

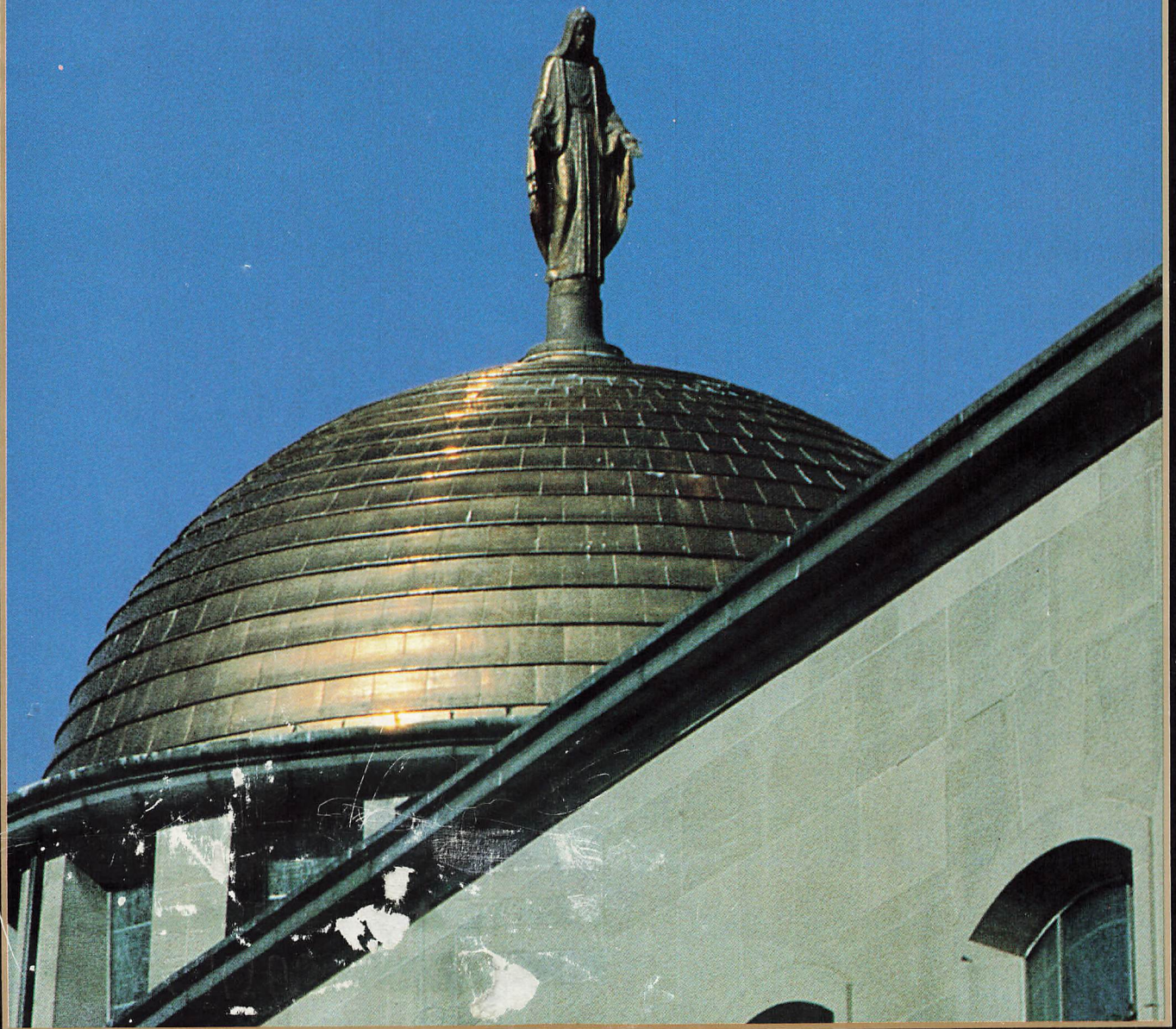
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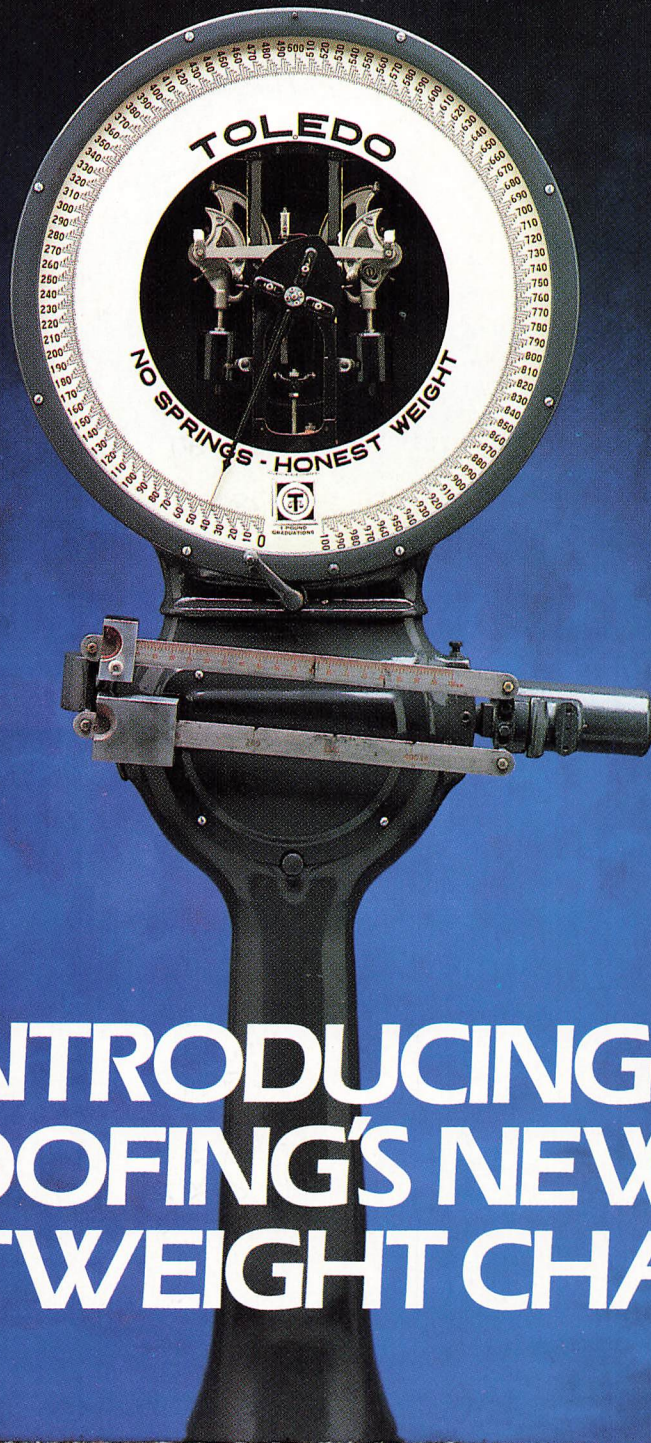
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National Roofing Contractors Association

November 1983

METAL ROOFING





INTRODUCING ROOFING'S NEW LIGHTWEIGHT CHAMP

STYROFOAM* LG INSULATION: STYROFOAM brand insulation with latex-modified concrete surface.

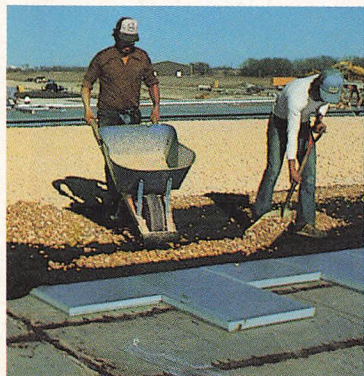
Our new STYROFOAM LG brand roofing product is light in weight and guards the membrane from damage. The system incorporates a $\frac{3}{8}$ -inch latex-modified concrete surface bonded directly to boards of STYROFOAM brand insulation.



You get all the advantages of STYROFOAM — lasting high R-value, moisture resistance and excellent compressive strength, which stands up to normal foot traffic. And because no general ballast is needed, labor and materials costs can be reduced.

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The IRMA system using STYROFOAM brand insulation, America's standard for trouble-free, energy-efficient roofs.

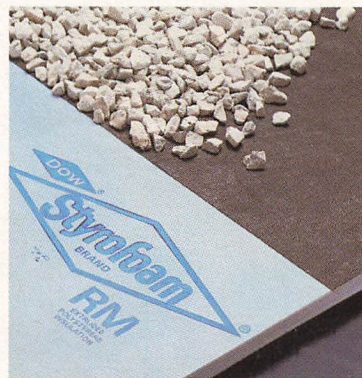


The IRMA system, incorporating STYROFOAM brand insulation on top of a roofing membrane, has been performance proven in thousands of installations throughout the country. It's a simple, cost-efficient way to build a well-insulated roof. The IRMA system, incorporating

STYROFOAM is trouble free, moisture resistant and withstands physical abuse, including the push and pull of repeated freeze-thaw cycles.

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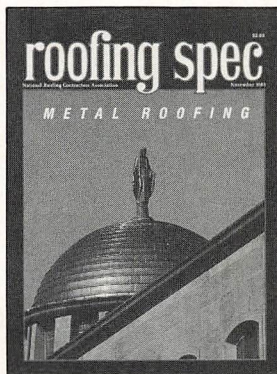
roofing spec

Vol. 11, No. 11

November 1983

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The gleaming dome atop Our Lady of Mercy Catholic Church, Chicago, exemplifies the appeal of the metal roof.



NATIONAL ROOFING CONTRACTORS ASSOCIATION

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

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Comment

Has NRCA gone flat?

There has been, we know, a lingering suspicion that NRCA speaks only for the "big boys" of the roofing industry, that the commercial/industrial — flat — part of the industry dominates the NRCA list of priorities.

Regarding that suspicion, a few observations:

1. It mostly ain't so. Educational programs, convention programs, insurance programs, safety programs and our new public relations program have all been carefully structured to represent all contractors — small as well as large, residential as well as commercial.

2. The needs and interests of the not-so-big boys are, for the most part, exactly the same as those of larger contractors. All roofing contractors want properly designed buildings, quality materials, trained workers, and a business environment free from excessive government regulations.

3. The participation of smaller contractors in industry matters has never been greater. There is evidence everywhere; the most dramatic, perhaps, will

be the forthcoming release of the revised NRCA Steep Roofing Manual.

4. The biggest of roofing contractors is a small businessman by almost any definition. The distinctions between "big" and "small" in our industry tend to fade into insignificance . . . or at least they should.

5. Finally, it comes down to this: our industry's remarkable progress is due in no small measure to the collective actions of many of its members. NRCA's history is steeped, forgive the pun, in teamwork. Continued progress demands a continuing awareness of the power that comes from the strength of numbers.

6. Was the suspicion, then, totally unfounded? Of course not. But what must prevail is this: the emerging importance of the roofing contracting industry within the building and design community. And that's vital to everyone.

Bill Hood

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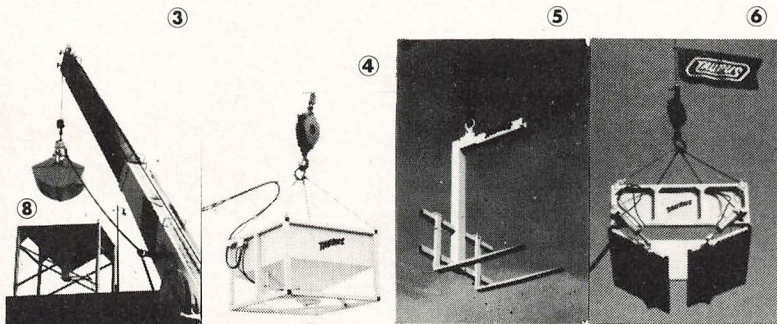


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Ideas, notes and random thoughts

"Metal Roofing Merits Attention by Roofing Contractors" says John Stover of the Metal Building Manufacturers Association and read why inside. . . Editorial Assistant Martin Eastman reviews the choices available for contractors who opt for a metal roof system. . . "Safe and Sound" is a new monthly column written by contractors that presents practical tips on safety in the workplace. . . Have you considered "Organizing Your Marketing Effort with a Marketing Information Data Base?" The Falls Management Institute tells you how. . . And, Rene Dupuis discusses the results of single-ply testing in the first of a two-part series.

The 1983-84 NRCA conference series takes off in December with two programs: ROOFING SYSTEMS on Dec. 1 in Nashville, Tenn. and REROOFING and ENERGY CONSERVATION on Dec. 8 in Seattle, Wash. The ROOFING SYSTEMS CONFERENCE examines the performance and design considerations involved in construction of satisfactory roof systems. The CONFERENCE ON ROOFING and ENERGY CONSERVATION looks at reroofing options with emphasis on potential energy payback. For program brochures, contact Alan Grayson in NRCA's Education Department at 312/693-0700.

Computers are now available in a number of hotels around the United States. It seems to be just one of the newest amenities being offered

to traveling executives. The Midland Hotel in Chicago equipped one third of its 300 rooms with terminals last spring. Guests play

games, check airline schedules, stock quotes and the news, and send electronic mail, according to *The Wall Street Journal*. At the same time, Dallas-based Travelhost, Inc. said it planned to have 10,000 rooms with terminals in 150 hotels by the Labor Day holiday.

National Roofing Foundation Update

The National Roofing Foundation (NRF) is sponsoring a doctoral dissertation on roofing at Clemson University, Clemson, S.C.

The study, "Thermo-Mechanical Characterization of Modified Bitumens for Use in Low-Slope Roofing," will be conducted over a 10-month period by Joel P. Porcher, Jr. under the supervision of Herbert W. Busching, professor of Civil Engineering.

This is the first time that the Foundation has sponsored a doctoral dissertation.

The Foundation provides funds for educational purposes intended to benefit the roofing industry.

You can become a Friend of the Foundation by donating \$50 annually. The funds provide scholarships and assist in the development and promotion of educational materials.

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

Ken Nyquist will head NRCA's newly established government relations department. Nyquist is an attorney and previously worked for the Michigan Bankers Association. He is currently planning the Political Action Committee's fundraiser for the 97th Annual Convention and the second Legislative Conference to be held in Washington, D.C., April 1-3, 1984.

It's here! The third edition of the *NRCA Roofing Materials Reference & Guide* is now available. The *Guide* includes hundreds of built-up roofing specs and elastoplastic sheet-applied roofing membrane products, representing over 70 manufacturers and suppliers. You can use the *Guide* to compare the characteristics of similar generic materials and analyze products based on uniform testing procedures. The *Guide* is updated and published three times per year on a subscription basis. For details contact Norm Bullock at NRCA: 8600 Bryn Mawr Ave., Chicago, Ill. 60631; 312/693-0700.

"The chief foe of progress is indeed not competition but complacency."

Anonymous

NATIONAL NEWS

Construction Contracts Rebounded in August to \$18.6 Billion

Contracting for new construction rebounded in August, recouping more than half of July's setback, reported the F.W. Dodge Division of McGraw-Hill Information Systems Co.

The Dodge Index of total construction contract value rose in August to a seasonally adjusted 146 (1977 = 100). After reaching an all-time high of 151 in June, the index of future construction activity dipped to 137 in July before making a comeback in August.

On an unadjusted basis, August's contracts for newly started construction of all kinds totaled \$18.6 billion, a gain of 36 percent over the total reported a year earlier when the building industry's recovery was just beginning to take hold. Virtually all of the improvement to date has been confined to housing.

"Recent up-down-up movement of the Dodge Index, coming after a sustained rise of building activity between mid-1982 and mid-1983, suggests that the industry may be undergoing a transition," said Dodge Vice President and Chief Economist George A. Christie.

"There's little more expansion to be squeezed out of the housing cycle, but the recovery of commercial and industrial building has hardly begun. The next stage of the construction market's revival is waiting to happen in the nonresidential sector, and it will take hold as the economy's recovery develops in the quarters ahead," Christie explained.

The Dodge economist said that contracts for residential building totaled a "surprisingly strong" \$9.3 billion in August. After adjustment for seasonality, the latest month's

value was 12 percent ahead of July's total, boosting 1983's eight-month cumulative gain 69 percent over last year's amount.

Dodge data showed that August's gain in housing starts came mainly in multifamily building, the side of the market that is less sensitive to interest rates than single-family housing.

According to Christie, "It must be expected that the recent stiffening of mortgage rates will put a chill on the sale of new homes, but that doesn't mean that a sharp decline is the only alternative."

He continued, "The current large backlog of outstanding mortgage commitments could support this market at 1.7 million units or better for several quarters ahead."

August contracts for nonresidential building, totaling \$6 billion, advanced six percent after seasonal adjustment.

"Recovery of nonresidential building is already becoming apparent in contracting for stores and warehouses, which led last year's value by 24 percent through eight months," Christie said.

"Industrial building, however, remained far behind its 1982 total," he added. "As a result, 1983's contracting for total nonresidential building was virtually even with last year's amount through August."

August contracts for non-building construction, consisting of public works and utilities, were valued at \$3.3 billion. Adjustment for seasonality put the category's total one percent ahead of July's rate of contracting.

On a year-to-date basis, nonbuild-

MONTHLY SUMMARY OF CONSTRUCTION CONTRACT VALUE
Prepared by F.W. Dodge Division
McGraw-Hill Information Systems Company

	August 1983 Construction Contract Value (000,000)	Seasonally Adjusted Percent Change From Previous Month
Nonresidential Building	\$ 6,005.9	+ 6
Residential Building	9,257.0	+ 12
Nonbuilding Construction	3,334.4	+ 1
Total Construction	\$18,597.3	+ 7

	8 Mos. 1983 (000,000)	8 Mos. 1982 (000,000)	Cumulative Percent Change
Nonresidential Building	\$40,749.6	\$ 41,314.5	- 1
Residential Building	62,242.9	36,867.1	+ 69
Nonbuilding Construction	26,848.9	24,697.1	+ 9
Total Construction	\$129,841.4	\$102,878.7	+ 26

DODGE INDEX

(1977 = 100, SEASONALLY ADJUSTED)

June 1983	151
July 1983	137
August 1983	146

continued, page 12

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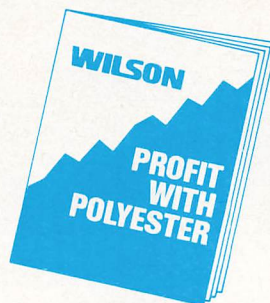
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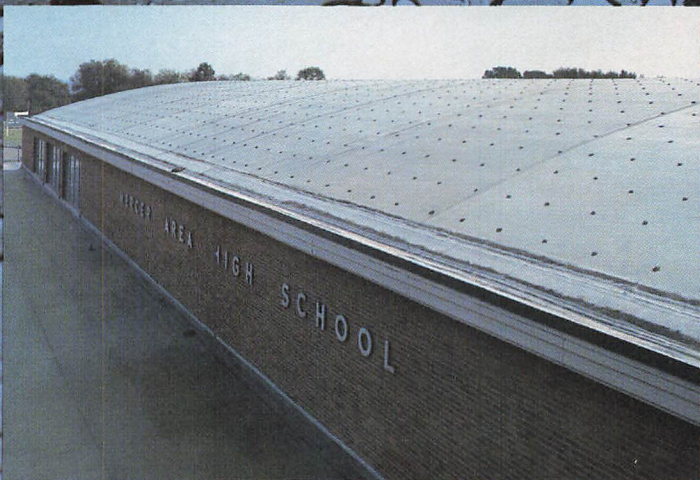
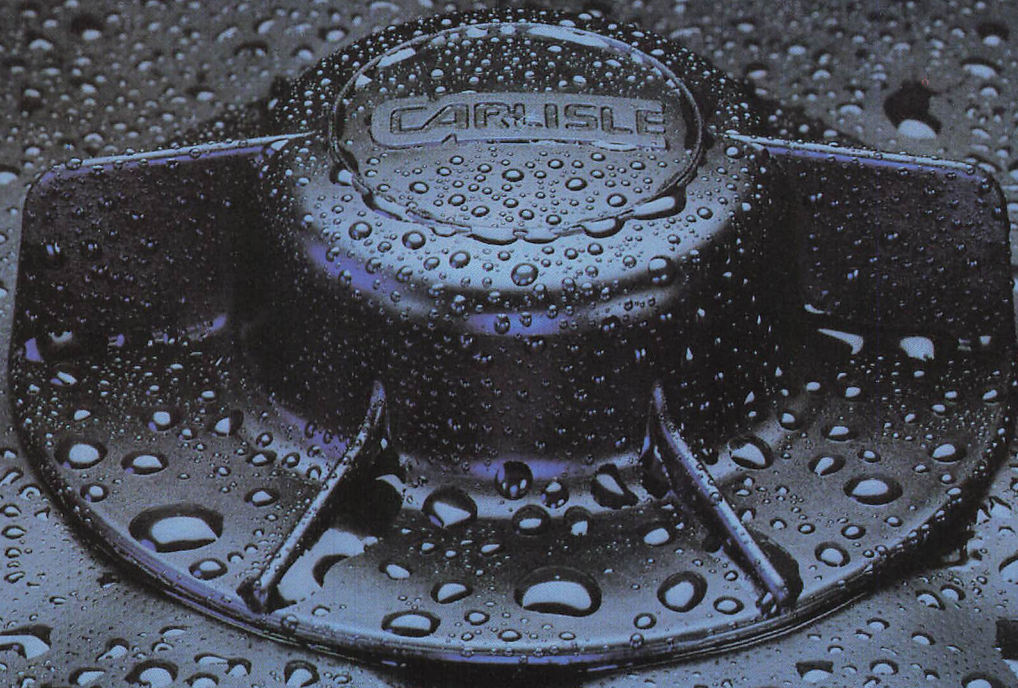
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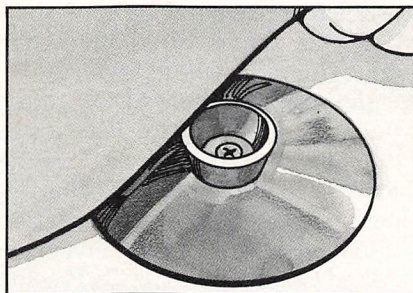
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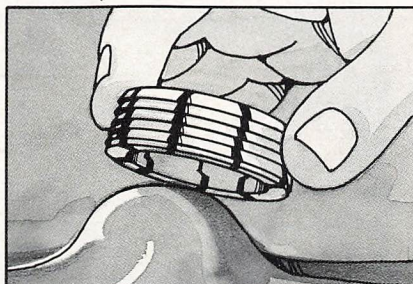
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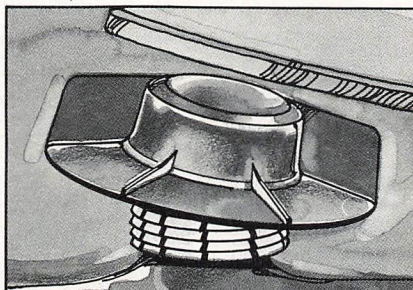
of new buildings—especially those that can't support much weight. Also takes to unusual shapes, and fastens to most substrates. Accommodates building expansion and contraction, and can even be moved to another location!



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NATIONAL NEWS

continued from page 8

ing construction contracting was up nine percent through August. "Virtually all of that gain has been in highway and bridge construction, and most of it has taken place since April when the five-cents-per-gallon fuel tax went into effect," Christie said. "Four of every five cents raised by the new Federal levy directly supports highway and bridge construction."

Utility construction for 1983 to date was five percent below the comparable 1982 value. No utility projects of consequence were initiated last month.

By region, the midwest and south each showed modest August construction gains on eight percent, contrasting with a 31 percent advance in the west and a 13 percent decline in the northeast.

At the end of the eight months, the value of all new construction started in 1983 reached \$129.8 billion, a

gain of 26 percent over the same 1982 period.

AWCI Proposes Union Merger

The Association of Wall and Ceiling Industry-International (AWCI) has notified the presidents of three building trade unions that a merger — leading to a single union — is the only reasonable alternative to the emerging non-union threat.

In separate letters to the International Brotherhood of Painters and Allied Trades, the Operative Plasterers and Cement Masons International Association and the International Union of Bricklayers and Allied Craftsmen, AWCI's President

Robert H. Whittle urged the union leaders to recognize the impact of survey-supported trends and to act.

"Virtually every survey we read confirms what major construction writers and others observe about the construction industry: that construction in North America will be open shop within the span of a few short years," Whittle said.

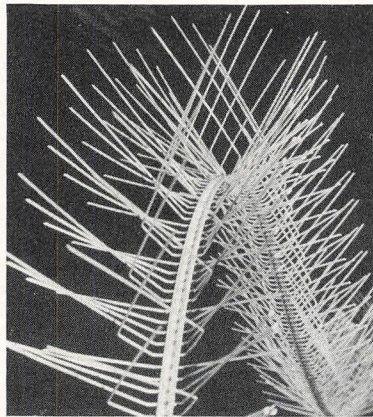
He cited a recent survey conducted by AWCI which shows that the reported union shop to non-union shop ratio still holds at about 85 percent to 15 percent, but with rapid movement into non-union operations.

Whittle added that a large number of contractors participating in AWCI's Montreal convention expressed the intention "to go open shop" when their next union agreement came up.

He also pointed to the recent merger of the Brotherhood of Carpenters with the former Lathers Union.

"These two unions, once vicious jurisdictional competitors, finally sat down and worked out an agreement of affiliations," Whittle said.

The AWCI President asked for serious consideration of the merger plan from the union leaders contacted.



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Shingle Shipments Increase

Shipments of asphalt strip shingles should reach 73 million squares in 1983, compared to less than 62 million in 1982, according to James Shedden, president of the Asphalt Roofing Manufacturers Association (ARMA).

Standard weight three-tab shingles comprise the bulk of industry shipments, with fiber glass-based shingles representing 60 percent of the total.

Contemporary, three-dimensional and laminated shingles, both or-

ganic and inorganic, are also popular.

Earthtone brown hues remain the most preferred shingle colors, followed by white then black.

RIEI Seeks to Expand Staff

The Roofing Industry Educational Institute (RIEI) is looking for a Deputy Director.

The new position requires an administrative leader who would be involved with budget planning, promotional and fund raising activities. A strong business and marketing background is essential. Although a technical degree is less important, the candidate should have experience and involvement in the roofing industry.

Nominations for the position should be sent directly to Richard Fricklas at RIEI, Suite 100, 6851 S. Holly Circle, Englewood, Colo. 80112; 303/770-0613.

NBS Director Elected President of International Council

Dr. Richard Wright, director of the National Bureau of Standard's Center for Building Technology, was elected to a three-year term as president of the International Council for Building Research, Studies and Documentation (CIB) at the Council's 9th Triennial Congress in Stockholm, Sweden.

Wright is the first American to hold this position.

Some of Wright's goals as president of CIB are to strengthen building practices in developing countries, emphasize the use of advanced

computation in building practices and provide a 1986 Triennial congress in the United States that will strengthen the CIB and increase U.S. participation.

Since 1953, CIB has been working to encourage the international building community to exchange research

information and improve building research and practices worldwide.

A total of 62 countries are represented. CIB's 60 full members are comprehensive building research organizations from 41 countries. The

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CLEARFIELD'S BIG HSDU

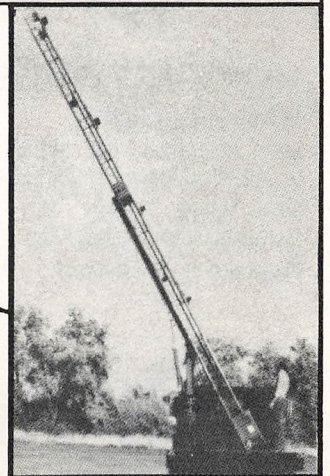
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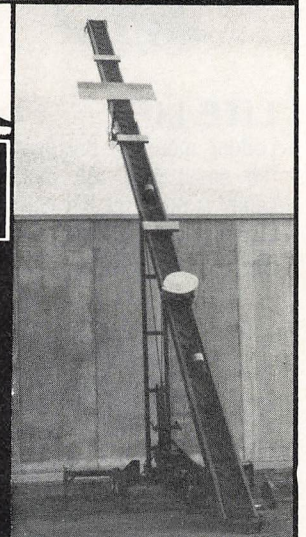
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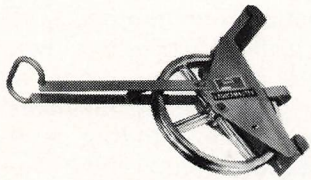


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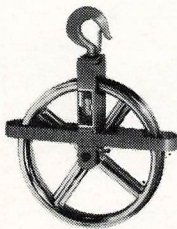
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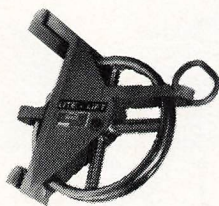
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NATIONAL NEWS

continued

organization's 130 associate members represent more specialized roles in building technology.

The CIB Secretariat is located in Rotterdam, Netherlands. U.S. organizations participate in CIB working commissions through the Advisory Board on the Built Environment of the National Research Council or by direct membership in CIB.

United States members lead six work commissions: organization and management of construction; earthquake hazard reduction; computer-aided design; control of building services; prediction of service life of building materials and components and single-layer roofing.

ASA Amends Model Procurement Code

The American Bar Association has been promoting the adoption of its "Model Procurement Code" for the past seven years. As a result, the American Subcontractors Association (ASA) is launching a nationwide effort to use the code for enacting subcontractor protections.

In 1980, the ASA attached several reforms to the model procurement code approved by South Carolina. ASA succeeded in using the code to implement bid-shopping curbs, to permit subcontractor access to the state in dispute proceedings, to endorse a standard state subcontract, to reduce retainage and to secure a "subcontractor seat" on the Construction Advisory Committee.

"Adoption of a comprehensive code by a state or local government certainly would have a major impact on procurement and, in turn, on the contractors," said ASA Legislative Committee Chairman Jesse Pickett.

"That is why we cannot let this nationwide movement (of the American Bar Association) continue without subcontractor input."

ASA has published a legislative

work kit designed to help its local chapters make specific changes to the American Bar Association's model code.

The recommended changes include:

- A definition of "responsive" bidding that requires the general contractor to list sub-bids with the awarding agency — a curb against bid shopping after the general contract is awarded.

- Amendment to the title on bonds to "Bonds and Security" so that procedures governing the use of retainage could be promulgated.

- An authority for the procurement policy office to specify use of standard subcontracts as well as general conditions, with guiding principles for any such subcontract enumerated.

- Inclusion of subcontractors in the definition of "contractor" when the work is used to explain dispute procedures, provided the dispute relates to the subcontractor's work and the subcontractor is the chief party to the argument.

Nine states that have adopted versions of the American Bar Association's code are: Arkansas, Colorado, Indiana, Kentucky, Louisiana, Maryland, South Carolina, Utah and Virginia.

Fourteen states now drafting codes are: Arizona, California, Delaware, Florida, Georgia, Illinois, Iowa, Michigan, Missouri, New Jersey, New Mexico, New York, Pennsylvania and West Virginia.

Copies of the "Legislative Work Kit for a Model Procurement Code Subcontractor Package" are available from ASA at 8401 Corporate Drive, Landover, Md. 20785. ☉ ● ● ●

Martin Eastman's article, "Keeping a Building Warm (and Dry) With Insulation," (September, 1983) incorrectly stated that cellular glass could not be mechanically fastened. Literature from Pittsburgh-Corning lists specially designed fasteners such as Lexuco from B.F. Goodrich & Co., Insulfast from Berryfast, Inc., Perma-Fastener from Grefco Building Products, Dekfast from Construction Fasteners, Inc. and Gaftite from GAF as being acceptable for use with Foamglas brand cellular glass insulation.

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Associate News

Carlisle Breaks Ground for Third Plant



The SynTec Technical Center for research and development is under construction in Carlisle, Pa.

The three-million dollar, 27,600-sq.ft. facility is the third new plant built by Carlisle Corp. in four years. Construction for a 22,000-sq.ft. adhesive plant began in March 1983 and the Greenville, Ill., elastomeric membrane plant has been in operation since the summer of 1980.

The Center is expected to be completed by May 1984. It will then house seven separate departments of the company, including Research & Development, Quality Assurance, Materials Management, Project & Construction Engineering, Machine & Process Engineering, Industrial Engineering and Manufacturing Control Systems.

In addition, research laboratories will occupy one-fourth of the building and will be equipped with state-of-the-art analytical equipment. The facility will also contain a 1750-sq.ft. training center and conference area designed for roofing applicator and architect training programs.

GAF Promotes Goodman

The GAF Corp. has named Robert A. Goodman director of human resources. He is now responsible for GAF's personnel relations worldwide.

Goodman has been with GAF since 1976. Prior to the new appointment, he was the company's labor counsel and director of equal employment opportunity.

Kucera Named P.R. Manager

Georgia-Pacific Corp. has selected John L. Kucera public relations manager for building products communications.

Kucera will now serve general, trade and internal media and edit *Opportunity*, the Distribution Division's quarterly magazine, in addition to speech writing and research duties.

He joined the firm as assistant public relations manager in 1981.

W.R. Grace Promotes from Within

The W.R. Grace & Co. Construction Products Division of Cambridge, Mass., recently announced the promotion of two employees, John A. Danneker and Jon I. Stone.

Danneker was selected vice-president and general manager for building products. He is responsible for marketing and business management of Zonolite® roof insulation systems, GRM™ roof membranes Bituthene® waterproofing, Monokote® fireproofing, Polycel™ foam sealants and several related insulation product lines.

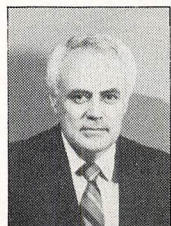
Previously, Danneker was vice-president and general manager for the firm's membrane roofing and waterproofing systems group.

Stone was named central regional manager for building products and will be based in Chicago.

He is responsible for the regional sales of a newly-consolidated product line including Zonolite®, GRM™ Bituthene®, Monokote® and several related product lines.

Prior to this appointment, Stone was central regional manager for Darex® concrete admixtures.

TechniCote Taps Lewis for Presidency



Richard Lewis has been appointed president of TechniCote Corp. in Memphis, Tenn.

Prior to this position, Lewis was the general operations manager of Accra Bond, Inc. He also worked for the Pace Co., a division of Ambac Industries, Inc.

Lewis was graduated from Memphis State University with a bachelor of science degree.

Giuffre Offers Dealer Franchises

Giuffre Bros., Inc. has announced the development of a new dealer franchise program.

The Oak Creek, Wis., firm is seeking qualified dealers — nationwide — to operate under the Giuffre name and policies.

The franchise arrangement will cover equipment, inventory, financial and marketing assistance and sales and service support.

CertainTeed Manager Receives Award

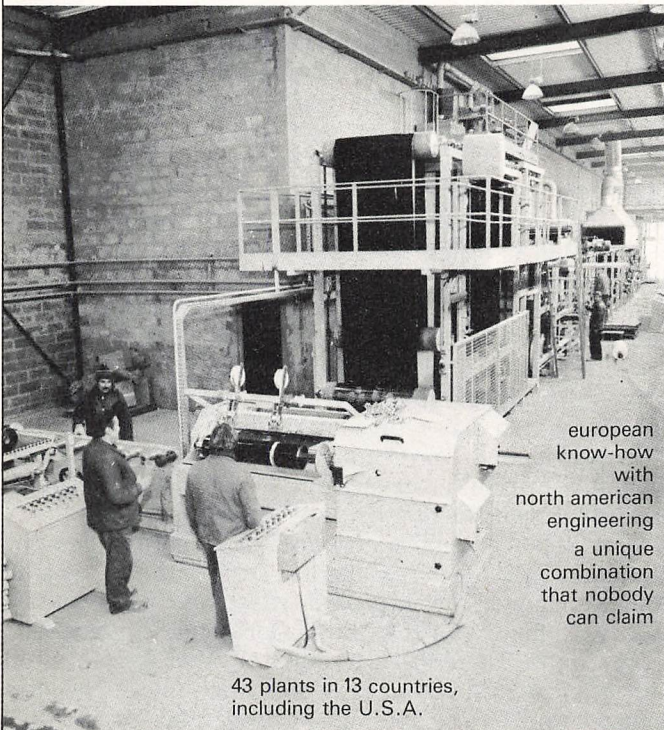


Connie Pollard from the Shelter Materials Group of CertainTeed Corp. has been named the first annual recipient of the "Red Blazer" award by the Fort Worth Lumberman's Association in Texas.

Pollard is the Territory Manager for the Dallas/Fort Worth region. She is also a member of the President's Executive Committee of the Fort Worth Lumberman's Association.

The award recognizes Pollard's active participation within the trade association.

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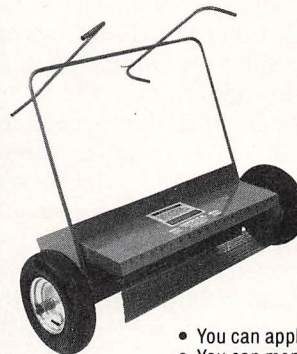
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The Investment Tax Credit: Hidden Tax Break For The Project Owner

Investment Tax Credits regarding certain types of new construction can provide the owner with a very substantial and immediate reduction in tax liability, and yet they are often either overlooked entirely or not fully or properly asserted. Section 38 of the Internal Revenue Code and the Regulations promulgated under that Section clearly preclude any tax credits for the cost incurred for construction of a building and its structural components. However, the courts and the Internal Revenue Service have readily acknowledged that the costs of many aspects of a completed construction project will, in fact, qualify for the Investment Tax Credit permitted by Section 38 and its Regulations for certain types of depreciable property. Depending, of course, on the nature of the project, the tax savings generated by a precise accounting for costs incurred in the construction of *bona fide* Investment Tax Credit type property can be substantial. However, prior recognition of these aspects of the construction project and precise accounting for their costs throughout the course of the project, are necessary to take advantage of the Investment Tax Credit.

The Investment Tax Credit is a credit against Federal Income Tax equal to 10 percent of a business' investment in depreciable property, *other than buildings and their structural components*. Since the credit offsets federal income tax on a dollar-for-dollar basis, the Investment Tax Credit is even more beneficial than accelerated depreciation. To qualify for this 10 percent investment credit, the investment must be in tangible, depreciable property having a useful life of at least three years and fall in one of the following categories:

(1) *Tangible personal property*. This category includes property other than land or buildings and other permanent structures on the land. Examples of property which do qualify include merchandise counters, display racks or shelves and neon signs. Many kinds of machinery are generally treated as personal property, even things located outside of the building and attached to the ground such as gasoline pumps, hydraulic car lifts and vending machines.

(2) *Tangible Real-Property-Like Assets*. Property which would generally be considered real property can qualify for the credit if it is used as an integral part of a manufacturing, production, or extraction operation or is

used as an integral part of an assembly or process for the furnishing of transportation, communications, electrical energy, gas, water or sewage disposal services.

(3) *Research and Storage Facilities*. Property will qualify for the 10 percent Investment Tax Credit if it is a research or storage facility (other than a building) and is used in connection with one of the activities described in Paragraph (2), even if it is not used as an integral part of that activity. A storage facility qualifies only if it is used for bulk storage of fungible commodities. Examples of such qualified property are wind tunnels, test stands, oil and gas storage tanks and grain storage bins.

(4) *Elevators and Escalators*. Investment in an elevator or escalator will qualify for the 10 percent Investment Tax Credit.

(5) *Agricultural and Horticultural Structures*. Agricultural or horticultural structures used for the single purpose of food or plant production will also qualify for the Investment Tax Credit.

In view of the general disqualification of buildings and their structural components as property entitled to the 10 percent Investment Tax Credit, many owners simply fail to realize that, despite this general prohibition, some substantial aspects of a particular construction project may consist of property which is qualified for the Investment Tax Credit. Therefore, an owner investing in new construction should always consider this possibility and identify those various components of the project which may represent qualified investments for the Investment Tax Credit. He should then account separately for his costs incurred in connection with the qualified investment aspects of the project.

For instance, almost any commercial structure today includes elevators or escalators. Costs of these items in any new construction project, if separately accounted for, will qualify for the "dollar-for-dollar" Investment Tax Credit. There are a number of other examples of various components of new construction which have been found by the Internal Revenue Service and the courts to qualify for the 10 percent Investment Tax Credit. Consider the following examples which, although an integral part of the finished construction project, have been determined to fall within the class of tangible personal property qualifying for the Investment Tax Credit:

■ The Internal Revenue Service declared that the cost of wall-to-wall carpeting, installed on concrete floors by fastening the carpet to wood strips nailed along the floor, qualified for the 10 percent Investment Tax Credit as it was determined not to be an integral part of the floor construction itself (Rev. Rul. 67-349, 1967-2 C.B. 48).

■ The Service has also held in a number of rulings that movable wall partitions are not considered to be a structural component of the building and are, therefore, tangible personal property qualifying for the Investment Tax Credit. See, for example, Rev. Rul. 75-178, 1975-1 C.B. 9.

■ An owner involved in bank construction should be aware that the Service has ruled that the cost of bank vault doors, record vault doors, night depository facilities, and walk-up and drive-up tellers windows all fall in the category of tangible personal property and qualify for the 10 percent Investment Tax Credit (Rev. Rul. 65-179, 1965-1 C.B. 26).

■ Indeed, the legislative history behind the Investment Credit Tax concept described tangible personal property eligible for the credit to include exterior symbols and signs, special lighting (including lighting to illuminate the exterior of a building), false balconies and other exterior ornamentation having no more than an in-

Many owners simply fail to realize that some substantial aspects of a particular construction project may qualify for the Investment Tax Credit.

cidental relationship to the operation or maintenance of the building. See Senate Finance Committee Report No. 95-2063.

While many of these items fall into the category of the "finish" aspects of a project, the 10 percent credit to the owner based on the net cost is a potential tax benefit which must not be overlooked.

Tax Credits for Construction Costs

Potentially more important are the Service's rulings and court decisions relating to Investment Tax Credit for construction costs in connection with manufacturing and production facilities, since they are likely to represent an even greater aspect of construction costs. For example, in *Boise-Cascade Corp. v. United States*, 39 AFTR 2d 77-908 (D.C. Idaho 1977), the United States District Court considered the tax consequences of excavation costs incurred in the construction of a framework structure, railroad spur track, dry land log storage area, power supply area, ground wood bleaching tanks, wood preparation structure and paper machine room for a newsprint factory. Since it determined that those costs

of excavation were incurred directly in connection with the construction of property to be used "as an integral part of a manufacturing" facility, the Court held that they were qualified for the Investment Tax Credit. Similarly, the Internal Revenue Service ruled that the cost of a separate boiler facility for steam used primarily in furniture manufacturing qualified for the Investment Tax Credit (Rev. Rul. 70-160, 1970-1 C.B. 7). Perhaps even more expansive is the United States Tax Court's determination that the completion of a primary electrical distribution system, including substations, switch gear, cables and transformers at a 700-acre industrial site qualified for the Investment Tax Credit to the extent that they carried electrical load used in the manufacturing production process. *Scott Paperco*, 74 T.C. 137. This Tax Court decision is consistent with the Service's own ruling in Rev. Rul. 66-299, 1966-2 C.B. 14, that Investment Tax Credits can be taken for the cost of special electrical, plumbing, mechanical or other connections which are directly necessary for the use of specific items of machinery involved in a manufacturing production process, or interconnections between specific items of machinery or equipment involved in the process.

Another common element of new construction for which the Internal Revenue Service and the courts have consistently allowed Investment Tax Credits is in the area of paving costs. The Internal Revenue Service has held that roadways within a manufacturing complex used by trucks transporting raw materials, supplies, finished and semi-finished products qualify for the Investment Tax Credit; however, those used solely for employee and visitor vehicle traffic do not qualify (Rev. Rul. 71-555, 1972-2 C.B. 65). The Service has also ruled that paved parking areas in manufacturing facilities used for truck, trailer or other vehicle parking and paved areas employed as storage facilities of raw material, supplies, machinery and other products, also qualify as investment credit property (Rev. Rul. 72-397, 1972-2 C.B. 8). Along this line, the Internal Revenue Service has also ruled that the cost of paving areas in and around an airport also qualifies for the Investment Tax Credit (Rev. Rul. 69-329, 1969-1 C.B. 30).

Generally, property is eligible for the Investment Tax Credit in the year in which it is "placed in service." According to Treasury Department Regulations, the property is deemed to be "placed in service" when it becomes depreciable or when it is in a condition of readiness or availability for its specifically assigned function, whichever occurs earlier. Thus, on a construction project of several years duration, the full amount of Investment Tax Credit for qualifying aspects of the project may be correspondingly delayed. Regarding property which is considered placed in service during a long period of construction, however, the credit would be available to the extent of payments actually made by the owner of qualifying property. If the taxpayer elects, his qualified investment for a particular year will include an amount equal to his aggregate qualified progress payment made by him in the taxable year on qualifying property. To qualify for such Progress Expenditure Treatment under Internal Revenue Code Section 46, the

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qualifying property must meet two conditions:

(1) It must be reasonable to believe that it will be qualifying property in the hands of the taxpayer when placed in service; and

(2) It must have a normal construction period of at least two years.

Satisfaction of these conditions is determined on the basis of facts known at the close of the taxable year in which physical work on construction of the property begins. The normal construction period is the time reasonably expected to be required to construct the property, beginning with the latter of the date when physical work on construction commences or the first day of the first taxable year to which the election applies, and ending on the date the property is expected to be placed in service. For purposes of this two-year test, property that will be placed in service separately must be considered separately, but property that can only be placed in service as a part of an integrated unit may be treated as a unit even if certain components will require less than two years to complete. If possible, the normal construction period should be estimated with reference to normal industry practice in producing similar items. If all conditions are met, the credits may be taken each taxable year as the work progresses for such property. If

the taxpayer makes such an election, the credit in the year the property is placed in service must then be reduced by the amount of credits already taken.

Tax Credits for Rehabilitation

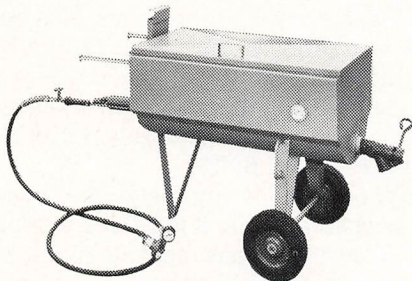
In the area of rehabilitation of existing structures, the rules for tax credits are now even more liberal. While construction costs in connection with a new building or its structural components generally do not qualify for Investment Tax Credit, the Economic Recovery Tax Act of 1981 amended the Internal Revenue Code to provide for a three-tier construction rehabilitation expense investment credit, which became effective on January 1, 1982. The tax credit allowed by this Act is 15 percent for nonresidential structures that are at least 30-years old, 20 percent for nonresidential structures that are at least 40-years old, and 25 percent for certified historic structures. These credits are available only if the straightline method of depreciation (cost recovery) is used for the rehabilitation expenditures.

Under the Economic Recovery Tax Act of 1981, certain expenditures do not qualify for this credit. The cost of acquiring a building, an interest in the building or facilities related to a building (e.g., a parking lot) are not considered as qualifying expenditures. If more than 25 percent of the building's external walls are replaced, the cost of such construction is considered to be for new construction rather than rehabilitation and is subject to the limitations discussed above. Also, any expenditure in connection with enlarging a building does not qualify. Furthermore, expenditures qualify only if a building is "substantially rehabilitated." In order to meet this definition, the qualified rehabilitation expenditures during a twenty-four month period ending on the last day of the taxable year must exceed the greater of (1) the adjusted basis of the property on the first day of the 24 month period or (2) \$5,000. A rehabilitation will also qualify as being substantial if it meets the above requirement by substituting sixty months for twenty-four months, provided that there is a set of architectural plans and specifications for all the phases of the rehabilitation and the rehabilitation is expected to be completed.

Finally, while not dealing specifically with the concept of construction costs incurred by an owner, Energy Conservation Tax Credits may be available regarding certain equipment and material expenditures which would not qualify for Investment Tax Credits or Rehabilitation expense credits.

These concepts present obvious tax benefits for the construction project owner and deserve serious consideration and study in connection with any major construction project. The owner, however, must first be aware that this potential tax advantage exists and formulate his planning, design, manner of contracting, and project accounting system to take maximum advantage of the potential dollar savings accordingly.

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New Armco Z-III structural building system.

Photos courtesy of Armco.

Metal Roofing Merits Attention By Roofing Contractors

by John Stover
Metal Building Manufacturers Association

Metal has been one of the most valuable roofing materials since the days of the medieval armor-makers, whose crowning achievements can be seen in some of Europe's most architecturally-impressive structures.

Were those early "roofing contractors" in business today, they would discover some interesting and dramatic changes in the use of metal covering systems. The steep slope has given way to the flat roof profile. Equally important, advancements in technology beneath the roof have matched improvements in appearance.

There are several advantages in a properly engineered and installed metal roof. Due to the impervious nature of steel, metal roofs are fire resistant. Through years of research and development, they can be uniquely designed to resist the damaging effects of thermal shock. They are relatively light, weighing approximately two pounds per square foot with the purlins. Finally, metal roofs are sold and installed at competitive costs when calculated over the life-span of the building.

Metal roofs are sold alone or as part of a complete building system through dealers and contractors trained by system manufacturers. In recent years, a growing number of general roofing contractors have begun to sell and install metal roofing systems.

Major metal building system manufacturers offer a full line of integrated accessory equipment to go with the building system which includes primary framing and

secondary structural members, as well as wall and roof coverings. The structural integrity in a metal building is best achieved when the components are designed into an integrated system and fabricated by one company.

"The system manufacturer has a thorough knowledge of how the building will behave as a system under various load conditions in its completed state," said Dr. Duane S. Ellifritt, director of Engineering and Research for the Metal Building Manufacturers Association (MBMA). "The manufacturer will stand behind the building's ability to perform as specified in the job contract."

The MBMA's 31 member companies account for some 90 percent of all metal building system sales in the U.S. today. The Association noted that the growing acceptance of metal roofing systems has closely paralleled the expanding markets for metal building systems as a distinct construction form.

A total of 232 million sq. ft. of new low-rise, non-residential construction space was erected in 1982 with metal building systems, according to MBMA. In most of these projects, various types of metal roof systems were used.

This new building activity constituted more than one-half of all the one and two-story structures reported to F.W. Dodge, continuing the metal building industry's dominant market position in low-rise construction. Two-thirds of those buildings were in the commercial, manufacturing and warehouse/material handling sectors. Remaining applications went into municipal facilities, schools, recreation centers and health care services.

In addition to new metal building construction, metal roofing systems are used for new ordinary construction and for retrofitting both metal buildings and buildings erected with other construction forms such as brick, block, bar joist and concrete. In a growing number of these projects, metal roofs were specified by architects and engineers. The ability to vary the slope has made metal roofing systems more popular in office and industrial parks where dress codes may demand concealed roof lines. Also, metal roofing systems can be combined with other materials such as brick, wood, glass and concrete to keep the building's original architectural look intact.

A metal roofing system normally is composed of two components, purlins and roof panels. The purlins support the weight of the roof and transfer any applied loads to the primary structural system.

The traditional system is known as the lap seam or through-fasten roof. The panels are connected to each other by lapping. A sealant is installed between the two panels at the side and end laps and fasteners are used to secure them to the purlins.

The second major type of metal roof is the standing seam. Its original design was introduced in the 1930s. Interest and refinement in the standing seam roof was spurred in the early 1970s by the energy shortage and maintenance problems associated with the tearing and cracking of built-up roofs.

Critical to long-term performance is the ability of the metal roof to respond to temperature-induced stress conditions. Tests have shown, for example, that metal will expand one inch per 20 feet of roof run over the course of 60°F temperature change.

The metal building industry accommodates this movement through the unique design of the standing seam roof. The principal device for connecting the panels to the purlins is a clip concealed inside the seam. The clip has a movable feature which permits the roof membrane to expand and contract with changes in outside temperature.

Because the seam joints can be up to four inches above the roof's drainage plane, the possibility of water runoff from rain and melting snow is greatly reduced. A sealant bead is applied across the entire length of the panel to add to the weather-tight bond.

The potential for heat loss and roof leaks also is reduced because there are fewer through fasteners in the standing seam roof. Fewer fasteners mean fewer penetrations, thereby reducing the potential for problems.

Metal building system manufacturers recommend various methods and materials for insulating the metal roof. Spacer blocks are a recent innovation for improving the consistency of the thermal barrier. These are installed at the points where the insulation becomes compressed against the purlins. This establishes a blocking action and prevents the loss of heat through the roof.

Metal roofs are insulated with spray-on type, glass

"Metal has been one of the most valuable roofing materials since the days of the medieval armormakers."

fiber blanket, rigid board and combinations of these materials. Some system manufacturers offer factory-insulated roof systems with sandwich panels, providing U values in the range of .05.

The trend to more insulation in recent years has produced some unexpected and costly problems with conventional built-up roofs. "With increased insulation, a built-up roof may experience a greater temperature differential than it is designed for," Ellifritt said.

"A built-up roof is not very flexible," he continued. "Tar and asphalt tend to get brittle with age and crack. And the greater the temperature differential, the greater the tendency to crack."

To the building owner, these cracks mean leaks, and leaks cost money. The cost of repairing the roof is just the beginning. Roof leaks also lead to wet insulation and higher energy costs.

This is why large manufacturing and distribution facilities have become prime prospects for retrofitting with the standing seam roof. Companies such as Gates Rubber Company, McDonnell Douglas Corporation and the Glass Division of PPG Industries Canada Ltd. have replaced or covered over existing built-up roofs with the standing seam in recent years.

At Gates, the world's largest manufacturer of V-belts and hose, maintenance costs for its 381,000 sq. ft. Elizabethtown, Ky., plant totaled \$90,000 in 1980. When the company projected 1981 costs at \$100,000, it decided on a long-term solution.

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Metal Merits

continued



Step One — The original built-up roof on the field house was removed down to the decking. Contractors installed a 6 mil polyethylene vapor barrier and a lumber substructure to give the new roof a slight pitch for better drainage.



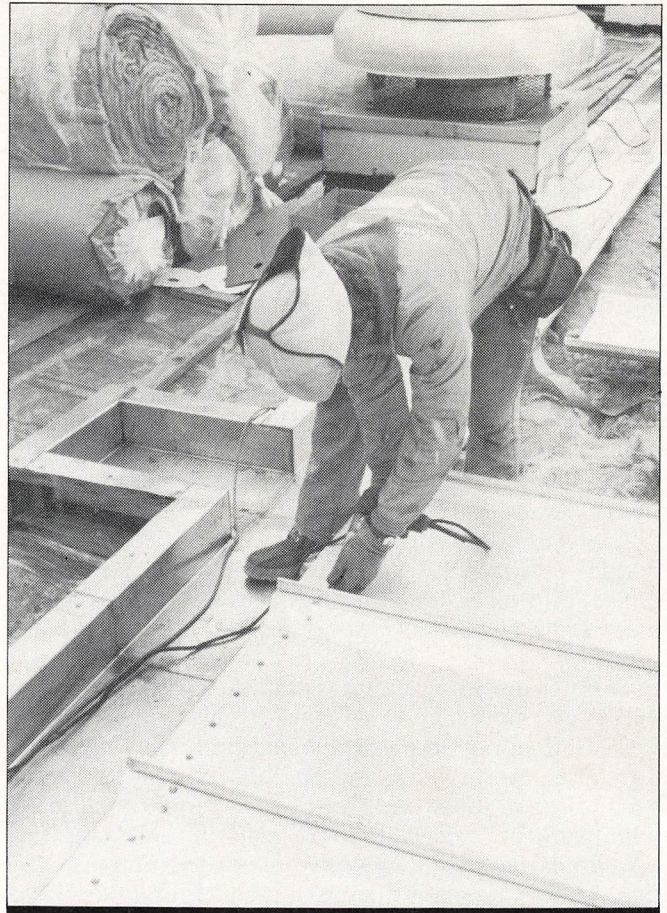
Step Two — Installers placed two layers of 3/4" fiber glass bat insulation between substructure members.

Six inches of new insulation were installed between the old roof and the new metal roof. "We projected we could save \$37,000 to \$50,000 annually in energy costs with the new insulation," said Ray Buresh, Gates' construction project manager.

He cited two reasons for selecting the standing seam metal roof — the standing seam design and the fact that the system enabled the company to install a pitched roof over and above the existing flat built-up roof.

Renovation projects may well have to go beyond just the roof. In Webster, Mass., the turn-of-the-century building complex of Bates Shoe Co. had become dangerously outmoded. Stone foundations, which had been reinforced several times, were failing to the point where some buildings were beginning to settle. Uninsulated wood walls with wide expanses of glass windows were causing energy costs to skyrocket.

Gene Burch, director of engineering for Wolverine Worldwide, Inc., the parent company of Bates Shoe, turned to architect Donald P. Fritz of Ada, Mich. and W.R. Sanders Company, Inc. of Sterling, Mass., a building construction firm. They decided to demolish six



Step Three — A gutter was installed to be compatible with the building's existing internal drainage system.

Photos courtesy of MBMA.

three-story wooden structures, refurbish another with a metal wall and roof system and erect a new 31,000 sq. ft. metal building.

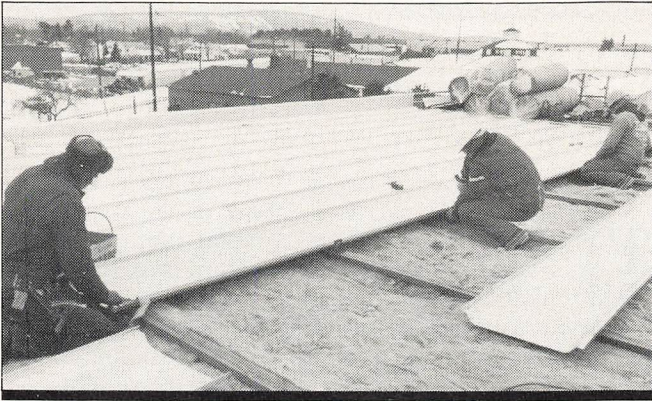
Burch recalled that the structural system remained sound in the renovated building, even though it was uninsulated and laden with windows. "We were able to select an insulated metal wall system which blended in perfectly with our new structure," Burch said.

"With the new construction we kept our square footage of manufacturing space about the same, and we were able to implement improved material handling operations and material flows within the buildings which significantly improved our productivity," he explained.

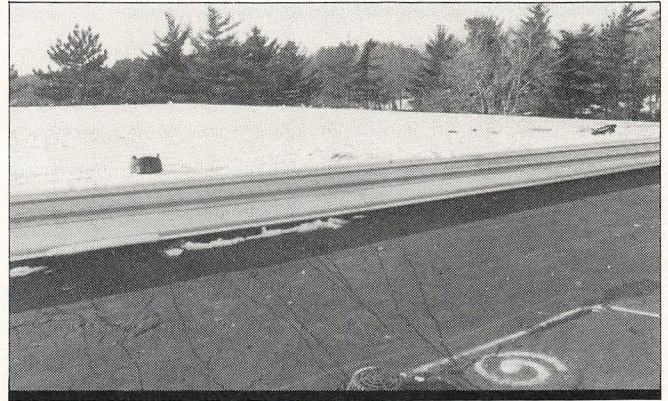
When the new building was completed, the company converted from oil to natural gas. "After one full winter, we know we saved at least 50 percent in our heating costs. On a BTU basis, we believe we saved about two-thirds," he added.

Sales of the standing seam roof have been strong in hard weather climates. At the University of Wisconsin's Wausau campus, a standing seam roof replaced a built-up roof on the school's 25,000 sq. ft., 20-year old fieldhouse.

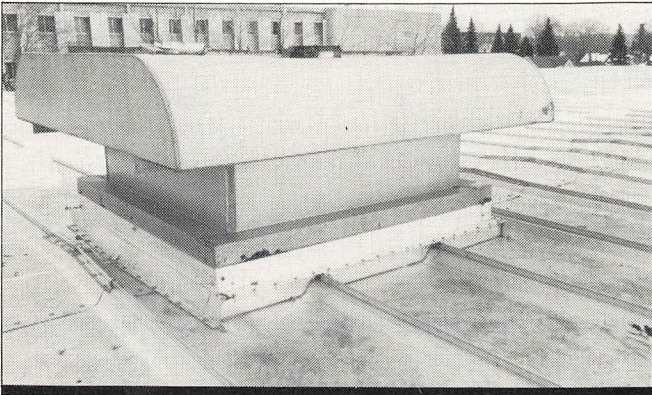
Like the Bates project, there was strong architectural involvement in the Wausau job. Vanderwers & Associates of Wausau designed a system that is compatible with the building's brick and masonry architecture and with its internal drainage system consisting of gutters



Step Four — The standing seam metal roof panels were fastened to the substructure with a series of clips to minimize through-the-panel fasteners.



Step Five — There was no melted snow like the area on the original roof, indicating the effective insulating properties of the standing seam metal roof.



Step Six — The metal roof system allowed for easy adaptation to ventilation fixtures and other roof openings.



Step Seven — The school can expect years of maintenance-free performance from the standing seam metal roof. The re-roofed area totaled some 25,000 sq. ft.

Photos courtesy of MBMA.

and downspouts.

The original built-up roof was removed down to the decking. A six mil polyethylene vapor barrier was installed. Stainless steel gutters were put in place to drain moisture into the original drainage system.

Two layers of 3 1/4" fiber glass bat insulation were added and a lumber substructure was anchored to the building's original aggregate roof panels. The standing seam roof panels were then fastened to the substructure.

The flexibility of the metal roof allowed it to be easily adapted to standpipes, ventilation fixtures and the parapet that runs around the building. Because it could be installed in stages, the project did not interfere with the building's normal use.

The system designer estimated that the installed cost of the metal roof was \$.75 per square foot less than other applicable roof systems.

Building system manufacturers conduct thorough training sessions on correct installation procedures for their roofing products. Classroom lectures usually accompany slide presentations or video-tape demonstrations. Where possible, contractors are taken to a job for on-site training.

On retrofit projects, all plans should be reviewed by a certified engineer to see that the building will support the additional dead load from the new roof. Before beginning the job, a precise layout should be drawn, showing the exact size and locations of the roof penetrations.

This will help assure a snug fit of the metal panels around roof openings and ventilation fixtures.

The size of the installation crew will depend on the project and the desired completion date. Normally, an experienced metal roofing contractor with a four to six man crew can install a standing seam roof on a 70' x 150' building in three days.

Metal roofing contractors estimate 1.66 man hours per square for new construction. In retrofit work, the estimated time is 2.6 man hours per square. Here again, time will vary depending on the job requirements and condition of the existing roof.

The market for metal roofing systems should be an attractive one in the years ahead. Annual new metal building construction has averaged about 325 million sq. ft. for the last five years.

The standing seam roof will command a bigger share of the retro-fit market which will total about 1.2 billion sq. ft. in 1983, according to Ducker Research Co. of Birmingham, Mich.

"There is particularly strong interest in the standing seam roof where an architect is involved in the retrofit project," said William H. Ducker, president of the firm.

For additional information on metal roofing systems, contact the Metal Building Manufacturers Association at 1230 Keith Building, Cleveland, Ohio 44115.



Metal Roofing Offers Wide Variety of Durable Choices

by Martin Eastman

The clean soaring lines of a metal roof can add a dramatic accent to almost any building. But that's not the only reason metal's being used on more and more new and reroofing jobs these days. Architects, specifiers and contractors are using metal to add low maintenance durability to their buildings along with good looks.

Over the years, craftspeople have devised many different sheet metals, coatings and roof systems to protect and enhance their buildings. Copper, lead, zinc, aluminum and steel have all been pressed into service as roofing material. And systems such as the standing seam roof have been fabricated to foil the threats of time and weather.

Most of the metals and methods developed in the past are still in use today, while modern technology has made its own improvements and additions to the line up.

Each of these roof systems, whether ancient or modern, has its own characteristics. Color, texture and shadow line contribute to each system's distinct personality.

***Color, texture and shadow
line contribute to each
system's distinctive
personality.***

Color, for some roofs, is a planned process of weathering and corrosion. As exposed aluminum, copper and zinc react to chemicals in the atmosphere, each forms a thin film of oxides on its surface. The corrosion not only causes the roof to change color but also helps to inhibit further corrosion as well. As the rich patina develops, protection against pitting and chemical consumption increases for the metal underneath.

Copper, one of the most durable metals, goes through many stages of corrosion on its way to the mottled green of fully-aged metal. Starting out salmon pink, copper moves through various shades of brown as first oxides and then sulfides form on its surface. The basic blue-green patina is actually copper sulfate and is the only film that is truly corrosion resistant.

Copper may take from 25 to 30 years to reach the final stages of weathering. This time frame depends on both the amount of sulfur and the amount of moisture in the atmosphere where the roof is located.

Copper may be "aged" chemically to achieve the blue-green patina in a matter of weeks rather than years. On the other hand, the bright color of new copper may also be preserved with special coatings.

Zinc and aluminum form oxides which inhibit further corrosion. In fact, the oxidation rate for aluminum is actually faster than that of iron. However, the oxide film

that forms is so impervious that further corrosion is quickly stopped.

Aluminum changes little in color as it weathers. Zinc, on the other hand, ages to a uniform gray in about a year. Pre-weathered zinc alloy panels are also available.

Stainless steel, another metal which may be left exposed, protects itself a little differently. While the

Creating a durable, water-tight roof is the work of the entire system.

chromium in the alloy forms a protective shield on the surface, the nickel the metal contains provides further rust protection. Because of this added defense, stainless steel changes little in appearance as it weathers.

Plain carbon steel, the most widely used roofing metal, must be coated with another material to withstand corrosion. Paint, other metals and ceramic coatings are all used and their choice, like the choice of metal itself, will determine the appearance and performance of the roof.

Galvanized steel, steel coated with zinc, is the most familiar type of coated stock. The zinc acts as a "sacrificial" metal, giving itself up to corrosion and protecting the steel underneath.

Zinc-galvanized steel is also "self healing." Scratches on the surface of a galvanized sheet will "heal over" as the zinc coating migrates into the exposed area.

Aluminum is also used as a protective coating. Unlike zinc, however, it is not sacrificial and will not continue to corrode away once its oxide film has formed. This helps the aluminum coating protect the steel over years of exposure.

Zinc and aluminum are combined and used as a coating by some manufacturers. This offers the durability of the aluminum with the self-healing properties of the zinc.

Terne, an alloy containing lead and tin, is used to coat steel by some manufacturers. Like zinc, this coating protects the steel with a sacrificial action. Unpainted panels weather to a uniform gray.

While a raw metal look may be desired on some buildings, metal roofs are most often painted. Here again, a wide variety of choices is available. Finishes varying in degrees of economy and durability are offered. Some manufacturers may offer more than one kind of finish to help designers and contractors fit both budget and maintenance requirements. For roofs exposed to particularly harsh environments, specially formulated finishes may be available.

Finishes come in a wide range of architectural colors to match almost any design scheme. It may be possible to obtain custom colors, though some manufacturers

may restrict this service to quantity orders.

Most finishes are baked on in a two-stage process with the first stage being a primer coat. This is generally done to the metal before it is formed into roof components.

When a metal roof is installed, it is necessary to protect it from further corrosion at the points where the metal membrane meets with dissimilar metals and masonry. To separate the roof from these potentially corrosive contacts special coatings, gaskets or wood strips may be used. It is best to consult the manufacturer for the proper method of separation.

Corrosion resistant metal panels may eliminate one problem, but creating a durable, watertight roof is the work of the entire system. The problems of thermal movement and water intrusion must be dealt with at the roof's seams and attachments.

There are various methods of fastening metal pans together to form a watertight membrane and attaching that membrane to support members. Each of these methods not only helps to keep water out but also gives the finished roof its distinctive shadow lines.

Most manufacturers offer some type of seaming system. The panel edges are formed to interlock with each other or accept a clip-type fastener. These interlocked panels are then crimped or fastened together at the job-site for a tight seal.

The traditional lap seam is the simplest. In this type of roof system, the panels are lapped on the sides and the ends. A sealant is applied between the panels, and they are stitched together with screws. The fasteners also penetrate the roof membrane and attach the roof to the substrate. This type of roof is best for shade and shelter type buildings requiring minimal protection such as open shops, garages or barns.

Most manufacturers offer a wide range of architectural colors.

A variety of other seams are available for buildings requiring more protection. These include flat-lock seams, standing seams, batten seams and shingles. All attempt, in some way, to protect the fasteners themselves from exposure and corrosion and reduce the number of penetrations through the roof membrane.

A flat-lock seam is most often used on low pitch roofs, domes or towers. The pans are attached to the substrate with cleats which are then covered with adjacent pans. The finished seams are malletted and soldered or sealed.

The standing seam combats several problems at the same time. It is one of the most widely used metal roof-

continued on following page

Choices

continued

ing systems.

There are several ways of forming standing seams. Single lock, double lock, single crimp, bulb, capped and mechanically interlocked systems are available from various manufacturers. The principle behind all of the seams is to crimp or clip the panels together to form a seam which stands one or more inches above the roof line. This keeps the seam out of the water the pitched roof sheds.

Clips or cleats, used to fasten the panels to their supports, are crimped into the seam itself. This eliminates the problems caused by roof fasteners penetrating the

Installing a metal roof system can be a simple operation with pre-engineered materials.

membrane.

In many systems the clips attach to supporting purlins in a flexible fashion creating a roof which "floats" on its supports. These floating connections are capable of accommodating a roof's expansion and contraction without tearing out.

Another roof system, growing in popularity, is the batten seam system. The batten seam roof features a wider, squarer seam than the standing seam roof. The seam is formed by capping the upturned edges of the panel with a metal cap. The cap either crimps on or snaps onto the panels.

The upturned edges of the panels butt up against the sides of a wooden batten board or a specially shaped fastener. In either case, the board or fastener is attached securely to the substrate before the panels are installed.

Accommodation for thermal movement is built into the batten seam design. In one way or another, the seam is formed with space between the flat of the pan and the batten. This allows the panel to move yet remain tightly fastened to the substrate.

As in the standing seam roof, the fasteners are concealed and protected, greatly reducing the number of roof penetrations.

Also available from some manufacturers are metal shingles. Formed into the shape of wood shakes or clay tiles, they provide traditional looks with the durability and fire resistance of metal. Metal shingles are offered in several colors of baked-on finish or granules.

Installing a metal roof system can be a simple operation with pre-engineered materials. Manufacturers, working from building specifications, are able to pre-form panels and, in some cases, flashings and details as well. For the work crews, the job is simply putting the pieces together.

To help the crews form strong, watertight seams, electric seam formers have been developed. These small electric machines straddle the seam and crimp the edges together as they roll along the seam's length.

Contractors with sheet metal experience, on the other hand, may choose to form the entire system, including the panels and flashings, at the site. This allows the contractor to custom form the roof to the building. It also eliminates the problem of transporting long, pre-formed panels to the site.

The ease of pre-engineering and the custom fitting of site forming may be combined in a couple of ways. Some contractors may use their own crews to install pre-engineered panels but leave the intricate flashing details to sheet metal mechanics. Or, manufacturers may provide on-site engineering services. In this case, the manufacturer uses mobile equipment to form the metal components.

With the look of metal roofing becoming popular, more and more metal roof systems are being used on reroofing jobs as well as new construction. In many cases the support system provides the necessary pitch to avoid standing water on the metal panels.

With the advent of pre-engineered, easy-to-install metal roof systems, it is now possible for most roofers to enter the growing metal roofing market. Carefully scrutinizing the different manufacturers and systems out there will help you find the right one for your needs.



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Part I

Organizing Your Marketing Effort with a Marketing Information Data Base

by David Currin and Cara Roy
Fails Management Institute

What do you think of when you hear the word "marketing"? An advertising campaign? Coupons for a 25¢ discount? The Schlitz malt liquor bull smashing through the walls of a bar? Sales calls? Efforts to get your firm on a qualified bidders list? Even though these tactics are completely different, developed to increase sales of completely different products, they all share one common concern. How do the firms develop intelligence about what kind of advertisement, TV commercial or sales promotion will be effective at influencing their different target markets?

All firms with sophisticated marketing departments track the products bought by past customers, who those past customers were, and what kind of marketing techniques brought sales responses from the customer base. They develop information about potential customers — wants and needs, amount of spendable income, buyer preferences in terms of packaging, etc. Now, you may be saying, "That's fine for Procter & Gamble, Colgate-Palmolive or General Mills, but what kind of marketing information can I develop along those lines to help me sell construction services. Most of my work is low bid, hard money contracts."

Selling construction services is a more complex process than selling consumer products. Each sale is large, and the buyer's decision process includes the consideration of many different factors. If you, the seller, had an organized system for understanding which factors are important to different buyers, wouldn't you increase your chances of successfully closing the sale? That's what a marketing information system is all about — a way for you to know and track those things that please your customers, that eventually sell your contracting services.

In academic terms, a marketing information system is an "integrated, analytic, systematic approach to identifying, assembling, processing and communicating pay-off-relevant marketing information to decision-makers." We're going to call this information system a Marketing Information Data Base or MIDB.

Everyone in business has some sort of MIDB, even if you've never thought about it in those terms. You know

"Everyone in business has some sort of Marketing Information Data Base (MIDB)."

what your product is and who might be a prospective buyer. If you're a mechanical contractor, you don't waste your time making sales calls on insulation contractors but rather go to general builders, construction managers, other prime contractors or perhaps owners. You know who your past customers are — where you've made money, who was hard to work for, who didn't pay promptly. A manual system may be all your company needs. There are some available at office supply houses which give you limited selection capability by the way they are physically put together. The important concern is to keep whatever you have up-to-date. Maybe you're keeping all that information in your head or maybe you have a Rolodex file or a card file, but you do have an MIDB.

continued on following page

Marketing

continued

Now with the low cost and ease of use associated with personal computers and microcomputers, almost every business person has the opportunity to build a fairly sophisticated MIDB. This article will concentrate on computerized systems because they are becoming more and more prevalent and affordable. Maintaining your MIDB on a computer allows you to track much more information than you have in the past and to cross-section your customer base in many different ways. The value received is in your customer's perception of you as a reliable and professional contractor because of your individualized and accurate marketing approach.

Basically, there are two areas of management responsibility where an MIDB is a valuable tool. The first is time and territory management for effective marketing — managing your business development people. What should they do and when should they do it? How effective are they? Performance measurement.

The second way management uses an MIDB is to statistically analyze the firm's customer and product base. What are your growth potentials? How do those potentials affect your strategic planning for developing your company's resources? What actions are you going to take to make sure that your firm realizes its growth potentials? How will you access your target market to exploit opportunities that may be there for your company?

“Now with the low cost and ease of use associated with personal computers and microcomputers, almost every business person has the opportunity to build a fairly sophisticated MIDB.”

Look at Exhibit 1. The pyramid represents your marketing effort from your target market at the base to closed sales or customers at the tip. Perhaps you set yourself a goal of selling and producing \$10,000,000 of construction services during the year. Your average job size is \$500,000, so to achieve your goal you have to sell twenty jobs. Usually, you are able to get one out of every five jobs you actively pursue which implies that to get twenty jobs you must make 100 bids, proposals or presentations.

And, out of every ten jobs you find out about, only three are the kind of work that you want to bid. So you now have to find 333 prospects to be able to weed out the 100 jobs you are interested in. And, out of the potential buyers' population, only one out of twenty is doing suitable work — the right size, type or time frame to be responsive to your marketing efforts. So, your target market is now 6,600 suspects. In other words, if you were

starting from scratch to sell twenty jobs of \$500,000, you would have to initiate some contact with 6,600 potential buyers.

You can probably see the tremendous power of an organized MIDB in accessing your market and exploiting your opportunities. You can get status reports on your activities; you can find out what your conversion rates are; most importantly, you can measure your progress towards accomplishing your goal. Use Exhibit 1 as a worksheet and fill in numbers appropriate to your firm for an idea of the marketing effort you may need to generate.

“This new concept of market segmentation concentrates on user or customer behavior patterns rather than factual data such as size, type of work or location.”

Customer Analysis

Let's discuss first the analysis of your customer base. Customer analysis is a relatively new activity for construction contractors. The industry is changing; customers are becoming more selective, more discriminating buyers; markets continually shift from public to private, from industrial to commercial and back again; large firms are controlling more and more market share. Contractors are finding that they need to redefine existing customer bases as well as identify new ones.

Customer analysis is actually a system for segmenting your market. Criteria for identifying market segments can broadly be stated in the following ways:

1. All members of a segment have the same needs for a particular product or service.
2. The marketer's cost of reaching each customer within a segment is approximately the same.

The question you, the marketer, want to answer is, “What is there about my potential customers and their requirements that really makes a difference as far as the sale of my services is concerned?”

The way you choose to segment your market allows you to answer this question so that you can individualize your selling approach. You certainly don't want to spend as many dollars selling to someone who doesn't recognize your name as you do in making a proposal to a longstanding customer.

Market segmentation has always been a usable concept. You have probably long been separating your customers by their annual purchase volume or the size of the jobs they do, location or type of work. These traditional forms of segmentation are still valid and valuable, but we're coming to realize that there are newer ways of segmenting markets that perhaps are more helpful in establishing an effective sales approach.

You might want to segment according to whether or not that customer has routine jobs where you can compete on price because of your expertise in that kind of

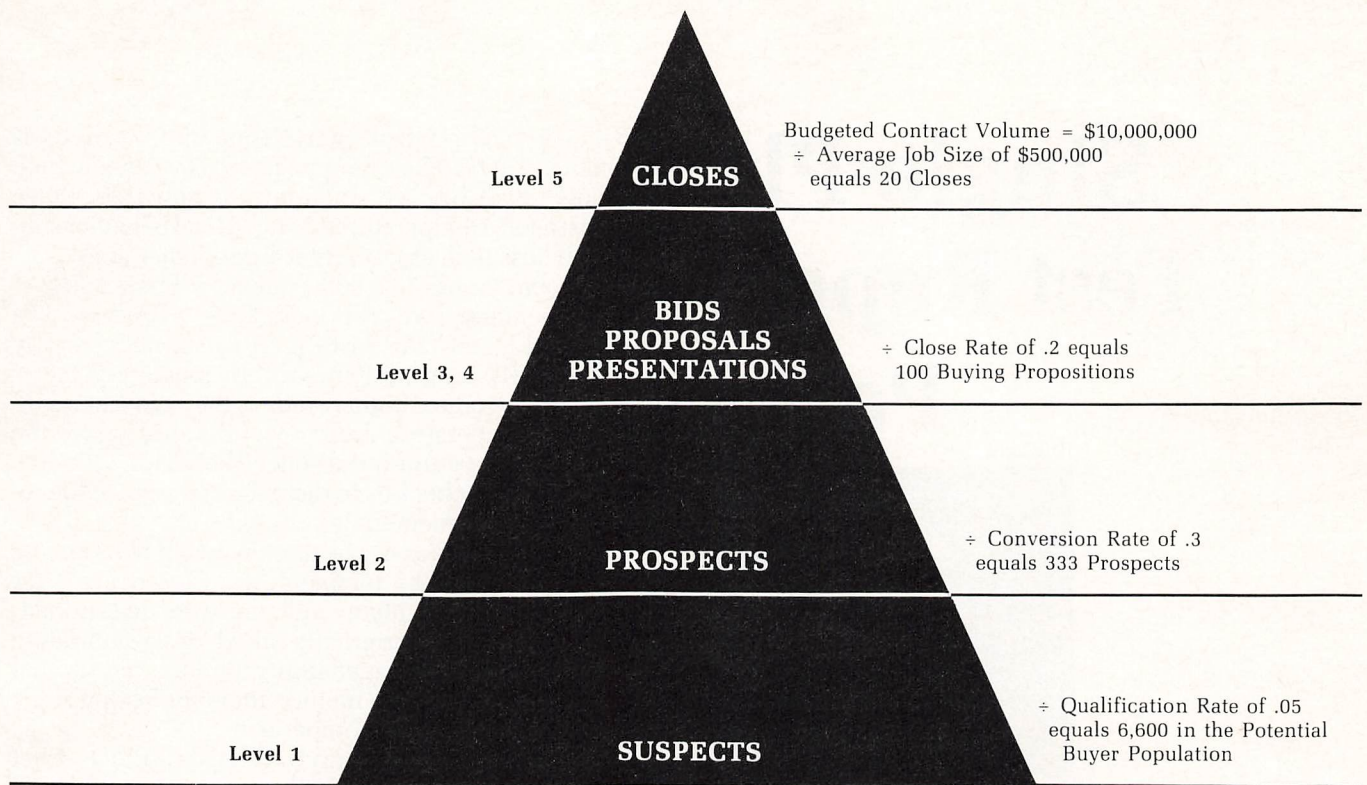


EXHIBIT 1: Quantifying the Marketing Effort

work. You would probably want to use a different approach for a customer who has stringent technical requirements and is very quality conscious. Perhaps it's the delivery time that's important or the technical assistance you can provide. You may want to segment on customers, contracts, prospects or suspects discussed earlier to know what kind of marketing effort would be appropriate to move each segment to the next higher level.

This new concept of market segmentation concentrates on user or customer behavior patterns rather than factual data such as size, type of work or location. In

“Customer analysis is a relatively new activity for construction contractors.”

order to track and record all the information you need, both traditional and non-traditional customer information, you need an organized MIDB.

The information you can maintain in an MIDB also allows you to undertake another approach to selling work that is fairly new to construction — building relationships with customers rather than seeking individual jobs. Long standing relationships provide the opportunity for repeat work and all the advantages associated with that.

Analyzing your customer base and segmenting ac-

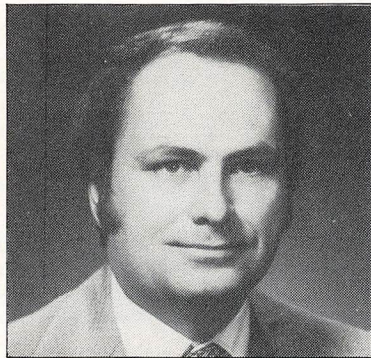
ording to more unusual criteria will help you keep relationships alive and flourishing by paying the right kind of attention to each customer. In this case, the segmenting criteria might be the frequency with which you should make sales calls. Or, which customers appreciate personal attention like birthday cards or Christmas gifts? Or, who can you influence during a game of golf or a night on the town? Who are your most active customers? Who are your contacts? Who have you heard about but never approached? The 80-20 rule applies — 20% of your customers will account for 80% of your business, and you'd better be sure you're taking good care of that 20%.

Building relationships and doing repeat work is a stable anchor for any business. But for an aggressive contractor, there will always be big projects — special projects that you really want to pursue. A well designed and well maintained MIDB can be an invaluable aid in getting that big job. You can look at your customers by key criteria to determine whether your strategy for a selling situation should be no-frills, absolute lowest price; seducing the customer by providing a view of a traded-up project; a demonstration of your experience on that kind of job; or buying affection with travel and entertainment. Some customers may fit your company strategy, others may not. Your MIDB will allow you to make those selections according to past history, not guesswork, thereby increasing your chances of success.

Learn more about the Marketing Information Data Base System in part two, slated for the December issue.



Single-Ply Test Report Part I



by Rene M. Dupuis, Ph.D., P.E.
Vice President,
Structural Research, Inc.

The NRCA/MRCA Joint Task Group sponsored testing on containment, puncture and temperature-induced load behavior for single-ply roofing systems; the results are reported herein.

Although the test program was varied in nature, slow but steady progress is being made toward the characterization of single-ply materials. This undertaking will ultimately assist the drafting of a performance specification for these systems.

In this issue, we will look at the temperature-induced loads and the contamination test results; in December, we will report on the puncture study.

“Progress is being made toward the characterization of single-ply material.”

Temperature Induced Loads

When a roof membrane system is subjected to a temperature drop, it will by necessity contract and tend to apply a mechanical load to the flashing and/or insulation system it is attached to. With single-ply membrane systems, we have found that the low temperature behavior, on a pounds-per-inch basis, was substantially below that of a built-up roof system. In fact, a built-up

roof may induce a load of eighty to one-hundred pounds per inch at -30°F. The different generic systems, which are now available as single-ply membranes, have demonstrated a temperature-induced load behavior substantially less than asphalt built-up roof membranes.

This behavior has two consequences: First, a single-ply roof membrane which is loose laid will only apply a mechanical load to the flashing. If we do not carefully design the flashing system, certain single-ply membranes will introduce higher loads as they age when subjected to a temperature drop. Secondly, testing for the change in temperature-induced load behavior will serve as a quantitative check as to the potential service life remaining in some membranes.

These points can easily be demonstrated by referring to Table 1, where the temperature induced loads for eight different single-ply membranes were determined. The test program had originally called for six samples to be tested. Due to the availability of some additional sheets, it was decided to include them for testing since they offer an interesting comparison.

Specifically, the Polyvinyl Chloride (PVC) sheet membranes demonstrated similar temperature induced load behavior for different thicknesses (see Sample Numbers 1, 3 and 4). The thickest sample (48 mil, installed in 1978) produced a 10.3 percent higher load than the new 48 mil sheet (see Sample Numbers 3 and 4).

The test results point out the vast differences in behavior for various systems.

The 32 mil PVC system, which failed, had increased its load approximately 340 percent over a 32 mil PVC, which is aging but still working well (see Sample Numbers 1 and 2). Based on the above results, we can now see why a PVC membrane will pull flashing attachments as it ages unless the attachments are well anchored.

Furthermore, if we build the data base on failed PVC membranes and they are shown to generate roughly 30 pounds per inch at -30°F (according to this test), we can then test other working PVC membranes and see how far they have progressed toward this nominal 30-pounds per inch value (at -30°F). Based on our previous work, which was published at Brighton, we can say that most PVC sheet membranes start out at 6-to 10-pounds per inch at -30°F when new. Consequently, any PVC membrane which is observed to “tighten up” in the field can be evaluated by subjecting a large sample to this test and observing what the temperature-induced load (at -30°F) is.

The elastomeric materials such as Ethylene Propylene Diene Monomer (EPDM) and Neoprene were found to be rather inert to temperature change. This is demonstrated

by the results of Sample Number 5, which is a three-year old EPDM 42 mil loose laid system. As shown from the test results, a temperature of -30°F elicits very little mechanical response from this particular sheet.

Three new modified bitumen sheet systems were tested. The system was tested as a loose-laid membrane to study the inherent temperature-induced load behavior of the candidate membrane by itself. Although these three systems are specified as totally attached or adhered membranes, we felt it necessary to first document and understand the behavior of the sheet itself. As shown in the results, there is a threefold difference in the behavior of these membranes at -30°F. This test does not, of course, check or determine the ultimate elongation or tensile strength properties. Rather, it simply determines the temperature induced response which the sheet membrane must generate in its response to a temperature drop.

The test results as shown can serve to point out the vast difference in behavior for those various systems. While this is not a thermal shock test, it does provide quantitative data relating to the elementary laws of physics with regard to thermal contraction. It is felt that this approach is more meaningful than a computational approach since the modified bitumens are true composites; EPDM's and PVC's are chemical formulations of

a proprietary nature. Therefore, any computational effort at predicting contractual forces must in and of itself be knowledgeable of the formula and production pro-

“With single-ply membrane systems, we have found that the low temperature behavior, on a pounds-per-inch basis, was substantially below that of a built-up roof system.”

cess.

This data also serves to help a contractor and designer effect an economical and well-understood flashing attachment system for these materials. It is obvious that an EPDM loose-laid system will not require the extensive fastener arrangement that a PVC system might need.

continued on following page

TABLE 1: Temperature Induced Loads (lb/in)

Sample Number/Type	Test Temperature (°F)							
	70	50	30	10	0	-10	-20	-30
1. PVC - 32 mil Installed 1976	0.0	0.2	0.5	1.2	2.0	2.6	4.2	6.4
2. PVC - 32 mil Installed 1975, Failed 1980	0.0	0.9	3.3	7.5	11.6	15.0	21.2	28.1
3. PVC - 48 mil New	0.0	0.3	0.6	1.1	1.6	2.7	3.1	6.8
4. PVC - 48 mil Installed 1978	0.0	0.3	0.7	1.5	2.2	3.7	5.0	7.5
5. EPDM - 42 mil Installed 1978	0.0	0.2	0.3	0.4	0.5	0.5	0.6	0.8
6. Modified Bitumen [†] New - 110 mil Aluminum Surface	0.0	0.9	2.4	4.9	7.1	9.5	13.6	21.2
7. Modified Bitumen [†] New - 130 mil Granule Surface	0.0	0.4	1.1	2.2	3.1	4.7	7.4	11.7
8. Modified Bitumen [†] New - 65 mil Polyethylene Surface	0.0	0.6	1.4	2.5	3.5	4.6	5.3	7.3

* Tested in horizontal chamber 30" x 60" bed size; all materials loose laid over insulation board, no ballast, all samples tested in cross machine direction, anchored into chamber testbed with specified flashing details to the extent possible. Samples were pre-conditioned for test by using a 24 hour cycle of room temperature up to 150°F (12 hours) and then a gradual drop to -30°F.

† See Note A on page 34.

Single Ply

continued

NOTE A: The modified bitumen sheets tested are, of course, fully adhered when installed to their specification. To determine their own inherent behavior to temperature change they were tested unattached, similar to loose-laid membranes. Future testing should address itself to the effects of fully attaching the membranes to different insulation boards or built-up roof (BUR) membranes.

The test data can help the contractors and designers to devise an economical and well-understood flashing attachment system.

Chemical Contamination

Single-ply roofs are subjected to the same environments as BUR membranes. Some single-ply materials may be more (or less) resistant to chemical contamination than BUR's or other single-ply materials.

Chemical contamination may result from rooftop equipment or building maintenance activities. This work is normally done by other trades, without the roofing contractor being present to approve or disapprove of the chemicals being used. Furthermore, certain processes (food, chemical) and manufacturing activities may cause different types of chemicals to be deposited on a single-ply roof membrane.

To assess the effect of some of these chemicals which

may contaminate a roof, a test program was designed wherein a known contaminant was placed on samples of roof membrane and then subjected to 158°F (70°C) over varying time spans. The contaminants were samples of compressor oil (which is also suspended in freon 11), lactic acid (as found in milk plant or milling operations), lithium grease, vegetable oils with fatty acids, sulphuric acid, stain removers, masonry cleaners and mortar sealers. Most of these materials are available over the counter at any industrial supply warehouse.

Additional contamination studies involving coal tar and asphalt were undertaken, including a coal tar built-up roof specimen, as well as asphalt and coal tar samples. The results are shown in Table 2.

Next month, Part II: "Puncture Study of Single-Ply Roof Membrane Systems"

Dupuis obtained his B.S., M.S. and Ph.D degrees in Civil Engineering from the University of Wisconsin-Madison. He has worked for the National Science Foundation, the University of Wisconsin and was also an Assistant Professor at the State University of New York, Buffalo. He is currently a principal and Vice President of Structural Research, Inc. of Madison, Wisconsin.

Since 1974 Dr. Dupuis has been involved in materials research, with emphasis on built-up and single-ply roofing systems. He has participated in numerous roofing conferences throughout the U.S. as well as the International Symposium on Roofing Technology held in Brighton, England in 1981. He has written and presented many articles on roofing technology and has conducted numerous investigations for building owners, architects, manufacturers and contractors.



TABLE 2: Summary of 72 Hour Contamination Results

Contaminant	Asphalt BUR	Coal-Tar BUR	Homogeneous Material		Modified Bitumen Composites					
			PVC	EPDM	Aluminum Topping		Granule Topping		Polyethylene Topping	
					Top Surface	Modified Bitumen	Top Surface	Modified Bitumen	Top Surface	Modified Bitumen
Control	VL	N	N	N	N	VL	N	VL	N	VL
Compressor Oil	M	N	VL	S	N	S	N	S	N	M
Lactic Acid	VL	VL	N	N	VL	VL	N	VL	N	VL
Lithium Grease	M	S	VL	S	N	VL	N	VL	N	VL
Masonry Cleaner	M	N	VL	N	S	VL	VL	VL	N	VL
Mortar Sealer	S	N	VL	VL	VL	S	N	S	N	S
Stain Remover	M	N	M	N	N	VL	VL	VL	N	VL
Sulphuric Acid	VL	N	M	VL	N	M	VL	VL	N	VL
Vegetable Oil	M	VL	VL	M	N	VL	N	M	N	M
Asphalt	—	IC	M	N						
Coal-Tar	IC	—	S	N						

Test conducted in convection oven at 70°C (158°F), sample membranes 2" in diameter, contaminant spread and/or wiped across surface of sample.

Notes: N - No Degradation
 VL - Very Little Degradation
 M - Moderate Degradation
 S - Severe Degradation
 IC - Incompatible



“ MR. PRESIDENT, I NOMINATE . . . ”

A message

to all

NRCA members

from

Fred Good,

Executive

Vice-President

59104. We'll make sure that you receive the necessary data sheet for your nominees.

PIPER AWARD

The highest recognition that NRCA can present is the Piper Award. The Awards Committee must select an individual who has given distinguished service to the Association and/or the industry. Sam Piper, last year's recipient, is the committee chairman.

Your recommendations are sincerely solicited. There are many who have provided distinguished service, and the committee would like to know who you think deserves this recognition.

Again, write to me at NRCA or to Sam Piper at J.A. Piper Roofing Co., Box 8456, Greenville, S.C. 29604.

This is your association . . . your leadership represents you . . . please participate.



Each year, NRCA requests nominations for officers, directors and the Piper Award. This is an opportunity for members to have input into the selection procedure. NRCA is a responsive organization, and your committees really do want and need your recommendations. Let us hear from you!

NOMINATIONS

The Nominating Committee will be selecting 16 contractor directors, three vice-presidents and one senior vice-president. The nominating procedure has been refined over the last few years. The committee now requires a background data sheet on each nominee. The committee then contacts each nominee and secures from him a statement indicating his willingness to be slated and that if slated and elected, he will serve.

This is a sound procedure, but it does require some extra effort on the part of the member making a rec-

ommendation. This extra effort does, however, give the Nominating Committee excellent information on each nominee, thereby helping them to select representative leadership for the association.

Please give the nominating process some careful thought, and let us have your opinion on the matter. You can write directly to me at NRCA or to Committee Chairman John Bradford at Bradford Roofing & Insulation Co., Box 20502, Billings, Mont.

Radonich Roofing Recognized For Safety

Radonich Insulation & Roofing and its affiliated firm, General Roof Supply, Inc., were recognized recently for "outstanding achievement" in roofing safety.

The San Jose, Calif., firms were honored for their injury frequency rate which was less than one-third of the industry's national average over a two-year period.

Pictured from left are: Roy Barber, Jack Healey Insurance Agency of San Jose; Dan Scheutz, Homeland Insurance; Andrew Radonich, president, and Randolph Radonich and A. Scott Radonich, vice presidents of the firms.



New Members Are Only a Phone Call Away

NRCA Phone Days are the association's most popular method of membership recruitment. Two of the four sessions planned for fall have already taken place, and the numbers look good.

The results of September and October's hard work? Membership has now surpassed the 2,600 mark.

This is the earliest that NRCA has held its phone days, and September could become the annual kick-off date.

"The prospects have been more responsive than in the past," said Anna Leonhardt, member services manager.

"It could be because the economy is better than last year or that by starting earlier, we reached contractors while autumn business was still brisk."

Phone Day Chairman Bennett Hutchison, III of Tip-Top Roofers, Inc., Atlanta, Ga. and the following contractors participated in the Sep-

tember 13 drive: Doug King of Tip-Top Roofers, Inc., Atlanta, Ga; Mike Pierce of Sellers & Marquis Roofing Co., Kansas City, Mo; William T. Fort, Jr., of Fort Roofing & S/M Works, Sumter, S.C; Jay Refieuna of James Mansfield & Sons Co., Inc., Lyons, Ill; Richard Marubio of Raincoat Systems, Inc., Broadview, Ill. and Gerald Longerot of Slatile Roofing & S/M Co., Inc., South Bend, Ind.

Ninety-Seven prospects were reached and information packets were mailed immediately.

Doug King made the most phone contacts and one-half of his prospects mailed in their dues, becoming official NRCA members.

For his efforts, King received a handsome leather briefcase.

On October 4, Chairman Hutchison rolled up his sleeves and joined his crew in manning the phones and 115 prospects were contacted.

The October team included: George Gaines of Greenville Roofing, Greenville, S.C; Membership Chairman Gaylord Blue of Blue's Roofing, San Jose, Calif; Dick Zimmermann of Hoge Warren Zimmermann, Rolling Meadows, Ill; Harry Esbenshade, III, of Tri-State Roofing & S/M, Vienna, W.V. and John Stump of Lowndes Roofing & S/M, Valdosta, Ga.

On both days, prizes were awarded to the recruiters when they contacted a certain number of prospects.

For one recruit, a lucite desk clock was presented; with four prospects, a wine thermometer; for eight, a black cross pen and with 12 recruits, a crystal decanter.

November 16 is the next Phone Day. If you would like to help strengthen the membership ranks of NRCA and also be rewarded for your efforts with distinguished gifts, call Anna Leonhardt at NRCA, 312/693-0700.



2000 Club

Having personally recruited five new members to NRCA, the following contractors are now eligible for membership in the NRCA 2000 Club:

William T. Fort, Jr.
Fort Roofing & S/M Works
Sumter, S.C.

Doug King
Tip Top Roofers, Inc.
Atlanta, Ga.

Richard Marubio
Raincoat Systems, Inc.
Broadview, Ill.

For more information on becoming a member of the 2000 Club, contact Anna Leonhardt at the NRCA office.



New Members

The following have been approved for NRCA membership between September 9 and October 5, 1983

CONTRACTORS

- Bash/Pepper Roofing Co.
712 North Hickory
P.O. Box 795
Champaign, Ill. 61820
R.C. Pepper
- J.N. Bearmore & Co.
P.O. Box 786
36A Highway 35
Neptune, N.J. 07753
John G. Haulenbeck Jr.
- A. Braun & Sons, Inc.
5416 Carthage Ave.
Norwood, Ohio 45212
Gregory Braun
- Clayton Roofing & S/M Co.
265 S. Main St.
Jonesboro, Ga. 30236
Tony Waldrop
- Colorado Moisture Control,
Inc.
1281 S. Cleveland
Loveland, Colo. 80537
Mark Harrold
- Conte Roofing Co.
449 Market St.
Saddle Brook, N.J. 07662
John Conte
- Diversified Roofing &
Insulation Co.
1 West Interstate
Bedford, Ohio 44146
William M. Rogers, Sr.
- Independent Roofing Co., Inc.
550 Sixth Ave.
Menominee, Mich. 49858
Joseph I. Boyer
- McRae Roofing & Siding
Corp.
2147 N. Fayetteville
Asheboro, N.C. 27203
Samuel B. Allen
- Mid-Carolina Roofing & Maint.
Inc.
P.O. Box 512
715 Smithpond Rd.
Lexington, S.C. 29072
H.E. Livingston
- Roofing of Broward, Inc.,
5712 Funston St.
Hollywood, Fla. 33024
Pierre C. Duelz
- Roofing Enterprises of S.C.,
Inc.
P.O. Box 356
1214 S. Guignard
Sumter, S.C. 29150
Robert Nunnery

- Thames Roofing Co.
520 S. Church St.
Florence, S.C. 29501
Robert Thames

ASSOCIATES

- American Hydrotech
541 N. Fairbanks Ct. — Suite
2208
Chicago, Ill. 60611
Ed Jarger
- Bulk Aggregate Supply
166 Anderson St. Suite 115
Marietta, Ga. 30060
W.L. Stribling
- Midwest Sales
900 S. Second St.
St. Louis, Mo. 63100
Dean Wiley
- Power Marketing Group, Inc.
3410 S. Galena St.
Suite 240
Denver, Colo. 80231
J.P. Power
- Rohm & Haas Co.
Independence Mall West
Philadelphia, Pa. 19105
Teresa M. Gillis
- Roofers Mart of Georgia
1847 South Cobb Industrial
Blvd.
Smyrna, Ga. 30080
Fred Farley
- Wooley & Co.
6865 Mimms Dr.
Doraville, Ga. 30340
Herb Wooley

INTERNATIONAL

- Lemminkainen OY
Kutomontie 9
00380 Helsinki 38
Finland
Pauli Heikkila
- Rotocure Div. of
Atlas Rubber Co. Ltd.
P.O. Box 19590 Woolston
Christchurch New Zealand
J. Andrews
- Shell Francaise
29 Rue de Berri
75397 Paris Cedex 08
France
M. Simoncelli
- Urbanizaciones Y
Construcciones
Del Norte S.A.
El Paso, TX 79925
Carlos Contreras

NRCA Officers & Directors

Coming Events

December 1

Roofing Systems Conference
National Roofing Contractors
Association
Nashville, Tenn.

December 2-3

Annual Weekend Meeting
Chicago Roofing Contractors
Association
St. Charles, Ill.

December 5-7

New Leader Conference
National Roofing Contractors
Association
Chicago, Ill.

December 5-7

Committee D-8 Meeting
American Society for Testing
and Materials
Bal Harbour, Fla.

December 8

Reroofing & Energy
Conservation Conference
National Roofing Contractors
Association
Seattle, Wash.

December 13

NRCA Membership Phone Day
National Roofing Contractors
Association
Chicago, Ill.

December 13-15

Trade Show
Mid-Atlantic Roofing
Contractors Association
Baltimore, Md.

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

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JOHN BRADFORD
Billings, Mont.

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W. H. BRANSON, JR.
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R. L. BUBENZER
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LARRY CARLSON
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ROBERT CLAWSON
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STANLEY GERSON
Macon, Ga.

THEODORE HOPONICK
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GERALD LONGEROT
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SAFE & SOUND



Sound advice on roofing safety by the members of the National Roofing Contractors Association (NRCA).



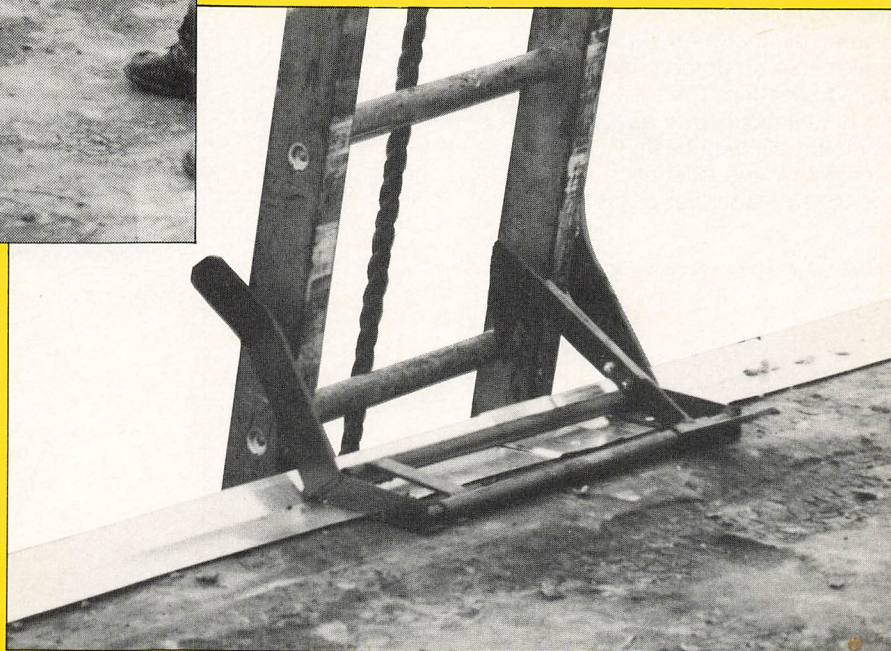
Secure Ladder

Delbert McHugh of Hans Rosenow Roofing Co. in Chicago, Ill., helped design a safety instrument which utilizes a ladder jack for hoisting.

First, the unit is fastened to the roof or wall (it is adjustable to fit various size ladders).

Then, a manually-operated hook secures the ladder rung when the ladder is positioned against the wall.

Small and large crews alike have found this unit an invaluable way to secure a ladder to a building, according to McHugh.



Catch shown in closed position locking ladder securely to the wall.

NRCA and the author(s) do not represent or warrant that these safety tips fully comply with the law, insurance company requirements or recommendations, or the legal duties owed by employers to their employees and to the public. The NRCA and the author(s) disclaim any responsibility for any injuries to persons or property, or for any violation of applicable laws or regulations which may result in use of, or reliance upon, the information and recommendations contained herein.



New Products, Ideas, & Publications

Three New Products from Conklin

Conklin Co., Inc., has introduced three new roofing products, Rapid Roof II®, Rapid Ply™ and Master Bond™.

Rapid Roof II® is a two-coat acrylic roof coating system that consists of a tan base coat and a reflective white top coat which provide a seamless, weatherproof, fire resistant and energy efficient covering.

Rapid Ply™ is a fluid applied, fabric reinforced roofing system. Three different fabrics with varying degrees of flexibility are available, depending on the type of function of the surface to be covered.

Master Bond™ is a single-layer, cold-applied sheet of white, high-grade Hypalon synthetic rubber, bonded to a reinforced fiber-backed sheeting. The system is fully bonded to any geometric building design — over new and existing roof construction, flat or pitched.

Check #114 on Reader Service Card

WeatherGard Introduces Splice Tape

A new lap splice tape is now being manufactured by WeatherGard Roofing Systems.

WeatherSeam is a self-adhering lap splice tape, used to join EPDM single-ply elastomeric roofing membranes.

The tape is applied to one surface of the splice and the paper backing is peeled off as the splice is made. The clean splice is rolled perpendicular to its length. No lap sealant bead is required.

WeatherSeam is cured and has a long stable shelf life.

Check #115 on Reader Service Card

Cellular Concrete Systems Available from CELLUFOAM™

CELLUFOAM™ cellular concrete systems and products are now available from CELLUFOAM Systems Company in Waukesha, Wis.

The product line has been acquired from Waukesha Foundry Div., ABEX Corp.

Cellular concrete is lightweight and fire-resistant. It can be used for roof and floor decks, concrete block insulation and concrete panels.

CELLUFOAM cellular concrete is produced by adding stable, pre-formed foam into a properly proportioned sand-cement mix which is agitated in a conventional mixer.

This mix can be up to 50 percent lighter than conventional concrete.

When used for roof decking and sloping for proper drainage, the cellular concrete is applied in a layer approximately one to two inches thick, depending on the insulation value desired. A conventional tar/felt/gravel membrane is then applied.

Check #116 on Reader Service Card

New Foam System Insulates Concrete Block Cavities

A new foam insulation system that effectively insulates concrete block and masonry cavity walls has been developed by the CPR Division of The Upjohn Co.

POLY-C is a polycarbonyl — a material that does not contain formaldehyde.

The new insulation is supplied in the form of two liquid components, which are processed at the construction site and poured into the cavity in concrete blocks or masonry walls.

After the mixture is injected into the block or masonry wall cavity, the carbon dioxide created by the reaction of the two components causes the mixture to expand and fill the wall cavity.

Check #117 on Reader Service Card

Parsec Roof System Uses Aluminum Film

Parsec, Inc. has a single-ply roof system that uses an aluminized film for a radiation barrier.

The Parsec Reflective Roof™ is fully adhered to the roof surface with a pressure sensitive adhesive.

According to the firm, the silver-colored material reflects 90 percent of the sun's radiation, resulting in reduced energy consumption.

The lightweight material will not oxidize or corrode and is not affected by ultraviolet or infrared rays.

The Parsec system was invented for use as a radiation barrier inside the roof.

Check #118 on Reader Service Card

Bond Cote Develops Single-Ply Membrane

Bond Grey™ 35 is Bond Cote Systems' latest entry into the single-ply market.

The new product is manufactured with a reinforcement of Celanese Fortrel polyester, utilizing the advanced fiber-loc weave technology.

Bond Cote Systems' thermoplastic polymeric alloy is applied, using a combination of special adhesive systems for superior chemical and mechanical adhesion.

Bond Grey™ 35 is U.L. and F.M. approved and backed by a 10-year warranty on materials and installation.

Check #119 on Reader Service Card

Neither Rain Nor Snow Affects ROOFDEX

ROOFDEX is a one-coat roofing system developed by Andek Chemical Corp., a subsidiary of 3E Flashband Roof Saver Corp.

The product comes ready to use — no mixing or heating is required.

According to Andek, seconds after applying ROOFDEX to any roofing surface, it can rain or snow and ROOFDEX will be unaffected.

The material cures to a tough, rubber-like finish with good elasticity.

ROOFDEX can be applied by brush, roller or airless spray to many different roofing materials.

Check #120 on Reader Service Card

Brochure Describes Lord Corp.

A six-page brochure from the Lord Corporation's Chemical Products Group describes the company's capabilities for custom manufacturing adhesives, coatings, chemical intermediates and polymer additives.

The Chemical Products Group markets CHEMLOK® rubber-to-metal, VERSILOK® acrylic structural, TYCEL® laminating adhesives, CHEMGLAZE® polyurethane and PHOTOGLAZE® UV/EB curing coatings and TUF-TANE® polymeric film.

Check #121 on Reader Service Card

Classified Ads

Place a classified ad in *Roofing Spec* for 50 cents per word. There is a minimum charge of \$20. Boxed or display advertisements are available in the classified section for \$40 per inch (one inch minimum). Ads using blind boxes available at no additional charge to NRCA members; non-members add \$10.00 to total order. Send ad copy and payment to: Advertising Manager, *Roofing Spec*, 8600 Bryn Mawr Ave., Chicago, Ill. 60631

PERSONNEL WANTED

Seeking a top General Manager for one of Florida's leading built-up and single-ply roofing contractors specializing in new and reroofing of large commercial, industrial and institutional buildings. Also seeking new and reroofing estimators. Send resume outlining qualifications to Personnel, P.O. Box 15300, Tampa, Florida 33684.

PRODUCTS WANTED

UK flat roofing distributors with 15 nationwide outlets are interested in any products which can be viably marketed through their depots. Asphaltic Limited, Kentish Town Road, London NW5 2UN Telephone London 485-5600

TANKER AVAILABLE

One 1978 Taurus, 28 ton, 7200-gallon transport tanker. LPG engine conversion, starter generator kit with remote control, recirculating valve, 250 gallon LP tank. All on a 1973 flatbed trailer. Used six times, asking \$18,000. Mac Arthur Roofing & Sheet Metal Co., 3046 Carrolton Rd., Saginaw, MI 48604, (517) 755-5348.

10 NEW NATIONALS — 8 TON HYD. TRUCK CRANES

All have 95 ft. boom, all have attachments by (GIUFFRE BROS.) All are available now, some gas, some diesel. Buy one or buy all 10. Price starting under \$50,000. Call Don at Giuffre Bros. Cranes, Inc. (414) 761-2300

SALES ASSOCIATES

Sales associates wanted for the highest quality commercial/industrial roofing product on the market. Must be effective calling on roofing contractors and large corporate accounts. Only people of the utmost integrity with the customer's best interest at heart need inquire. References required. Several western and southeastern states open. Call Otto Pacific, Inc. at 303-632-3810.

CRANE FOR SALE

Roofer Special Truck Crane, 1983 RO Stinger 11.5 Ton Cap. 88 ft. boom, Clam Bucket, Hopper, Pallet Fork, Humpty Dumper mounted on a IHC diesel truck with 16 ft. body. 8500 miles. Want to sell fast! Call Don at 414-761-2300

ROOF VACUUM HOSE FOR SALE

Flexible, lightweight hoses, for roof vacuum applications. Hoses are a proven success in the removal of pea gravel from the roof. Hose for vacuum machine to the roof is available in 4", 5" & 6" I.D. x 100 ft. lengths. Styles 180AR, 220RS & 110CL. Whip Hoses - 4" I.D. x 100 ft. lengths. Styles #180BL or 155Gray. Hose is in stock for immediate delivery. We ship anywhere. For more information and pricing call 414-272-2141. Milwaukee Rubber Products, Inc. 1117 N. Water St. P.O. Box 92896, Milwaukee, Wisconsin 53202

Firestone

REGIONAL SALES MANAGER

A college degree in Engineering, Marketing or Business is required as is 7 years of successful experience in commercial roofing sales and sales management. Position is responsible for selecting, training and managing salaried and commissioned sales reps in multi-state areas. Reply to: Teresa M. Granger, Personnel Department.

SENIOR SALES REPS

A BS in Engineering or Marketing and at least 5 years experience in the commercial roofing industry. Experience selling EPDM roof systems is a definite plus. Reply to: Teresa M. Granger, Personnel Department.

COMMISSIONED SALES REPS

We have openings in major cities throughout the country for qualified applicants with successful sales record in commercial roofing sales to roofing contractors and architects. Reply to: Hig Dillenger, Field Sales Manager, Roofing Products.

SENIOR APPLICATION ENGINEERS

A BS in Engineering and 5 years experience in roofing engineering, systems design, blueprints, roof system specifications, material approvals and providing technical assistance to roofing contractors. Reply to: Teresa M. Granger, Personnel Department.

FIELD TECHNICAL REPS

Applicants must have 3 years experience performing roofing contractor trainings, inspecting completed installations, providing hands-on assistance in solving field problems and providing data on field performance of products. Reply to: Teresa M. Granger, Personnel Department.

Firestone

1700 Firestone Blvd.
Noblesville, IN 46060

An Equal Opportunity Employer M/F

ROOFING MANAGERS

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

SALES REP NEEDED

Established roofing and insulation company needs sales representative for Manhattan, Bronx and Westchester areas. Salary, commission plus benefits. Call Mr. Schindel or Mr. Fioccola at 212/792-9100. Or write to Triboro Insulation and Roofing Company, Inc. at 2532 Boston Rd., Bronx, N.Y. 10467.

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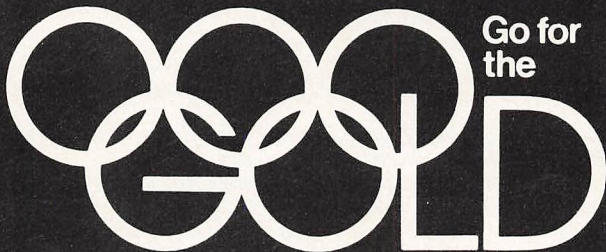
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Tech Talk

continued from page 42

Material	Resistance
Outside Surface	0.17
BUR	0.33
one-inch perlite insulation	2.78
vapor retarder	nil
steel deck	nil
air space (heat flow up) 3.5 + "	0.93
5/8" mineral suspended ceiling tile	1.56
inside surface	0.61
	<u>R (total) = 6.38</u>

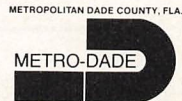
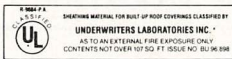
$$U = \frac{1}{R \text{ (total)}} = \frac{1}{6.38} = 0.16$$

The "U" values for roof assemblies, ceilings and walls using most materials in construction are listed in Table 3A (Thermal Properties of Typical Building and Insulating Materials - Design Values), Chapter 23 in the ASHRAE Handbook of Fundamentals published by the American Society of Heating, Refrigerating and Air-Conditioning Engineers.



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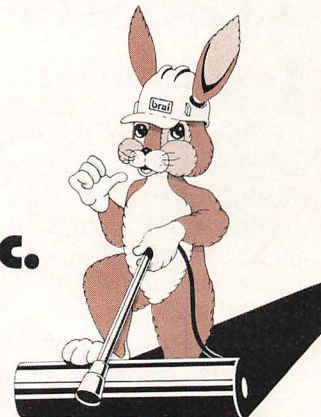
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Tech Talk

By Bob LaCrosse, CAE
Director of Technical Services

Heat Loss & Heat Transfer

In the July TECH TALK article, I listed the different types of roof insulation. In this month's report, I will simplify many of the terms used regarding insulation heat loss or heat transfer in roof assemblies. The following materials will be particularly helpful to newcomers to the roofing field in determining compliance with energy conservation requirements. For a more detailed report, refer to the NRCA Energy Manual (revised February 1982).

Btu — British Thermal Unit; the amount of heat needed to raise the temperature of one pound of water 1°F. The Btu is used to measure the amount of heat just as the minute or hour is used to measure time. There are approximately 13,000 Btu's in one pound of coal; 141,000 Btu's in one gallon of oil and 1,000 Btu's in one cubic foot of natural gas.

“Conductivities or conductances of individual materials are not directly applicable to heat loss calculations; instead, they must be converted into a resistance.”

k — Thermal Conductivity; the amount of heat (Btu's) transferred in one hour through one square foot of homogeneous material one-inch thick for a difference in temperature of 1°F. For example, the average “k” for fiberboard roof insulation is 0.38. This means that for a one-inch thickness, there is a heat transfer of 0.38 Btu per hour per square foot for each degree difference in temperature between its two surfaces.

C — Represents the conductance of a material and is used to show the amount of heat (Btu's) that will pass per hour through one square foot of homogeneous, non-homogeneous or a combination of materials for the thickness or type under consideration for a difference in temperature of 1°F between the two surfaces. For example, the average “C” value for ½” nominal thickness of

plywood decking is 1.60.

R — Represents resistance, which is the reciprocal of conductivity or conductance, thus,

$$R = \frac{1}{k} \text{ or } \frac{1}{C}$$

U — Designates the total or overall transmission of heat (Btu's) in one hour per square foot of area for a difference in temperature of 1°F between the air on one side to air on the other side of a structure.

The four measurements “k”, “C”, “R” and “U” should be understood by anyone discussing insulation in a roof system or other components in a building. When we talk about a complete roof assembly or wall, we refer to its “U” value. It should be understood that the lower the value of “k”, “C” and “U”, the more resistance to heat transfer is indicated. The larger the value, the more the resistance is indicated with “R” being the measure of resistance and the reciprocal of “k” or “C”.

“The Btu is used to measure the amount of heat just as the minute or hour is used to measure time.”

In order to determine the “U” value of a roof assembly or other components of a building, one must know the thermal conductivity (k) or conductance (C) of all the elements making up the complete assembly or section. These values may be determined in the laboratory in accordance with ASTM C117, Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Guarded Hot Plate or ASTM C518, Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter (providing it shows comparability to absolute values in accordance with ASTM (C177). ASTM D518 is a secondary or comparative method of measuring the thermal transmission properties of specimens, since only the ratio of the thermal resistance of the specimen to that of a standard specimen is measured absolutely. The thermal resistance of the standard specimen must be determined separately in accordance with ASTM C177. These two test methods are now included in the ASTM Book of Standards, Volume 04.06 (formerly Part 18). Conductivities or conductances of individual materials are not directly applicable to heat loss calculations. Instead, they must be converted into a resistance $R = \frac{1}{k}$ or $\frac{1}{C}$. After the

resistances of all the elements or materials making up the assembly (including resistance for surface and air spaces) are known, the “U” value may be calculated by:

$$“U” = \frac{1}{R_1 + R_2 + R_3 \dots + R_D}$$

For example, the “U” value of a roof assembly with BUR, one-inch thick perlite insulation, vapor retarder, steel deck, dead air space and ⅝” mineral fiber suspended ceiling would be:

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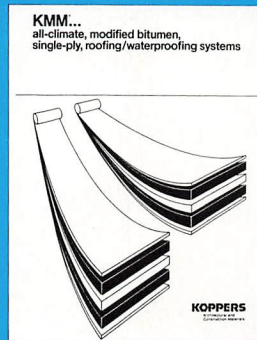
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