possible. In some fastening systems this problem is avoided by the use of plastic plates that are not susceptible to corrosion.

New roofing in danger, too

Retained moisture can be as damaging to a new roofing system installed over wet materials as it is to the existing system. In general, no roofing membrane presently in use is immune to the effects of moisture accumulation. If the overlay system contains insulation, it will certainly experience the same damage that accumulated moisture causes in existing insulation. Bituminous waterproofing materials will suffer accelerated deterioration if exposed to moisture. Adhesives used to bond rubber sheets may fail when affected by moisture in its vapor form, causing delamination of the field and factory laps. And some PVC plasticizers may leach out when exposed to moisture trapped within the roof assembly.

Can vents help dry insulation?

Roof vent manufacturers and suppliers have claimed that their products are effective in drying out existing wet insulation. At one time, it was advertised that the use of vents eliminated BUR membrane blistering, a concept that has generally been proven false. "One-way" and "solar-powered" vents have also proven to be of limited value in drying out existing wet insulation. Despite the manufacturer's claims, roof vents are not likely to significantly reduce retained moisture—especially if the source of infiltration has not been definitely located and eliminated. Even if an effective roof vent were developed, it still would not be able to improve the integrity of the rigid insulation board, which could have been significantly compromised by prolonged moisture exposure.

CRREL studied the effectiveness of roof vents on different types of roofing assemblies, including various types of rigid board roof insulation. In a report on the test results, CRREL's Wayne Tobiasson said a vapor retarder may affect the drying of existing wet insulation. "However," he added, "there is little evidence to indicate

that edge vents or breather vents can dry out wet insulation" with or without a vapor retarder in the system.

"Since it is extremely difficult to dry wet insulation trapped between a membrane and a vapor retarder," Tobiasson continued, "it is critically important to install the insulation dry and prevent it from getting wet during its service life."

It may take 100 years for roof vents working alone to completely dry out most insulations, according to Tobiasson. He did determine, however, that free water could be pumped from fibrous glass insulation, and the residual moisture essentially eliminated after a period of eight to 10 years. In any case, however, the time frames involved are long enough to allow the significant corrosion of the metal and decay of other structural components.

The consensus among the industry is that wet insulation should be removed prior to a new roof system's installation, and that roof vents will not provide sufficient drying of existing wet roof insulation before other serious system complications arise.

The one common denominator in the deterioration of all roof system and structural components is the unnecessary accumulation and retention of water. If wet materials are not removed prior to the installation of a new roofing system, the moisture retained in the existing roof system will affect the performance of the new roofing assembly and the condition of the structural substrate supporting the roof systems.

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Years of work went into making of *Quality Control*

Toby Nadel, in the May 1986 issue of *Roofing Spec*, suggests that NRCA's *Quality Control in the Application of Built-Up Roofing* increases the tolerances for interply bitumen poundages because "hot" roofing contractors wanted to increase competitiveness by relaxing quality. Carl Cash, in *RSI* magazine, May 1986, is quoted as saying that the document is "self-serving to the roofer. It's another attempt to avoid standards and responsibility." A number of manufacturers have refused to endorse the document primarily because of the interply tolerance issue. As can be seen by these comments, the document seems to have attracted the usual complement of backbiters intent on improving their image by destroying *Quality Control's*.

Contrary to what the critics claim, *Quality Control* is the result of a long and carefully thought out process. The seeds for this document were planted 10 years ago when NRCA's Specifications Review Committee determined after reviewing manufacturers' manuals that no built-up roofing tolerances existed. Instead, the manuals simply specified interply bitumen poundages that ranged from 20 to 30 pounds per square with the understanding that variations would occur.

In response to criticism about this shortcoming, the manufacturers later established 15 percent as the allowable variance, a figure that would yield about 17 pounds of bitumen at the low end. No one really questioned whether this tolerance was being attained or even if it was attainable in the field.

EVT makes first real difference

The real change in the way we viewed the question of interply poundages came when the equiviscous temperature (EVT) concept was introduced. The concept was the industry's first recognition that to obtain proper interply bitumen weights the viscosity of the bitumen must be controlled. The EVT concept controls this viscosity by controlling the bitumen's application temperature; the hotter the

bitumen, the lighter the mopping. Through laboratory tests, mean application temperatures were established for various bitumens that would yield moppings that weighed essentially the same as the poundages listed in the manufacturers' manuals.

The entire industry has accepted the EVT concept as the proper way to control the heating and application rates of bitumen. It is now generally required that material be heated and applied within a range of 25 degrees above or below the product's established EVT.

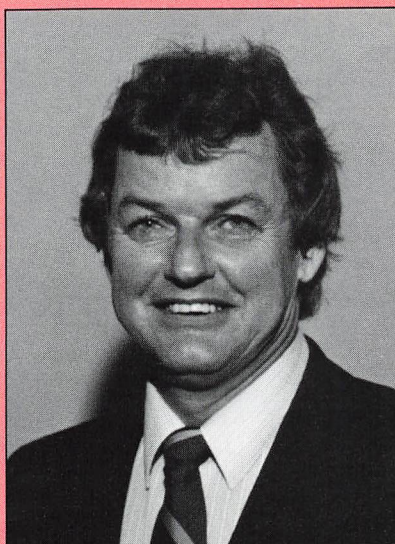
Weight of roll must be considered

Another factor that affects the amount of interply bitumen that is applied is the weight of the roll of felt being laid into it. Because bitumen at its equiviscous temperature is essentially a liquid, the felt will displace a certain amount of material to the side and the front as it's rolled out. If bitumen viscosity is kept constant, more of it will be displaced when the roll is heavier. For this reason, light moppings can be expected at the beginning of a roll and heavier moppings at the end.

When we were developing *Quality Control* we decided to test the relationship between roll weight and interply bitumen weight. During the tests, we laid felt rolls of

A response to document's critics

by Jack Williams



Jack Williams is president of Twin City Roofing, Inc., in Wabpeton, N.D.

Several factors can produce wide variances even on a roof applied under ideal conditions.

Application tolerances take into account the many factors that affect bitumen application, including the cooling rate of the bitumen and the varying weight of the felt roll.

varying weights in bitumen that had been heated to its EVT according to normal roofing practice. Sufficient bitumen was applied to produce a "wave" in front of the roll, indicating that bitumen displacement was occurring. After the felts were installed, samples were cut and weighed.

This study found that bitumen weights in the samples ranged from 17 pounds at the beginning of the roll to 28 pounds at the end. The average interply weight was 23 pounds, which is approximately the weight specified by most manufacturers.

Other tests were run using the same procedure, except that this time the felts were lightly broomed. This light brooming reduced the interply poundages by another 10 percent.

From this study it became clear that the manufacturers' established weights were attainable on the average. However, it also indicated that several factors could produce wide variances even on a roof applied under ideal conditions. What if in the field, for instance, the test cut occurs at a point where a new heavy roll of felt was rolled in? Or the bitumen is applied at a temperature 25 degrees higher than the published EVT? Or the inspector on duty requires heavy broom-

ing? Because entire roofs could be rejected on the evidence of a single test cut, it was clear that tolerances must be established that could accommodate variances caused by the physical restraints imposed on the workmen such as the EVT, roll weights and required brooming. It was obviously necessary to establish tolerances that could be attained in the field. Unattainable tolerances are not tolerances.

Reducing the effect of roll weight

There are other installation methods that eliminate the problems associated with varying roll weights. One is the practice of cutting felts into shorter lengths, which is called "flysheeting." Most manufacturers don't recommend this practice, however, except for certain cap sheet installations.

Another method involves the use of a feltlayer. Because the felt roll is carried on a machine, it does not come in contact with the bitumen. This keeps displacement to a minimum and allows a greater amount of bitumen to be applied. Feltlayers can only be used on certain large roofs, however.



The vast majority of roofs continue to be applied with the roll in contact with the bitumen.

It is also possible to hand-mop bitumen, which results in a low rate of application. The mop is "scrubbed" in a technique similar to painting. However, any contractor attempting to retire to Florida with the money saved on asphalt using this method will need a back brace for the rest of his life. This process is very difficult. In recognition of the practice of scrubbing, NRCA recommends that bitumen be applied in sufficient quantities to produce a wave in front of the roll. No more bitumen can be applied.

Other causes of variance

Another cause of variances in interply bitumen weights is the cooling of the bitumen during the few seconds between the mopping and contact with the felt. This can occur even if the bitumen is applied at the proper EVT. When roofs are applied during windy or cold conditions, bitumen cooling can result in heavier moppings even if the best workmanship is practiced.

Some manufacturers' conflicting requirements create variances when they require contractors to attain higher interply bitumen weights with bitumen applied at the proper EVT. One glass felt manufacturer originally required 30 pounds of bitumen between plies, a requirement that was later lowered to 25 pounds. This manufacturer complains of the wide variances it finds in the test cuts submitted under its quality control program. Although the company ascribes the problem to workmanship, it's obvious that the variations occur because of changes in the bitumen's viscosity and the effect of roll weights on the application rate. The only way their required interply bitumen weights can be attained in a conventional mopped application is by applying bitumen at a lower temperature. Because the manufacturer requires the bitumen to be applied at the proper EVT, their requirements for interply bitumen poundage are impossible to attain. Perhaps this is why the company is reluctant to endorse *Quality Control*.

Other tolerance levels

The variations that can occur during the application of surfacing bitumen and aggregate also had to be taken into account when the tolerances for these components were established. Tests were conducted to determine surfacing bitumen weights and the weights of varying sizes of aggregate. Once again, we found that the viscosity of the bitumen was the controlling factor. Variations in the bitumen's application weight were noted between the beginning and end of the graveling run, as the bitumen cooled and the level of gravel in the cart was reduced. *Quality Control's* 25 percent tolerance level was established as a result of these tests.

Incidentally, because our tests indicated variances in aggregate quantity due to the size of the aggregate, the revised *NRCA Roofing & Waterproofing Manual* recommended that the amount of aggregate surfacing should be increased from 400 pounds to 500 pounds. This, of course, was "self-serving" and made us more "competitive."

Quality Control is fact of life

Quality Control was resisted by certain contractors. It's interesting to note that these contractors were journeymen roofers at one time who recognized that variances can occur when roofs are installed in different weather conditions. I sympathized with their reluctance, but the fact remained that the contractor was being confronted by testing labs and agencies, manufacturers, and architects who believed they knew how the contractor should perform even though they had never installed a roof and were not aware of the variables.

The supporters of *Quality Control* recognized that we were going to be examined anyway. They decided that if anyone should write a manual of quality control, it should be someone familiar with the product.

The industry now has *Quality Control* before it. The backbiters can question it to their heart's content, just like they did the Preliminary Performance Criteria. They can question the veracity of its authors, accuse them of venality or worse, but the fact remains: here is the first document ever written telling us how we should measure and grade roof installations. It probably could have been done better, but it stands as the first and only document of its kind. And NRCA should be proud of it.

Here is the first document ever written telling us how we should measure and grade roof installations.

CONTINENTAL
ROOFING COM



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**Eliminate
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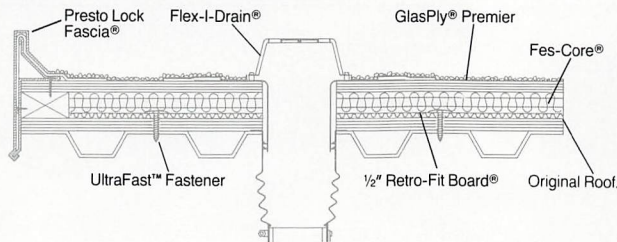
Long-lasting, problem-free performance is what you want from the roofs you install. And that's what you receive from a Manville roofing system. Whether it's a built-up, modified bitumen, or single-ply membrane.

Manville supplies all three major types of roofing systems. That means you enjoy the time-saving convenience of having just one supplier for everything that goes into the roofing system. Including insulation, fasteners, accessories and, of course, the membrane. Products that are selected for compatibility and performance means no more spending endless hours ordering roof components from many suppliers and fewer callbacks.

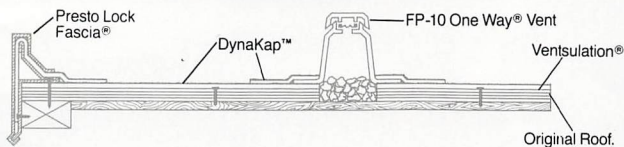
A roofing system's primary job is to protect what's under it. That's why Manville never compromises on quality. Why we invest so much in research and development to bring you the best in roofing systems, specifications and application techniques. Why we provide technical assistance from an experienced staff of roofing specialists. Why Manville's guarantee program is written to provide double protection—a guaranteed guarantee that provides unmatched coverage plus single-source responsibility for the entire roofing system.

Selecting and installing the right roofing system can be easy and worry-free. When it's a Manville roofing system. For information, call (303) 978-4900. For export, telex 454404 JOHNMANVL DVR.

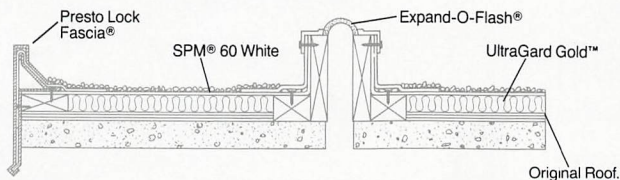
BUILT-UP ROOFING SYSTEM



MODIFIED BITUMEN ROOFING SYSTEM



SINGLE PLY ROOFING SYSTEM



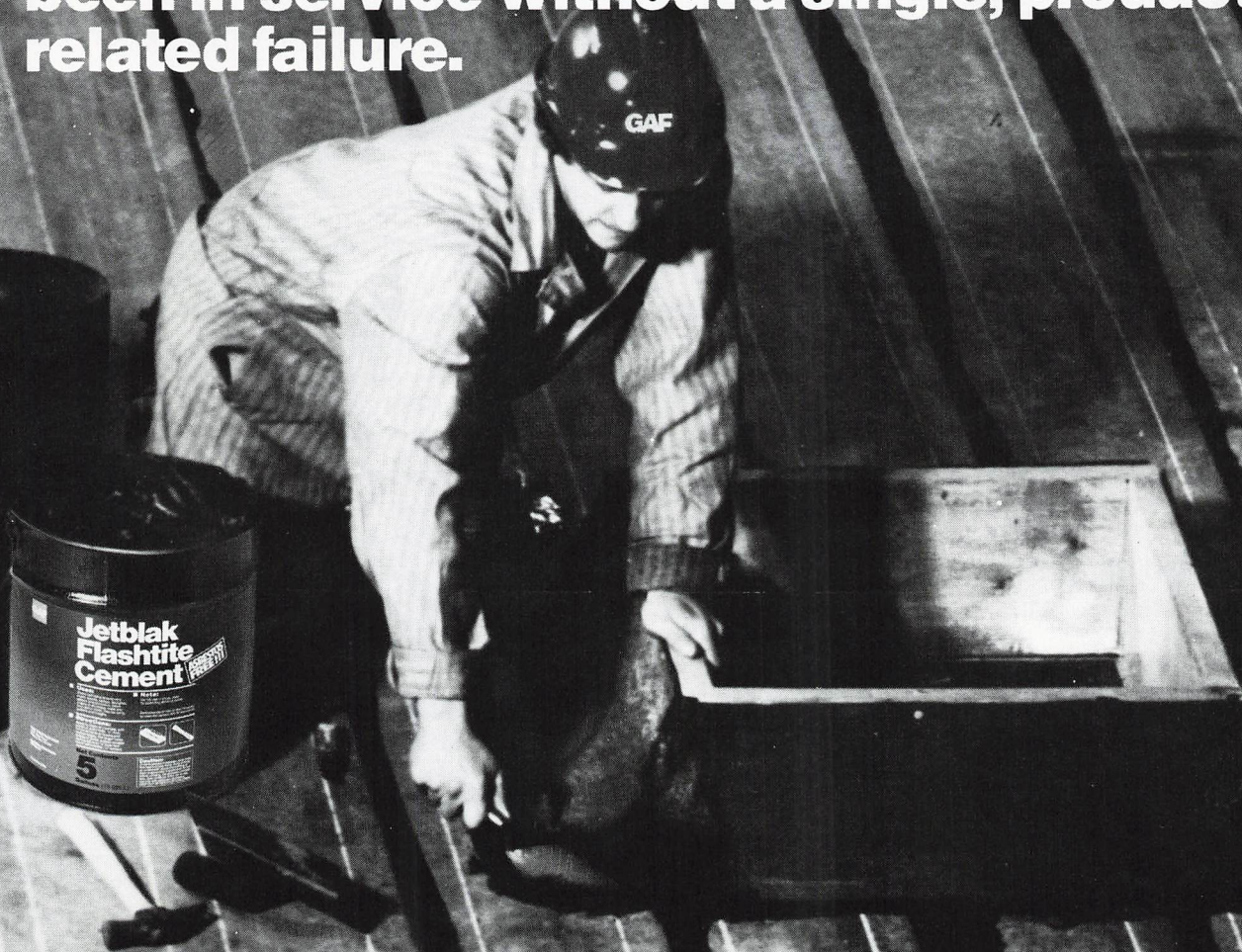
**21,000 people with one goal:
To be your best supplier.**

Manville

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30,000,000

times the 10 seconds it takes to read this page is how long efficient, easy-to-apply **GAFGLAS** Built-Up Roofing Systems have been in service without a single, product-related failure.



GAF **Super**
System
THE BEST OF
THE BEST

GAF Corporation, Building Products Division, 1361 Alps Road, Wayne, New Jersey 07470.
For details, see Sweet's Catalog Reference Numbers 7:1 Gaf and 7:15 Gaf.

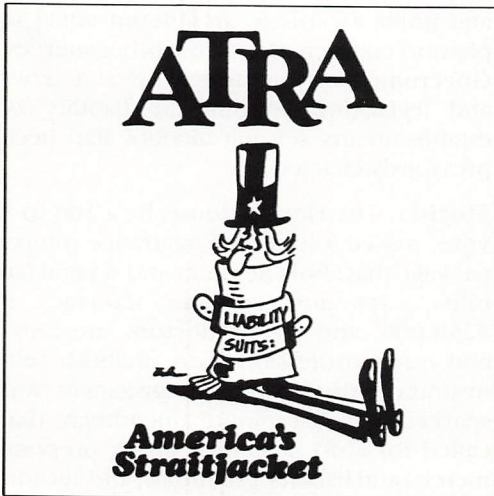
EBUR

Check # 11 on Reader Service Card

More than 16 million civil lawsuits were filed in U.S. state courts in 1984, while Japan had only 160,000.

In 1963, there were only two settlements for a million dollars in the United States. Last year, there were nearly 500.

In an area of liability particularly interesting to roofing contractors—asbestos-related lawsuits—63 percent of the awards go toward legal expenses, while only 37 percent ever finds its way into a victim's pocket.



It was facts like these that convinced NRCA, through its subsidiary, the National Roofing Legal Resource Center (NRLRC), to join the American Tort Reform Association (ATRA). Formed in January 1986, ATRA is a broad-based coalition devoted solely to fighting the liability crisis, reforming the civil justice system and fostering insurance availability.

"Our generation has overturned 200 years of legal tradition," testified ATRA president James K. Coyne before the House Subcommittee on Commerce, Transportation and Tourism in May. "Individuals who are injured by the fault of others should have access to the legal system and should be fairly and quickly compensated, but those goals are not being met because of

the unpredictable, expensive and time-consuming 'lottery' which is the tort system today."

"Moreover," continued Coyne, "the high costs created by the tort system are being passed on directly or indirectly to all our nation's citizens. As a result of spiraling costs, access to needed services and activities is being restricted or is in danger of being restricted as insurance becomes prohibitively expensive or is eliminated."

To combat the insurance crisis, ATRA has developed the following three-pronged attack:

- **Model legislation**—ATRA, in close liaison with leading state legislators, will develop and provide a package of model reform proposals for state legislatures, where liability is the major issue across the country. ATRA will also supply model testimony to those fighting for tort reform before legislatures.
- **Washington action**—ATRA is the organizer of a 1986 White House conference on the liability crisis. ATRA members will provide information to key federal civil justice reform proponents through other conferences and seminars, liaison with the Attorney General's Tort Reform Policy Group and congressional testimony and briefings.
- **Public awareness**—ATRA works to educate key national, state and local organizations, as well as the public, on how the liability crisis hurts all Americans, and how the crisis must be resolved.

In joining ATRA, NRLRC joins more than 150 organizations committed to tort reform and the resolution of the liability crisis. ATRA's members include many professional organizations and trade associations, representing nearly 1 million businesses, professionals, schools, communities, partnerships, public utilities and consumers.

As a member in good standing, NRLRC will receive ATRA's newsletter, *The Reformer*, as well as other information intended to keep members abreast of the situation. NRLRC members may be called upon to testify or speak on how the tort/liability crisis pertains to their particular industry.

**NRCA's
Legal
Resource
Center
joins
ATRA**

Tort reform laws sweep nation

States passing or considering legislation intended to curb civil court abuses.

In just seven months, the American Tort Reform Association (ATRA) has influenced lawmakers throughout the country to draft legislation intended to curb civil court abuses and regulate insurers. The broad-based coalition, which NRCA has recently joined, has been lobbying for civil reforms since January.

The following is a brief summary of tort reform activity in several states compiled by ATRA:

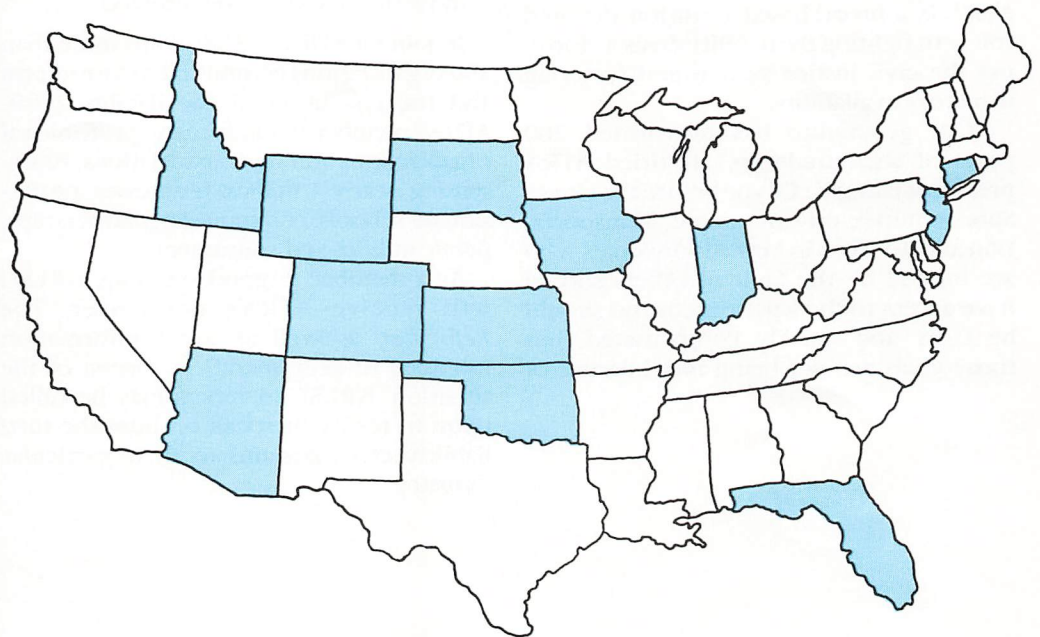
Arizona. Governor Bruce Babbitt signed legislation limiting the liability of establishments serving alcohol, but vetoed a package of tort reform bills. The vetoed legislation sought to modify joint and several liability, change the collateral source rule, cap contingency fees and permit periodic award payments to plaintiffs. A coalition named Citizens for Fair and Sensible Liability Laws gathered more than 200,000 signatures (the most in the state's history) to ensure that a referendum to repeal a provision of Arizona's constitution prohibiting award ceilings will be on the Nov. 4 ballot.

Connecticut. On the last day of its session, the Connecticut House passed legislation by a substantial margin that modifies joint and several liability, restricts contingency fees to a sliding scale, allows installment payments on awards, and requires medical malpractice plaintiffs to prove receipt of less-than-accepted levels of pro-

fessional care. A commission to study the establishment of a trust fund to compensate victims of negligence was also approved. Governor William O'Neill is expected to approve the legislation.

Colorado. Governor Richard Lamm has signed legislation limiting awards for non-economic damages to \$250,000 (except in special cases), and abolishing joint and several liability. The new law also establishes a "certificate-of-review" process, which attorneys will observe in litigation against architects, engineers and land surveyors, and limits awards to an amount equal to plaintiff compensation from other sources. Governmental immunity-from-suit laws and legislation limiting the liability of establishments serving alcohol had been previously enacted.

Florida. The Florida House, by a 108-to-8 vote, passed a legal and insurance reform package that abolishes joint and several liability, caps non-economic damages at \$250,000, and allows doctors, attorneys and other professionals to establish self-insurance trusts. Some disagreement was sparked by a last-minute amendment that called for a 40 percent rollback on commercial and liability premiums, and authorized banks to sell insurance, but the amendment passed after a House/Senate conference committee resolved the issue.



Idaho. Three of four bills dealing with civil justice reform passed the House but died in the Senate. The bills allowed for disclosure of collateral source compensation, limitation on non-economic damages and periodic award payments. The bills will stay in committee until next year.

Indiana. Only two of nine liability-related bills became public laws during the 1986 session. PL 193 authorizes courts to require plaintiffs to pay prevailing defendants' legal costs where suits are found to be frivolous or in bad faith. PL 201 provides that a plaintiff may not recover more than once for medical expenses and loss of wages from all available sources.

Iowa. What began as a comprehensive tort reform package fell apart in the legislature, but several of its provisions still made it into law. The legislation that passed grants authority to Iowa cities and counties to self-insure, allows periodic payments of awards to plaintiffs, sets expert witness standards, and reduces tavern owner and social host liability. A liability insurance study commission, recommended by Iowa trial lawyers, was also approved.

Kansas. Governor John Carlin recently signed bills that limit healthcare liabilities to \$1 million for damages and \$250,000 for non-economic judgments. Non-economic awards will be itemized by juries and settlements will be paid in installments. Legislation was also enacted prohibiting insurers from canceling business and professional insurance policies without policyholder consent. Insurers must give 60 days notice of their intent not to renew.

New Jersey. The New Jersey House recently passed four bills upon the recommendation of the Assembly Committee on Insurance. The bills limit non-economic awards; modify the collateral source rule; dictate that 95 percent of all punitive damages be paid to the state; allow installment payments on future damages awards of \$300,000 or more; and require insurers to submit loss experience, financial and rate determination records. The New Jersey Senate, which remains in session year-round, is expected to sit on the legislation for a few months.

Oklahoma. The group Oklahomans Against Lawsuit Abuse managed to push some liability reform through its state legislature. SB 488 limits most punitive damages to 50 percent of the award and grants up to \$10,000 in legal expenses to a prevailing party when the opposing party's case is found frivolous. Other provisions require insurers to justify their decision to deny a party liability coverage and report company income, expenses and reserves annually.

South Dakota. As a result of the legislature's package of bills designed to control the liability crisis, public entities such as cities, counties and school districts, and their agents, now have a voluntary self-insurance pool. Also included in the package were a \$1 million ceiling on malpractice awards, mandatory pretrial hearings to weed out frivolous cases and installment payments for judgments.

Wyoming. Although Governor Ed Herschler had strong personal reservations about the bill, he allowed SB 16 to become law without his signature. The measure allows courts to limit awards when the plaintiff's contributory negligence in a suit is 50 percent or less. The bill also states that each defendant in a losing cause is liable only to the extent of his percentage of fault. Herschler referred to the bill as a "horrible piece of legislation."

*Oklabomans
Against Lawsuit
Abuse managed to
push some liability
reform through its
state legislature.*

IN BRIEF

■ **RIA sounds the alarm: prevent workplace accidents.** State and local prosecutors across the country are establishing teams to investigate serious workplace accidents, and they intend to prosecute.

The Research Institute of America, Inc., (RIA) warns that courts in at least six states recognize corporate liability for work-related deaths. This activity is largely based on last summer's successful prosecution of three Film Recovery Systems, Inc., executives who were fined and sentenced to 25 years in prison for knowingly exposing an employee to a workplace hazard that caused his death.

As safeguards, RIA recommends that companies remain in compliance with relevant OSHA regulations, investigate and document all worker complaints concerning safety, correct workplace hazards, and publicize efforts to maintain a safe workplace.

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Your UL Class A or B single-ply roofing job is simplified with Manniglas® Slipsheet. First you get classification for fire resistance when you use Manniglas® Slipsheet with many of the UL Class A or B single-ply roofing systems. But the big pluses for you are the new packaging and dimensions. Manniglas® fire resistant Slipsheet rolls are 51" wide and come in standard net roll sizes of 15 and 45 squares depending on thickness—they never weigh more than 100 lbs.

There's nothing else like Manniglas® Barrier Slipsheet. You can't beat it for performance and ease of application. And it's immediately available nationwide. For more information and a list of distributors, call us at (518) 273-6320 or write:



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A maximum security prison is built to last; even the wall and roof insulation must contribute to the building's overall durability. The insulation in the walls must remain rigid to maintain its thermal properties, and the roofing must provide maximum insulation, water resistance and compressive strength.

Because Foamular® insulation products from UC Industries were able to satisfy these requirements, they were chosen for the new Wallkill State Prison in Orange County, N.Y.

"We insisted on using Foamular for the walls," said Douglas Smith of G.A. Masonry in Latham, N.Y. "Foamular was substituted for another insulation, due to its water resistance and thermal properties. And Foamular stays rigid and is easy to handle."

The prison's two types of decking had to be considered when the roofing insulation was chosen. A metal deck covers the gymnasium and recreation area, while a structural concrete deck covers the rest of the roof.

An insulated roof membrane assembly (IRMA) was used on both decks. For the sys-

tem installed over the metal deck, 1½ inches of perlite was placed on the deck, followed by a rubber membrane and then 3 inches of Foamular 404® to provide an R-value of 15.

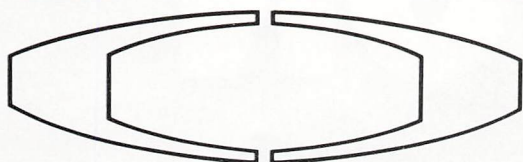
For the rest of the roof, 1 inch of Foamular 250® was used to smooth the concrete before installation of the rubber membrane. Next, 2½ inches of Foamular 404 was added, followed by the stone mat, conifer fabric and the stone ballast.

"We prefer Foamular extruded polystyrene insulation because of its high R-value and easy handling," said Dick Robinson of the Charles F. Evans Co. in Elmira, N.Y., the roofing subcontractor for the job. "We find that the sheets are easy to work with, enabling us to cover more area with each piece to implement the job more quickly."

Foamular 404 is UC Industries' latest addition to the Foamular family of extruded polystyrene insulation products. It is designed specifically for use with inverted or protected membrane roof assemblies.

continued on page 43

**Foamular
used to
insulate
prison
roofs and
walls**



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WARRANTED INSULATIVE ROOFING AND RE-ROOFING SYSTEMS

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The new four-story addition to the Nemours Foundation's A.I. DuPont Institute Children's Hospital in Wilmington, Del., ranks among the nation's most modern and most fire-resistant, thanks to Pittsburgh Corning's Foamglas® cellular glass insulation.

The comprehensive diagnostic, treatment, education and research center accommodates 180 patients on four floors. A gym, bowling alley and an indoor swimming pool are also housed in the building.

When designing the building, designers/architects Saxelbye, Powell, Roberts & Ponder of Jacksonville, Fla., had to match or exceed the industry's highest fire-protection standards because handicapped and chronically ill children are difficult to evacuate in emergencies. The structure was divided into 155 designated "smoke zones" with smoke detectors in every

room, corridor and service area. A reversible air conditioning system was installed. A data system, designed to monitor all life-safety, smoke-evacuation, energy-management and security controls, can pin-point a fire alarm tripped anywhere within the facility's 1.7 million square feet of floor space.

To guarantee optimal performance of the structure's environmental controls, insulation choice was key.

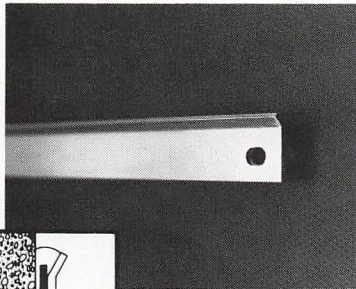
"The Nemours Foundation mandated use of high-quality, proven, long-lasting materials to be as fire-resistant as possible," said architect Donald C. Kluge. Specifiers also sought a product with stable thermal efficiency in extreme weather, high compressive strength, ease of handling and the ability to adhere to limestone.

After testing and rejecting many materials, specifiers chose inorganic Foamglas cellular-glass insulation from Pittsburgh Corning Co.

Cellular glass insulation protects hospital from flame

Pressure Bar

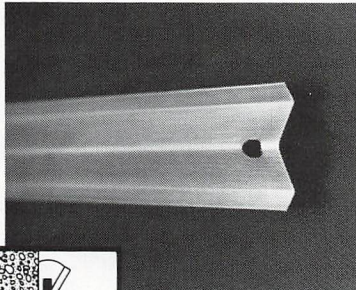
Product No. AL 200



- .100" mill finish 3003 H-14 aluminum.
- 10' 1" x 1" over-all dimensions.
- Slot holes 1/4" x 3/8" punched 4", 8" or 12" on center.

TermBar Patent Pending

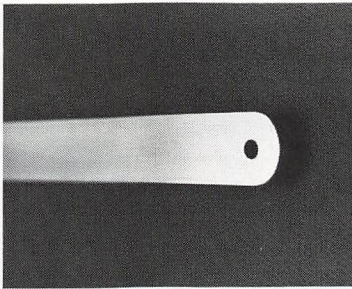
Product No. AL 100



- .040" mill finish aluminum.
- 10' 1" x 1-3/4".
- Slot holes 1/4" x 1/2" punched on 8" or 12" centers.

Bar Anchor

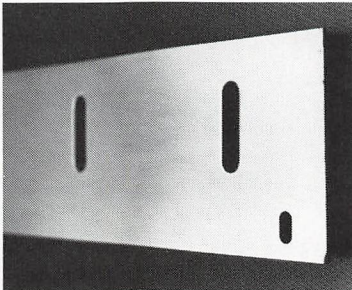
Product No. GA 300



- 16 ga. CR coated steel — four (4) times better than G-90 galvanized.
- 1" x 10" long.
- 1/4" hole punched on 12" centers. End radius rounded.
- Exceeds new FM specs for corrosion resistance.

Gravel Retainer

Product No. AL 500 (aluminum)



- .100" mill finish aluminum.
- 10' x 3-1/2" wide.
- 3/8" x 1-1/2" slots spaced 4" on-center along entire length for drainage.
- Slot holes 1/4" x 1/2" punched 12" on-center for fastening.
- For use with ballasted systems.

JBD SUPPLY

High performance roofing systems require quality accessories to complete every installation. JBD Supply has the hard-to-get items so important for a good job.

Pressure Bar — The most popular termination bar on the market today! Aluminum bar formed with a caulk trough. Excellent rigidity, easy installation.

Term Bar — Two pressure points for superior holding power. Keeps membrane secure, even on irregular walls. Great for modified sheets as well as single ply.

Bar Anchor — Quality attachment strips for mechanically fastened roofs. No sharp edges, no burrs to cut membrane. Now made of CR steel for superior corrosion resistance. Available with counter-sunk holes or LW profile for use with Gyptec™ style fasteners on lightweight decks.

Gravel Retainer — Allows drainage of ballasted roofs while keeping the gravel in place, now made of aluminum for improved appearance and corrosion resistance.

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ON THE ROOF

Foamglas met the facility's demanding requirements for inherent non-combustibility.

Foamglas met the facility's demanding requirements for inherent non-combustibility. With no binders or fillers, the all-glass material simply cannot burn. Nor will it contribute to fire-spread or emit toxic fumes when exposed to combustion. In fact, the manufacturer was able to cite cases to the designer in which the product actually contained fire, preventing its spread.

Three Pittsburgh Corning products were chosen:

- flat Foamglas board insulation for the main hospital roof;
- Foamglas insulation blocks for the inner surfaces of all exterior limestone walls; and
- a tapered Foamglas roof insulation system for the roofs of the one-story front and rear entrance areas.

Foamglas also met the facility's requirements for durability. An extremely low, reversible thermal expansion coefficient

makes the material very stable. A closed-cell structure makes Foamglas impermeable to moisture in liquid or vapor forms.

Tapering the roof insulation systems allowed for positive drainage to help eliminate water ponding, a major cause of flat roof failure.

More than 45,000 square feet of 2-inch-thick Foamglas block insulation was applied to the inner surface of the building's limestone exterior with a moisture-resistant, neoprene-based adhesive. The insulation was covered with drywall on occupied floors and exposed on interstitial levels.

On the roof, 2-inch-thick flat boards measuring 2 feet by 4 feet were adhered to the building's concrete roof deck with hot asphalt. A four-ply organic-felt BUR roof topped with white "pea" gravel finished the seven acres of hospital roof.

Outstanding Advantages:

- 1 Paver stones elevated for perfect drainage
- 2 Spacer ribs ensure even joint spacing of pavers
- 3 Pedestals easily sub-divided for corner and edge support of pavers
- 4 Through drainage and aeration eliminates freeze-thaw damage to pavers
- 5 1/8" plates enable perfect levelling of paver

Turn a plain roof into a pedestrian plaza the easiest, most efficient way:

The PAVE-EL[®] PEDESTAL SYSTEM

Now you can easily transform a roof into a patio, terrace, balcony, walk-way, plaza, podium, promenade, or just plain roof-deck, using the unique Pave-El Pedestal System.

Designed to elevate, level, and uniformly space paver stones for positive drainage in any weather, Pave-El reliably *protects both roof and paver stone, both membrane and insulation*. Ease of installation makes it highly profitable. Superb weatherability and elimination of maintenance make it the ultimate way to lay paver stones.

Request detailed specification brochure.

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Asbestos... The Good News in Roofing Mastics

It's Time to Separate Fact
From Fiction... And
The Fact is, Nothing
Works Better or is More
Cost-Effective Than
Asbestos-Fibred Roof
Coatings and Cements.

Another fact: asbestos-fibred roofing mastics are totally safe to use. Asbestos, when used in roofing mastics, is literally locked in. The technical term is "encapsulation".

Let's look at the facts about a material found only in the finest roofing products.

Fact: Asbestos-fibred roofing mastics are unsurpassed for longevity, protection, handling and cost. In coatings and other mastics, asbestos reinforces the asphalt, preventing the asphalt from cracking from expansion and contraction. Asbestos-fibred roofing mastics provide high "slump" resistance, retard oxidation and deterioration, retard melting and running of the mastic in the event of fire, are more flexible than coatings without asbestos, are less likely to crack and leak than coatings without asbestos, provide greater protection than coatings without asbestos. Therefore, asbestos-fibred mastics need to be applied less frequently than mastics not containing asbestos.

Asbestos-fibred roofing mastics outperform by a substantial margin, roofing mastics without asbestos. THERE IS NO REASON NOT TO USE ASBESTOS-FIBRED ROOFING MASTICS, BECAUSE THERE IS NOTHING BETTER FOR TODAY'S ROOFING NEEDS... AND THEY ARE ABSOLUTELY SAFE TO USE.

Fact: Encapsulation makes it impossible for asbestos fibers to be released from roofing mastics into the ambient air. Encapsulated products are so safe that they do not require special work practices or government control. Regardless of the amount of asbestos in various types of roofing mastics, the full encapsulation of fibers renders the asbestos completely "unbreathable".

Fact: A medical expert study of 6,500 roofers failed to discover a single case of mesothelioma (cancer of the lining of the chest and abdominal cavity). The expert conclusion was that this would not have been the case if asbestos roofing mastics presented a significant hazard.

Fact: Studies done for the Environmental Protection Agency (EPA) address the safety of encapsulated asbestos fibers in roofing products. The EPA's most recent revision to its regulation, "National Emission Standard for Asbestos", makes a specific exemption for spray-on application of encapsulated mastics, further attesting to the total lack of risk associated with the use of such products.

Monsey Products Company has always been in the forefront of the fight to make our environment and the workplace as safe and clean as is humanly possible. That's why our own standards of product safety exceed those required by environmental regulatory groups. This same dedication extends to product quality. It's your assurance of the finest roofing mastics available today. Asbestos-based roofing mastics.

These are the facts. Don't let anyone tell you anything different.

For reprints of this ad, write:

Michael P. Manning
Assistant Vice President
Monsey Products Co.
Cold Stream Road
Kimberton, PA 19442

COMING EVENTS

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

Aug. 25-26

Selection and Use of Single-Ply Roofing Systems
University of Wisconsin-Madison
Madison, Wis.

Sept. 8-12

Infrared Scanning Course
Infraspection Institute
Burlington, Vt.

Sept. 9-10

Structural Standing Seam Roofing
Roofing Industry Educational
Institute
Cherry Hill, N.J.

Sept. 11-12

Single-Ply Roofing Systems
Roofing Industry Educational
Institute
Cherry Hill, N.J.

Sept. 15-16

Construction Claims and Disputes
for Owners, Contractors,
Developers, Architects and
Engineers
Construction Education
Management Corp.
Manhattan Beach, Calif.

Sept. 16-19

Basic Roofing Technology
Roofing Industry Educational
Institute
Atlanta, Ga.

Sept. 16-20

31st Annual Convention
National Association of Women in
Construction
Little Rock, Ark.

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Broadview, Ill.

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Enterprise, Ala.

JOE RUTKOSKI
Tampa, Fla.

ROBERT F. SHEA JR.
Mattapan, Mass.

ALAN WOLF
Cincinnati, Ohio

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Broomfield, Colo.

MICHAEL BOWLING
Louisville, Ky.

JOHN L. BROWN JR.
Delray Beach, Fla.

RANDY DENCHFIELD
Washington, D.C.

JIM GENTRY
St. Louis, Mo.

WILLIAM HAMLIN JR.
Garner, N.C.

BENNETT HUTCHISON
Atlanta, Ga.

PHILLIP LaDUKE
Detroit, Mich.

VERNON LARSON
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JOHN LLOYD
Uniontown, Pa.

BRUCE MARTIN
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6620

Toggle bolts release adhesive

Olympic Fasteners has introduced a new toggle bolt that acts as a positive locking device for insulation and membranes on difficult roof decks.

The Iron Lok toggle bolt is manufactured with a factory-applied chemical adhesive. When assembled, the toggle wings force the release of the micro-encapsulated resins, which remain inert until the bolt is assembled. The resins cure after release without the use of heat or primers.

Check #33 on Reader Service Card

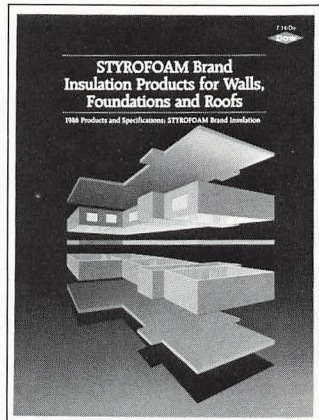
2613

Catalog describes Dow's Styrofoam

The Dow Chemical Co. is offering the Sweet's Catalog File brochure detailing the company's line of Styrofoam™ insulations.

The brochure features cutaway product illustrations and information on specifications, product application, laboratory and field test results, physical properties, and performance warranties for Styrofoam products. Styrofoam is an extruded polystyrene foam with a closed-cell structure designed to provide high water resistance, thermal performance and compressive strength.

Check #34 on Reader Service Card



4550

Board eliminates need for base sheet

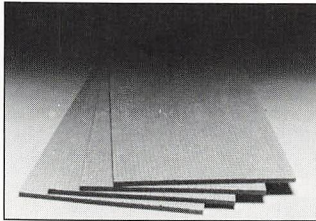
Fireshield, a new rigid roof insulation board from International Permalite, Inc., has been designed for use without a base sheet.

The insulation is a fire-resistant board made from particles of expanded perlite, cellulose binders and a sizing agent. It is designed for use with Permalite's Torchskin membrane, which is applied using a propane torch. This combination eliminates the need for separate base sheets.

An enhanced version of Permalite's perlite board, Fireshield features a restructured chemical and fiber composition for internal strength. A surface perforation pattern allows melted bitumen to flow inside the board, increasing its anchoring strength. The board has a surface coating that protects it from the torch's flame while the Torchskin membrane is being applied.

The company has also announced a new 15-year service guarantee for the system when it is installed by registered Permalite roofing contractors.

Check #35 on Reader Service Card



3827

Grefco publishes Permalite catalog

Grefco, Inc., has published an eight-page catalog detailing Permalite perlite concrete aggregate.

The brochure includes information on the properties of perlite insulating concrete, along with design data and roof/ceiling designs that carry fire ratings of up to three hours. Details on installing perlite over corrugated steel decking and structural concrete are included with information on the use of perlite in reroofing applications.

Tables in the publication give data on the thermal performance of Permalite decks containing from 1 to 4 inches of polystyrene board over steel decking and structural concrete. Other charts outline the holding power of various fasteners in Permalite perlite and give details on typical properties of different Permalite perlite concrete mixes.

Check #36 on Reader Service Card

continued on page 49

The Siplast product line has evolved over nearly three decades of designing systems to satisfy the critical demands of specific roof conditions.

A key discovery in this evolution was our development of SBS Modified Bitumens in 1968, as a response to increased stresses imposed by modern roof construction. Modifying asphalt with SBS produces an elastomeric blend with exceptional elongation/recovery properties over a wide range of temperatures. We combine this blend with appropriate reinforcements and surfacings to create a full line of systems, each engineered for a specific use.

Our systems also provide the right application method for varying job requirements, allowing you the practical advantage of choosing hot asphalt, cold adhesive or torching. Plus we offer one of the largest varieties of colors and finishes available in the

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This ability to provide the *right* product for each application, rather than one product for all uses, is a cornerstone of the Siplast philosophy.

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Superior product design — just one of the many elements that sets us apart in high-performance roofing.

For more information on any of our roofing systems, call 1-800-922-8800. In Texas, call collect 214/869-0070. Siplast, Xerox Centre, Suite 1840, 222 West Las Colinas Blvd., Irving, Texas 75039.



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Some manufacturers expect one roofing product to do everything.
We don't.



Check #25 on Reader Service Card

NEW IDEAS IN INSULATION

Cooley updates company catalog

Cooley Roofing Systems has released two new items for addition to the Cooley Roofing Systems catalog.

Detail drawing #M29-1 illustrates the installation of CPE walkways for mechanically fastened systems. The Technical Bulletin #2007, "Insulation Fastening Guide," details minimum fastening requirements for all deck types. Copies of both the detail drawing and the technical bulletin are available from the company for those needing to update their catalogs.

Check #37 on Reader Service Card

Tapered Foamglas line expanded

The Pittsburgh Corning Corp. has expanded its line of Tapered Foamglas® roof insulation systems.

The company's new PC Plusystems™ are based on Foamglas R+ cellular glass insulation, which is resistant to moisture. This makes the PC Plusystem specially suited for applications that are subject to high temperatures or humidity.

The PC Plusystem 1 with Foamglas R+ underlayment offers extremely high moisture resistance, ensuring thermal efficiency while providing maximum compressive strength. This system carries a 20-year warranty, and is recommended for roofs where longevity and reliable thermal performance are important.

PC Plusystem with PF (phenolic foam) underlayment provides a very high R-value. This system is recommended for buildings that have normal interior temperatures and humidities, but need a high R-value roof system to compensate for insulation thicknesses that are limited by physical or cost restrictions.

The PC Plusystem with PI (polyisocyanurate foam) underlayment is recommended for buildings with normal temperature and humidity that do not require the highest R-rating, and where physical or cost restrictions limit the amount of insulation.

Check #38 on Reader Service Card

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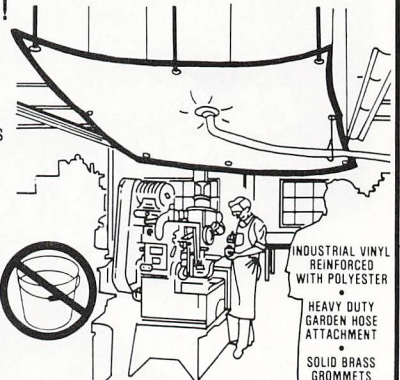
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At last a product has been developed to make those untimely leaks a little less frustrating.

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



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Check #16 on Reader Service Card

Koppers delivers bulk resaturants

The Koppers Co., Inc., is offering a bulk delivery system for roof resaturants.

The Profit Pumper delivery system offers lower cost per gallon for volume purchases of resaturant, which can be delivered to numerous jobsites without the need to load and unload the cargo. The system also eliminates the need for storage or disposal of resaturant and empty drums.

The Profit Pumper tank truck, which has a 4,500-gallon capacity, delivers resaturant directly to the jobsite, where it is pumped onto the roof. The truck's tank features built-in heating coils to keep the resaturant at the proper temperature. The unit keeps pump pressure high even on multi-story buildings. The resaturant is applied to the prepared roof using spray wands.

Check #39 on Reader Service Card

White FireGard resists fires

WeatherGard Roofing Systems has developed a new EPDM membrane for use over combustible decks.

The White FireGard U450 fully adhered membrane is designed to combine the advantages of a fire-rated material with the energy savings of a white single-ply membrane. It is available in standard widths from 5 to 50 feet in 100-foot lengths. The company also carries all the accessories, including power tools, necessary to apply the membrane to the deck.

In addition, WeatherGard has announced the availability of updated technical information on the company's EPDM systems. The revised information will be included in all the company's roof design manuals, and is free for those who have earlier editions of the manual.

Check #40 on Reader Service Card

CertainTeed offers safer underlayment

The CertainTeed Corp. has announced the development of a new waterproof underlayment that offers greater safety for the roofer.

The WinterGuard underlayment is designed to prevent leaks caused by ice dams under shingle roofs. The WinterGuard underlayment improves installation safety by replacing the slippery film surface found on many underlayments with a non-filmy, non-slip surface that reduces the danger of falling on pitched roofs.

The WinterGuard membrane features a new adhesive that seals after the membrane is laid, allowing the membrane to be repositioned if necessary. The adhesive, which is less sticky when the backing is first removed, sets a short time after the membrane is installed. The membrane's design incorporates an interior reinforcement that allows the material to be pulled up and reset without tearing before the adhesive has solidified.

WinterGuard is backed with a light polyethylene film. The film handles easily and compresses well for trash disposal.

CertainTeed has also published *Reroofing: A Homeowner's Guide to Products, Procedures and Potential Problems*. The *Guide* offers information and advice for homeowners who have questions about roof repair and replacement.

Check #41 on Reader Service Card



Beauty is more than skin deep.

Long life is the true beauty of a modern roof system.

Contour Taper Tile® expanded polystyrene (EPS) combines high insulating value with drainage for dead level roof decks. Small roofs or thousands of squares, economical Contour Taper Tile lengthens roof life and cuts energy costs.

Compatible with loose-laid and adhered systems — built-up or single-ply designs — Contour Taper Tile's positive drainage adds life to any system you choose. The best roof membrane is a dry roof membrane.

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Call Toll Free: 1-800-255-0176

Check #2 on Reader Service Card

NEW IDEAS

Perma-Roof covers mobile home roofs

Classic Products, Inc., is marketing a new roof-over system for mobile homes.

The Perma-Roof system starts with a polyfilm vapor barrier installed over the old roof for moisture protection. J-purlins and pitched galvanized steel trusses, adjustable for single- or double-width homes, are installed over the polyfilm barrier. Rustic Shingle aluminum roofing panels, which are designed to simulate traditional wood shakes, are then snapped into the purlins. The panels are designed with a four-way interlocking system for wind resistance and watertightness; no nailing is required to attach the panels to the purlins.

The Perma-Roof system carries the Underwriters Laboratories Class A fire rating. The Rustic Shingle comes with a 40-year prorated warranty against rusting, peeling, flaking, chipping and splitting.

Check #42 on Reader Service Card

U.S. Single-Ply makes MightyPlate

U.S. Single-Ply, a wholly owned subsidiary of the Texas Refinery Corp., has announced that it is now producing Texas Refinery's MightyPlate single-ply roofing membrane in a new facility capable of turning out more than 2,500 squares of roofing per day.

MightyPlate is a bituminous membrane modified with amorphous polypropylene and reinforced with a non-woven polyester core. U.S. Single-Ply is now the only manufacturer of the product, which has been marketed by Texas Refinery for four years.

Check #43 on Reader Service Card

Kool Seal offers aluminum coating

Kool Seal has announced the availability of a new aluminum roof coating designed to cut cooling and heating costs.

Blue Label aluminum roof coating contains aluminum pigments for reflectivity on roof surfaces. These pigments are combined with long Canadian fibers to add durability to the coating, which carries a five-year limited warranty. Blue Label roof coating is available in five-gallon pails.

Check #44 on Reader Service Card

Werner releases Snap-Up catalog

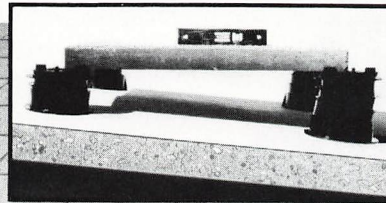
The R.D. Werner Co. is offering a catalog describing the company's line of Aldek® Snap-Up™ portable aluminum scaffold bases.

The scaffold bases feature snap-in-place braces for quick set-up and take-down requiring no extra tools. The units also have diagonal braces with steel latches that lock when the unit is fully extended. Spring-load latches allow the scaffold base to be folded for storage in a small amount of space.

The bases are designed with ball bearing casters, adjustable legs with double locks and snap-hook frame locks. They are available in the 4150 Series narrow span, which includes one Aluma-Plank® deck platform, and the 4250 Series wide span with two deck platforms. Both versions are available in 6- or 8-foot-long models, and are duty rated at 25 pounds per square foot. Accessories such as rolling outriggers for extra stability and toeboards for use with upper section platforms are also detailed in the catalog, along with erection instructions and other product information.

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NRCA NEEDS YOUR HELP

We're running short on materials for the museum at the Centennial Convention in San Francisco. If you have any of the following items and wouldn't mind loaning them to NRCA for the Centennial, we would be extremely grateful pouring dipper, drum hoist, rope & whirl, 1952 felt layer, ladder-rator, gravel spreader, slate roofing-slater and ripper, spray and spray attachment to roofing kettle, spray material drum, hose and air hose, trailer equipped with compressor and hose reel, and a roof buggy. If you have any of this equipment and would like to make it available, contact Gale Kiesel at NRCA; 312/693-0700.

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We have cash to buy roofing and sheet metal companies. They would have sales of \$1 million and some profit. Will tailor buyout to suit seller. All responses kept confidential. Send replies to Box 4A, *Roofing Spec*, 8600 W. Bryn Mawr Ave., Chicago, Ill. 60631-3502.

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Must have prior experience as a superintendent or at least five years experience as a roofing foreman. Must be experienced in built-up and single-ply. Excellent wages and benefits for right person. Send resume to G. L. Kautz, Inc., 318-336 N. Marshall St., Lancaster, Pa. 17602.

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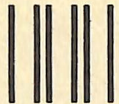


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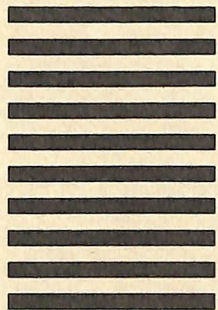
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- The legal side of roofing
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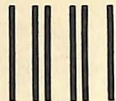
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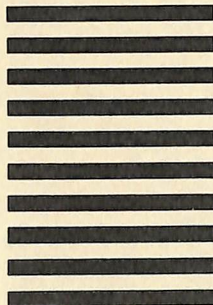
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August 1986

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THE HIGHEST R-VALUE IN THE INDUSTRY. The high R-Value of PHENOLIC-PLUS is made possible by a new type of phenolic foam that eliminates thermal drift. Independent testing shows that a one-inch thickness delivers an R-Value of 8.3. That's higher than any other type of material currently available to the industry. Moreover, PHENOLIC-PLUS displays virtually no R-Value reduction through aging.

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that can be applied directly over a protected metal deck and have the roof/ceiling system achieve a fire-resistance rating of one, one-and-a-half and two hours.

EXCELLENT CORROSION RATING. Genstar PHENOLIC-PLUS has been extensively tested in accordance with standard metallurgical procedures for the effects of corrosion on metal. The test results indicate that PHENOLIC-PLUS does not promote corrosion of either metal decks or approved mechanical fasteners.

STRONGEST TECHNICAL SUPPORT. Genstar technical representatives, strategically located across the country, provide highly competent professional consultation and assistance. On projects covered by Genstar's Roof Membrane Warranty Program, our technical representatives provide periodic on-the-roof inspections with the contractor to assure an installation that meets Genstar's specifications and standards of quality.

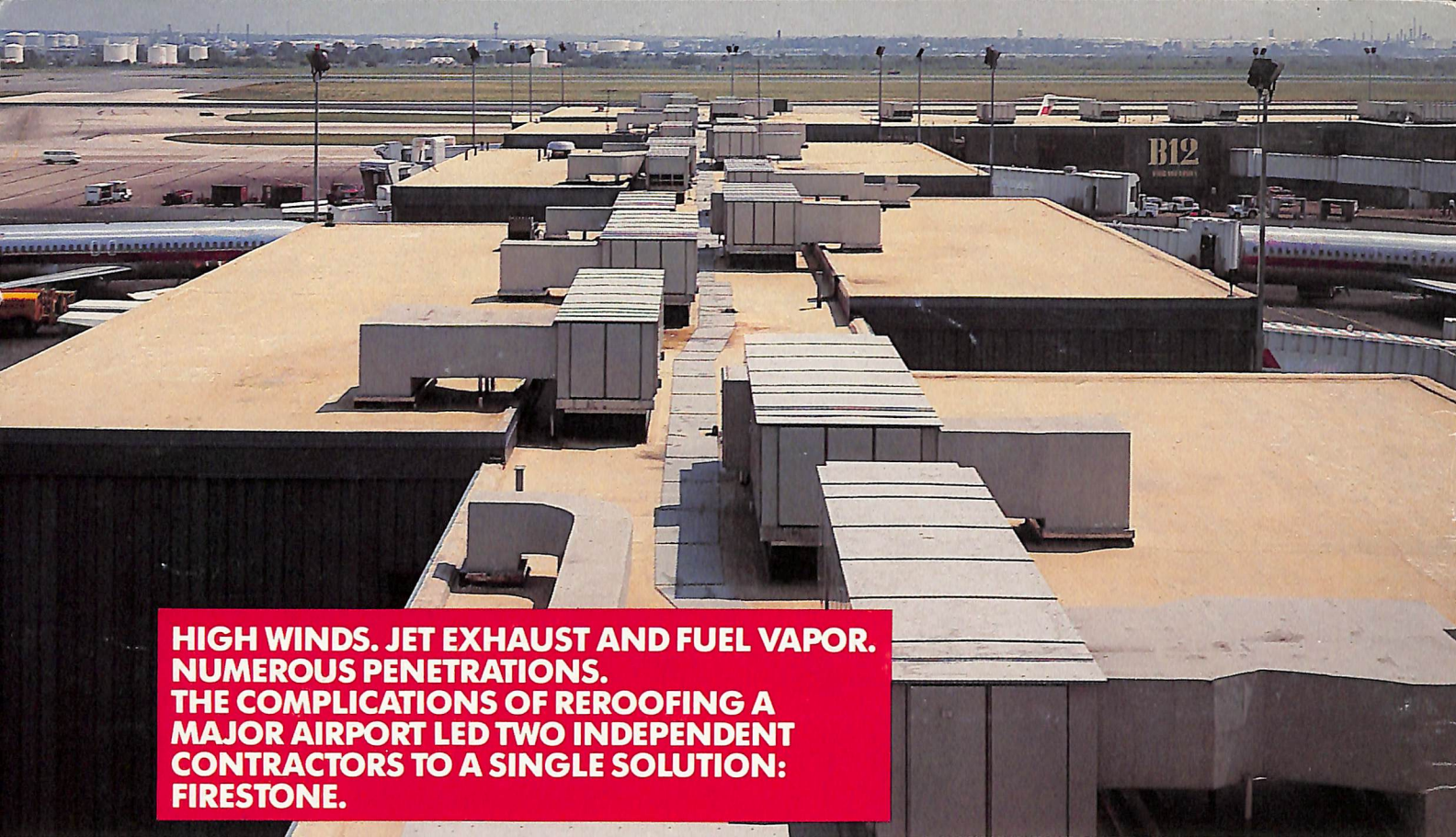
TOTAL GENSTAR PROTECTION. Warranties of Genstar's full line of products and systems are backed by the company's reputation and financial strength. Genstar's Full-Value warranties, available on projects installed by authorized Accredited and Licensed Genstar contractors, are so comprehensive that they provide coverage even beyond the building owner's original installed cost of materials and labor. That's the strong protection behind the strong performance of PHENOLIC-PLUS.

GENSTAR[®]

Performance is the promise.

For additional information, contact:
Genstar Roofing Products Company, Technical Manager,
Commercial Roofing, 5525 MacArthur Blvd., Suite 900,
Irving, Texas 75038, 214/580-5600

*The numerical flame spread rating as determined by ASTM Test Method E-84 is not intended to reflect hazards presented by this or any other material under actual fire conditions.



HIGH WINDS. JET EXHAUST AND FUEL VAPOR. NUMEROUS PENETRATIONS. THE COMPLICATIONS OF REROOFING A MAJOR AIRPORT LED TWO INDEPENDENT CONTRACTORS TO A SINGLE SOLUTION: FIRESTONE.

The problems facing contractors reroofing the Philadelphia International Airport were as big as the airport itself.

High winds, jet exhaust, corrosive fuel vapors, building vibration and expansion—all had accelerated the decay of the existing built-up roof. Cracks and leaks abounded. Blowing roof debris threatened jet engine intakes.

Plus a new HVAC system was going in, requiring an enormous number of penetrations, with difficult flashing details.

In the face of all this, the airport engineer and architect recommended against another BUR. They specified EPDM rubber. And their two independent roofing contractors specified Firestone.

“Support was critical for this job, and from the beginning Firestone worked with us in putting it all together,” said Zach Hamada, of the Philadelphia-based Hamada Inc., contractor for the recently completed Concourse “B.”

Hamada laid down Firestone RubberGard® 60 mil EPDM, fully adhered over 1" high density fiberboard insulation. A top coat of Hypalon® paint and silica sand protects against fuel vapor and gives the new roof a UL Class “A” fire rating.

Firestone field personnel helped with flashing details and conducted two interim inspections. The final warranty inspection came within 30 days of job completion.

“Firestone is providing us with tremendous technical assistance,” said Jerry Hughes of Davisville Contracting, Ivyland, PA, which is in the midst of reroofing two other concourses and the main terminal. “Not only is the quality of their product excellent, they respond quicker than other companies.”

Contractors across America choose Firestone RubberGard for its strength, durability, economy, ease of installation—and Firestone’s outstanding field support.

Firestone’s good name insures your good name, even on the most difficult jobs. Call 1-800-428-4442.

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