March | April 2019

Vol. 10 | Issue 2

Roofing

THE INDUSTRY'S VOICE

Green Roofs Thrive in D.C.

+ More Vegetative Roof Projects

→ **THE HUTCHINSON FILES**
Designing Thermally Efficient Roof Systems

→ **BUSINESS SENSE**
Workplace Policies and Legalized Marijuana Use

→ **TECH POINT**
The ABCs of Environmental Product Declarations

NO MYTHS — ONLY FACTS

UV FACT:

UV testing* proves that STINGER collated caps lasted nearly **10X LONGER** than hand drive plastic caps! Hand drive caps can become brittle and crack, and could potentially leak within two months of UV exposure. STINGER collated caps can be exposed to UV rays for OVER A YEAR with no breakdown!

HIGH WIND FACT:

Our pneumatic Cap Nails have been independently tested** to withstand winds of 150 MPH for 60 minutes with no cap and nail separation. We even tested BEYOND Category 5 winds at 180 MPH with no failures!

New Model!

STINGER CN100B CAP NAILER

STINGER 1" NAILPAC®

"We started using STINGER a couple years ago, and it has made a big difference in job time, efficiency, and many more things."

"Got to use this monster today. I have to give it to you guys, it's amazing. High winds in the forecast over night I can sleep good knowing it's capped."

WARNING: **Side effects of STINGER tools and fasteners include; increased productivity, increased profits, time savings and no warranties voided.**

See it in action:

STINGERWORLD.COM/MEDIA/VIDEOS

*ASTM D7867-17 (UV Testing) performed by Intertek Group, PLC.

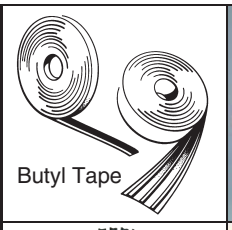
**ASTM D3161 (Wind Simulator) performed by Haag Research and Testing, LLC.

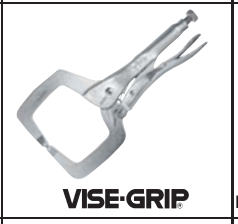
Always consult with your local building department for laws, codes and regulations prior to installing underlayment and housewrap.

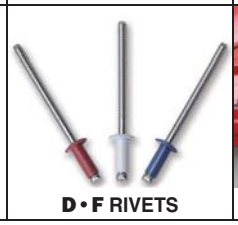
stingersystems

DYNAMIC FASTENER

Everything for the Metal Builder & Roofer®







FREE 132 Page Full Color Tool & Fastener Hand Guide provides prices, engineering data & details product offering.

DYNAMIC FASTENER is specifically geared to handle the needs of the Metal Building Contractor. We provide in-house custom color painting of screws and rivets with just a one or two day (days, *NOT* weeks) lead time. **FIFTY-FIVE MILLION** pre-painted rivets & **TENS OF THOUSANDS** of power tools are stocked and sold at the lowest prices. Highest quality, top name brand fasteners are stocked and sold at the lowest prices. Same day shipment on orders received by 4:00 p.m. CST. We are a supplier to the largest metal building manufacturers.

We want to be ***YOUR*** source for screws, pre-painted rivets, anchors, flashings, **DYNA-GUARD®** snow retention system, safety equipment, hand tools, power tools and accessories.

7 warehouses to serve your construction needs for tools and fasteners

(MAIN OFFICE)
Kansas City • Chicago • Houston • Las Vegas • Memphis • St. Louis • St. Paul

CALL 800-821-5448 or Order Online @ DYNAMICFASTENER.COM

Call for your Free Full Color 132 Pg. Hand Guide. Better yet, call us for your next tool or fastener requirement. Discover for yourself why your peers enjoy doing business with our company!


GSSI
SEALANTS
PREMIER BUTYL SEALANT TAPES
A LASTING DEFENSE
FOR OVER 30 YEARS, MANUFACTURERS AROUND THE WORLD HAVE ENTRUSTED THEIR BUILDINGS' MOISTURE DEFENSE TO THE MOST RELIABLE BUTYL SEALANT ON THE MARKET, MB10A BUTYL TAPE.
30
800.288.9489
GSSISEALANTS.COM

Flex™

Protecting our customer's assets for over a quarter of a century

Thermoplastic Single Ply & Multi-Ply Roofing Systems

Flex has been committed to manufacturing the highest quality Elvaloy® KEE, PVC and TPO roofing products for the Commercial and Residential Roofing Markets. With over 28 years and more than 250 million square feet installed throughout the country, we have the knowledge and experience needed to meet all of your roofing system requirements.

- Flex Elvaloy® KEE
- Flex PVC
- Flex TPO
- Waterproofing Systems
- Green Roof Solutions
- Flex Deck Systems


COMMERCIAL


INDUSTRIAL


INSTITUTIONAL


HOSPITALITY

ROOFING SYSTEMS THAT STAND THE TEST OF TIME

Flex partners with roofing consultants and contractors to design and install systems that preserve energy, save the environment and last for decades.

Factory Mutual System · CRRC · UL · ULC · Miami-Dade · ENERGY STAR · National Roofing Contractors Association

Flex™
Leader in Thermoplastic Roof Systems

610-916-9500
FlexRoofingSystems.com

See us at:
IRE, Nashville, TN, Feb. 11-13, Booth #2401
RCI, Orlando, FL, March 16-17, Booth #411

UNSURPASSED ONSITE ROLL FORMING COMES TO YOU

Advanced design means more time forming panels, not adjusting the machine.
Backed by a company in business since 1936, dedicated to quality and service.

Discover for yourself why Zimmerman is the best.

Zimmerman Metals Inc

1-800-247-4202 | zimmerman-metals.com

contents

MARCH / APRIL 2019 | VOL. 10 NO. 2

FEATURES

Roofing
RoofingMagazine.com

VOL. 10, NO. 2 Is published bimonthly by HRT Publishing LLC, 4711 Hope Valley Road, Box 202, Durham, NC 27707. Telephone (919) 593-5318. POSTMASTER: Send address changes to *Roofing*, 4711 Hope Valley Road, Box 202, Durham, NC 27707. *Roofing* is published six times per year: January/February, March/April, May/June, July/August, September/October and November/December. The magazine is written for the building professional concerned with the design, specification and application of roofing. Issues with bonus distribution at national, regional, state and local roofing and construction conventions and trade shows occur regularly throughout the year.

contents

MARCH / APRIL 2019 | VOL. 10 NO. 2

COLUMNS

THIS ISSUE IS INTERACTIVE

Download the free Layar Augmented Reality app. (The QR code will help you find the app.) Then, hover over page 42 with a smartphone or tablet and watch a video that brings the content to life.

layar
INTERACTIVE PRINT

Download the free Layar App

Scan this page

Discover interactive content

DEPARTMENTS

ON THE COVER

The Wharf is a riverfront community spanning nearly a mile of the Potomac River in Washington, D.C. The neighborhood features high-end hotels, luxury condominiums, retail shops, commercial offices and music hall. Vegetative roofs help tie together the diverse buildings in the area.

Photo: The District Wharf

IT'S NOT AN ELEPHANT, **IT'S A MAMMOTH.**

SOPREMA
www.soprema.us | 800.356.3521

What is the elephant in **your** room? Mold hidden in the walls? Water leaking from the ceiling? Water infiltrating the foundation? SOPREMA delivers the power of the mammoth, providing full building envelope solutions to keep those elephants out of any building—schools, hospitals, manufacturing and beyond.

SOPREMA DELIVERS THE POWER OF THE MAMMOTH, A FULL BUILDING ENVELOPE OF PROTECTION UNMATCHED IN THE INDUSTRY.
PUT THE MAMMOTH TO WORK FOR YOU.

INTRODUCING
DUOTACK® SPF ADHESIVE

SPF ADHESIVE FORMULATED BY SOPREMA FOR FASTER INSTALLATION WITH MORE COVERAGE

For more information on how to save time on the construction site, visit http://info.soprema.us/duotackspf

RAISE THE ROOF

WRITTEN BY **CHRIS KING**

A Patch of Earth

There was an old TV commercial for one of the Big Box stores that really hit me. It was an ad selling garden tools and mulch, and at the end of the commercial, the tagline was something like this: "It's not just your yard. It's your own little piece of the planet."

That's how I remember it, anyway. And that's weird for several reasons, including the fact that I almost never watch commercials (that's what the remote control is for), and I'm certainly not a huge fan of yard work. I am, however, ridiculously attached to the small scrap of grass behind our house that is our backyard.

When the weather cooperates, our yard makes our house seem ten times bigger. The backyard provides more usable space, a place to relax and a little touch of Mother Nature. It's a literal breath of fresh air.

I was reminded of how much I miss our backyard during the winter while working on this issue, which spotlights green roofs. I can understand the desire to increase usable space, but vegetative systems can bring so much more to the rooftop than aesthetics. They can help minimize storm water runoff, expand the natural habitat for birds and other wildlife, and help roofs perform more efficiently over a longer lifespan. From The Wharf in D.C. to a Manhattan skyscraper to a home on an island in the state of Washington, the green roofs profiled in this issue are getting attention for all the right reasons.

When it comes to providing a haven for the birds and the bees, green roofs are the stars of the show, but every roof has the potential to last longer, conserve energy and help the planet. The industry is taking a leading role in educating the public and government on the benefits of long-lasting, high-performing roofs. In this issue, Tom Hutchinson, Louisa Hart and Marcin Pazera explore the importance of thermally efficient products and systems — and documenting their performance.

The roof is the most crucial part of the building envelope, and roof performance is a crucial component of a building's energy footprint. In this industry, durability and sustainability have become the watchwords. And that's important because when you pull up Google Earth on your computer, what do you see? Roofs.

It's not just your roof. It's your own little piece of the planet. R

Find us on

Roofing

MARCH . APRIL 2019
VOL. 10 NO. 2

Roofing welcomes letters to the editor. Letters must be signed and include a return address/email and telephone number. *Roofing* reserves the right to edit letters for clarity and length. Send letters to Chris@RoofingMagazine.com.

If you enjoyed reading this issue, please consider submitting something for the next one. Let's talk about ideas! Call Chris King at (248) 376-5115; email him at chris@roofingmagazine.com; post a comment on our website; and/or Facebook and tweet us. This magazine—and your peers—are counting on you!

Ridley Township Marina, Ridley, PA Installing contractor: E.P. Donnelly Inc. Architect: Catania Engineering Associates,
General contractor: J.S. McManus Inc. Photographer: hortonphotoinc.com
Profiles: Snap-Clad, PAC-750 vented, ColorGard snow retention system Color: Copper Penny

BE BOLD

SNAP-CLAD
METAL ROOF PANEL
Copper Penny

The town's business manager opted for Petersen's bold Copper Penny metallic finish metal roof. "It's like a flame; I'm glad they chose it. It sparkles like a diamond."

-Clarice Jones, Project Architect, Catania Engineering Associates

NEW PHOENIX PLANT
WEST COAST DELIVERY

Case study at PAC-CLAD.COM/RIDLEY

PAC-CLAD.COM | INFO@PAC-CLAD.COM

IL: 800 PAC CLAD MD: 800 344 1400 TX: 800 441 8661
GA: 800 272 4482 MN: 877 571 2025 AZ: 833 750 1935

See us at RCI – booth 735

PAC-CLAD PETERSEN
A CARLISLE COMPANY

CONTRIBUTORS

Felicia M. Haigh is an attorney with Raleigh, N.C.-based Anderson Jones PLLC. In "Business Sense," page 36, she surveys the shifting legal landscape in the era of legalized marijuana use and urges business owners to review company policies in light of recent changes.

David Kronenfeld is an attorney at Cotney Construction Law, a firm that serves as General Counsel for FRSA, RT3, NWIR, TARC, TRI, WSRCA and several other roofing industry associations. In "Succession Planning," page 38, Kronenfeld defines some of the key components of business succession planning.

Marcin Pazera, Ph.D., is the technical director for Polyisocyanurate Insulation Manufacturers Association (PIMA). He serves as the organization's primary technical liaison to organizations involved in the development of building standards. In "Tech Point," page 44, he examines the development of Environmental Product Declarations (EPDs) and their role in the building industry.

Louisa Hart is the director of communications for the Washington-based EPDM Roofing Association (ERA). In "Details," page 48, she explores the topic of energy loss in the roof system, tapping into the insights of André Desjarlais, Program Manager of the Building Envelopes Research Program at Oak Ridge National Laboratory.

Thomas W. Hutchinson, AIA, FRCI, RRC, CRP, CSI, is a principal of Hutchinson Design Group Ltd. in Barrington, Illinois, and a member of *Roofing*'s editorial advisory board. In "The Hutchinson Files," page 54, he delineates the best practices for designing thermally efficient roof systems.

John A. D'Annunzio is the owner of Paragon Roofing Technology in Troy, Michigan. He has been involved in testing, evaluating, and designing roofing and waterproofing materials and systems for more than 30 years. In "Special Report," page 70, he examines advances in liquid-applied membranes and details why they are well suited for roof restoration projects.

QUALITY ROOFING INSTRUMENTS FOR ROCKSTAR PERFORMANCE

Be a Rockstar when you install Premium quality, highly reflective membranes from Polyglass. Polyfresko G cap sheets feature patented CURE Technology® for improved granule retention, and sustained reflectivity. Learn more at polyglass.us or contact 800.222.9782.

CURE technology®

BOOTH 123

NERCA NORTH/EAST ROOFING CONTRACTORS ASSOCIATION

BOOTH 207

ROOFING AND WATERPROOFING SYSTEMS
POLYGLASS
MAPEI GROUP

Minnesota State University, Mankato Wins Roofing Alliance's Student Competition

THE ROOFING ALLIANCE, the foundation of the National Roofing Contractors Association (NRCA), announced the winners of the 2018-2019 Construction Management Student Competition at the NRCA's Industry Awards Ceremony and Cocktail Reception held in Nashville, Tennessee.

In its fifth year, the Roofing Alliance Construction Management Student Competition welcomed five finalist teams to the 2019 International Roofing Expo to give oral presentations as the final segment in the competition. This year, the teams were tasked with submitting a qualified bid package for installing a new roof system for the Hilton Franklin Cool Springs Hotel in Franklin, Tennessee, a project recently completed by Rackley Roofing Co., Carthage, Tennessee.

Judges reviewed the written proposals and selected five teams as finalists for the competition. At the IRE, six roofing industry experts judged the oral presentations and the Roofing Alliance announced Minnesota State University, Mankato as the winning school. Tony Centro of University of Florida was named the Best Individual Presenter.

IKO Launches ROOFPRO Loyalty Program

IKO INTRODUCED its new ROOFPRO loyalty program designed to help contractors increase their business and boost their bottom line. Resources include agency-managed advertising and vendor programs, the ROOFPRO GO! app, and a robust Salesforce customer relationship management (CRM) program customized for roofing contractors. "ROOFPRO contractors will not only benefit from comprehensive business support tools designed for their businesses — a game changer for their bottom line — but they'll also benefit from educational resources, expert community programming, extended warranties and much, much more," said Jeff Williams, brand director, North America, IKO.
For more information, visit www.ikoroofpro.com.

DIY Network Web Series Features Atlas Shingles With Scotchgard Protector By 3M

Mike Holmes Jr. and **Sherry Holmes** grew up watching their celebrity dad, Mike Holmes, "Make It Right." Now it's their turn as they host an exclusive five-part web series, "Roof It Right," in which they team up with Atlas Pro contractors to replace ugly, streaky roofs for lucky homeowners.

"We're thrilled to partner with the Holmes group on this special project," said Stan Bastek, director of marketing and sales development for Atlas Roofing Corporation. "And, we're proud to manufacture shingles with Scotchgard Protector by 3M, which are a HOLMES Approved Product. It's a win-win relationship for everyone involved."

In the series, Mike Jr. joined George Boudreaux, owner of Pelican Roofing in Lafayette, Louisiana, at the home of Carl and Ann Leblanc. Sherry Holmes met up with Kyle Grasso, president of A-Team Roofing in Collierville, Tennessee, to help homeowners Mark and Donna Collinsworth. Both Roof It Right crews installed an Atlas Signature Select Roofing System, including Atlas Pinnacle Pristine shingles with Scotchgard Protector by 3M. The series airs on the Mike Holmes YouTube channel.

duraSTRONG®

RUBBER PAVING TILES

Turning EMPTY SPACES into **PEOPLE PLACES.**

Keep your properties looking their best with duraSTRONG® exterior rubber paving tiles. Slip-resistant and able to withstand the toughest weather conditions, duraSTRONG is perfect for any outdoor application. Our interlocking design and proprietary manufacturing process are the result of extensive testing and engineering backed by our best-in-industry Limited Lifetime Warranty.

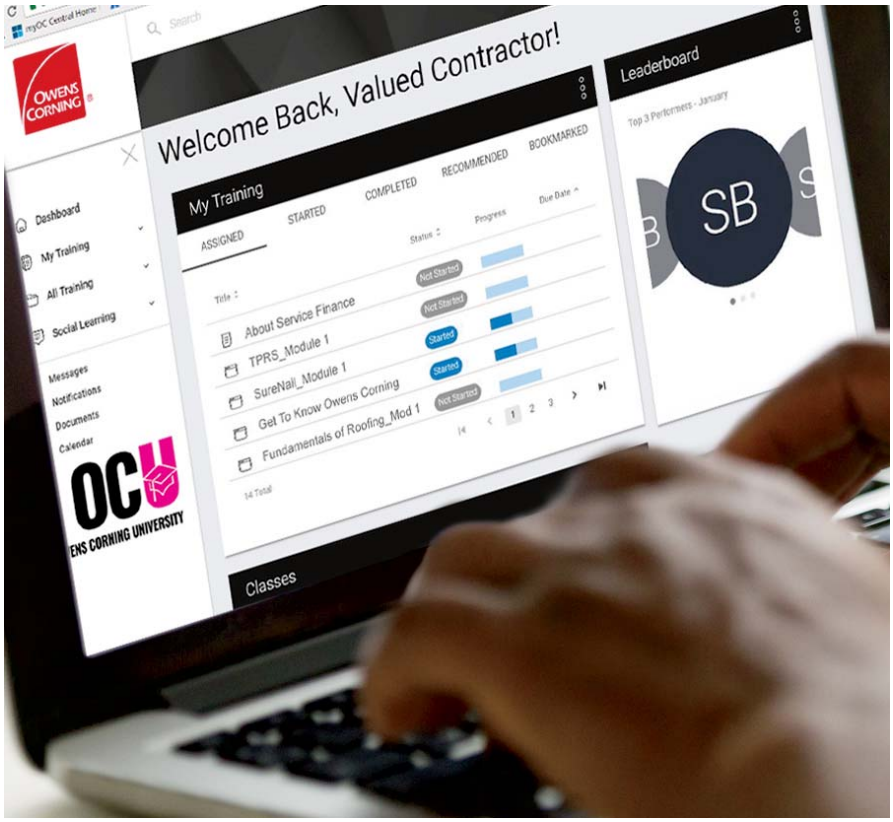
PATENTED TILE KROS LOCK® LOCKING SYSTEM

MATERIALS · WORKMANSHIP LIMITED WARRANTY LIFETIME IMPACT ATTENUATION

U.S. GREEN BUILDING COUNCIL MEMBER

sofSURFACES RUBBER TILE SOLUTIONS

sofSURFACES.com
1.800.263.2363



Owens Corning University Expands Contractor Educational Opportunities

OWENS CORNING Roofing is expanding its Owens Corning University educational platform with the introduction of Owens Corning University (OCU). Free to all Owens Corning Roofing Contractor Network (OCCN) members on the OCConnect Resource Center, OCU is the platform in which all live and online educational opportunities will be offered. OCU's comprehensive platform will provide members leading edge, 24/7 "on demand" education and resources designed to help contractors build their business.

A gaming element integrated into OCU recognizes the competitive spirit of contractors. Leaderboards on the Learning Management Platform track education points, award badges for completed educational tasks, and allow contractors to see how they rank compared to their competition.

Offering an unlimited number of users, OCU provides critical content to help contractors throughout their organization – from employee onboarding to installation best practices. OCU is the latest introduction to a portfolio of digital resources Owens Corning offers OCCN members. "Owens Corning developed OCU to put relevant education directly in the contractor's hands, regardless of time or location," said Jon Gardner, Owens Corning's Roofing Contractor Training and Education Leader. "Because each module is 15 minutes or less, users can easily fit learning into their schedule."

For more information, visit www.owenscorning.com.

Tile Roofing Institute Announces New Name and Brand Identity

The Tile Roofing Institute (TRI) announced a name change to the Tile Roofing Industry Alliance (TRI Alliance) as it expands its activities in the representation, education, training and legislative roles within the tile roofing industry in the U.S. and Canada. The new name represents a broader scope of shared knowledge, comradery and advocacy as an association.

For more than 30 years, TRI Alliance has been the primary voice for concrete and clay tile roofing, serving not only as a resource and advocate, but also as a true partner, working closely with members, builders, contractors and legislators as allies to create change. Rick Olson, president of the TRI Alliance stated, "Through our research we have discovered a need to bring further awareness to tile roofing and our organization. Our new name and logo underscores our objectives of taking a more assertive role within the industry to ensure that building codes and installation techniques continue to advance and to work collectively in alliance with our industry partners to promote the benefits of tile roofing in an ever-evolving roofing market."

Along with the new name, new logo and seal, TRI Alliance will be launching a new website. The new site will offer in-depth information of value to architects, designers, homeowners, contractors and builders, detailing expanded design options, sustainability and performance properties of tile roofing. For more information, visit www.tileroofing.org.

Experience. Innovation.

Keep operating costs from going through the roof

Our thermally broken roof hatch lowers building operating costs by minimizing heat transfer between interior and exterior metal surfaces, thereby resisting harmful condensation and providing superior energy efficiency under any conditions.

Roof Hatch Features:

- Patented thermally broken design
- R-20+ insulation
- Aluminum construction
- Engineered cover gasket system
- Lab tested & certified for thermal performance

Bilco®

an AmesburyTruth company

800.366.6530
WWW.BILCO.COM

NEWSFROMNRCA

The Rosemont, Ill.-based National Roofing Contractors Association represents all segments of the roofing industry, including contractors; manufacturers; distributors; architects; consultants; engineers; building owners; and city, state and government agencies. NRCA's mission is to infoårm and assist the roofing industry, act as its principal advocate and help members in serving their customers. For information about NRCA and its services and offerings, visit www.NRCA.net.

Helene Hardy Pierce Receives the J.A. Piper Award

THE NRCA ANNOUNCED Helene Hardy Pierce, vice president of technical services, codes and industry relations at GAF, is the 72nd recipient of its annual J.A. Piper Award. The award was presented at NRCA's 132nd Annual Convention in Nashville, Tennessee. The J.A. Piper award is the industry's most prestigious honor, recognizing roofing professionals who have devoted constant outstanding service to NRCA and the roofing industry.

Hardy Pierce, the first woman to earn the honor, serves on NRCA's board of directors and is a member of NRCA's Residential Contractor Committee, Roofing Day Task Force and Technical Operations Committee. She also has served as a Roofing Alliance student competition judge from 2015-19.

Hardy Pierce has been in the roofing industry for 38 years and has served on the board of directors for the Coalition for Procurement Reform; Roof Coatings Manufacturers Association, where she also served as president; Roof Consultants Institute Foundation; and Polyisocyanurate Insulation Manufacturers Association, where she also served as president. She has been involved with numerous other roofing industry organizations, including the Asphalt Roofing Manufacturers Association, ASTM International and SPRI.

"Those of you who know me know I believe we have a very kind industry with people who show up every day and solve problems, and it has only been a joy to be a part of it," Hardy Pierce said when accepting the award. "Thank you very much, and I am beyond honored to receive this award from contractors who I respect so much."

First presented in 1948, the J.A. Piper Award is named for former NRCA President Joseph A. Piper, whose extraordinary efforts kept the association alive during the Great Depression.

Showalter Roofing Service Honored With CNA/NRCA Community Involvement Award

Showalter Roofing Service Inc., headquartered in Naperville, Illinois, has been presented with the seventh annual CNA/NRCA Community Involvement Award sponsored by the NRCA and CNA. The award honors charitable works performed by NRCA contractor members.

Showalter Roofing Service created A Roof Over Your Head, a 501(c)(3) organization that helps homeowners in need of household repairs. CNA awarded Showalter Roofing Service with $7,500 to be presented to A Roof Over Your Head. In addition, NRCA dedicated the proceeds of its Cyber Monday sale in November 2018 to the winning charity.

Other companies recognized include Legacy Restoration, Plymouth, Minnesota; Core Contractors Roofing Systems, Denver, Colorado; and Beldon Roofing Co., San Antonio, Texas.

CHEM LINK
POLYMER INNOVATION

SEALANTS & ADHESIVES THAT DELIVER HIGH PERFORMANCE WITHOUT THE RISKS

CHEM LINK offers a family of high performance polyether sealants and adhesives for practically every application throughout the building envelope whether for schools, hospitals, offices or homes. CHEM LINK sealants are solvent-free and contain virtually no VOCs, eliminating risks to contractors and building occupants, contributing toward healthy indoor air quality and easing worries for building owners. Not only are CHEM LINK'S sealants non-toxic, but they deliver the highest levels of performance in strength, adhesion and flexibility.

For more information contact us at 1.800.826.1681 or visit www.chemlink.com.

NRCA Announces 2019-20 Officers and Directors

THE NRCA announced its 2019-20 slate of officers and directors. Nick Sabino, president of Deer Park Roofing Inc., Cincinnati, Ohio, has been elected NRCA chairman of the board, and Rod Petrick, president of Ridgeworth Roofing Co. Inc., Frankfort, Illinois, was elected chairman of the board-elect. Kyle Thomas, owner/vice president of Thomas Roofing Co. Inc., Mobile, Alabama; Tupac de la Cruz, founder of Roofing Solutions LLC, Prairieville, Louisiana; Doug Duncan, president of Nations Roof, Villa Park, Illinois; and Brad Sutter, executive vice president of Sutter Roofing Co. of Florida, Sarasota, Florida, were elected vice chairmen.


Nick Sabino


Rod Petrick

Additionally, the following were elected as new NRCA directors:

- Bill Baley, president and CEO of C.I. Services Inc., Mission Viejo, California
- Greg Bloom, vice president of national and strategic accounts at Beacon Roofing Supply Inc., Herndon, Virginia
- Collin DeBuysere, project manager at Roofing Technology Inc., Davenport, Iowa
- Scott Donnelly, president of Cooper Roofing & Solar LLC, Las Vegas, Nevada
- Don Fry, president of Fry Roofing Inc., San Antonio, Texas
- Dave Hesse, vice president of Kalkreuth Roofing and Sheet Metal Inc., Frederick, Maryland
- Scott Kawulok, vice president of B & M Roofing of Colorado Inc., Frederick, Colorado
- Kyle King, president of James King Roofing LLC, Lynnwood, Washington
- Rob Kornahrens, CEO of Advanced Roofing Inc., Fort Lauderdale, Florida
- Richard Lawson, senior vice president of The Lawson Roofing Co. Inc., San Francisco, California
- Matt Leonard, vice president of Architectural Sheet Metal Inc., Orlando, Florida
- J.J. Smithey, president of Frost Roofing Inc., Wapakoneta, Ohio
- Lisa Sprick, president of Sprick Roofing Co. Inc., Corvallis, Oregon

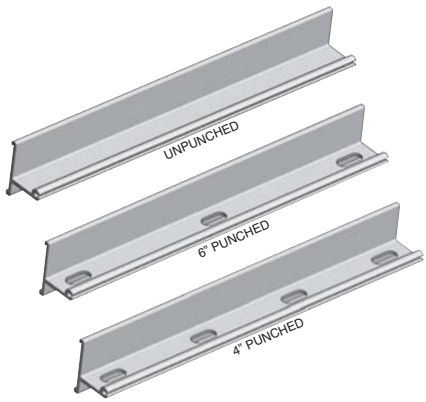
All 2019-20 officers and directors will assume their roles June 1, 2019.

DYNA-GUARD®

DYNA-GUARD® Snow Retention System installed on a metal roof.

IT IS TIME FOR A
CHANGING OF THE *GUARD*

DYNA-GUARD® is a snow retention system designed to be installed on metal roofs. We are discontinuing the line of S-5!®/ColorGard® and related products. Please call for our close-out prices on S-5!®



DYNA-GUARD is an 8' long extruded aluminum stick with a T-shaped profile stocked in: unpunched, 4" and 6" center punched. . . ***AN EXCLUSIVE* DYNA-GUARD *ADVANTAGE!***

DYNA-CLAMPS® are non-ferrous non-piercing clamps for attachments to standing seam metal roofs.

1) DYNA-CLAMPS have undergone extensive testing by the esteemed Encon Technology, Tulsa, OK.
2) All DYNA-GUARD, DYNA-CLAMP and SNO-DAM items are extruded from aircraft quality, high tensile aluminum "6005A T61 Aluminum".
3) All of these components are proudly manufactured in the U.S.A.
4) Over the last 15 years, our factory has produced over 5 ***million*** pounds of aluminum snow retention components for metal roofs.

Therefore, when you buy from us, you know that you are purchasing the highest quality parts manufactured by a proven veteran at supplying high quality snow retention components to our metal roof industry. Since we have a mutually exclusive relationship with our factory, you must purchase DYNA-GUARD and DYNA-CLAMPS to know that you're receiving the *true* time-tested results/benefits of dealing with our high quality factory.

SNO-DAMS® inhibit the ability of snow and ice to slide under the installed DYNA-GUARD

We are factory-direct on all of these components. Therefore, our valuable contractor customers benefit by paying substantially lower prices. Our valuable O.E.M. customers benefit by eliminating minimum order quantities and by eliminating any lead-time – which can stretch out to unacceptable lengths of 4 or even up to 6 weeks with some of our competitors. O.E.M.'s; our huge inventory levels will translate into less of your cash tied up in your inventory and typically completely eliminate the frustration of dealing with needed items that are on backorder.

DYNAMIC FASTENER • 800-821-5448

Owens Corning Roofing Introduces ProSell App

Owens Corning Roofing introduces ProSell, a digital app that streamlines and expedites the residential roofing sales process from sales pitch to order processing. ProSell was developed using Leap, a digital platform that simplifies and automates the home services sales process including estimating, financing, contracting and real-time communication. ProSell includes a digital pitch book along with comprehensive product data to support efficient and accurate estimating. The app is available to all Owens Corning Roofing Contractor Network (OCCN) members on the iOS App Store. For more information, visit www.owenscorning.com.

Mule-Hide Products Co. Introduces New Fluid-Applied Roofing Systems Brochure

From product charts to application tips, the new Fluid-Applied Roofing Systems brochure from Mule-Hide Products Co. guides contractors and building owners in selecting roof coatings to extend the service life and enhance the performance of an existing roofing system. The brochure includes overviews of three key roof coating types (silicone, acrylic and SEBS) and the types of applications they are best-suited for, as well as side-by-side comparisons of coating system types by substrate. For more information, visit www.mulehide.com.

ROYAL
ADHESIVES & SEALANTS

Innovative Designer and Manufacturer of Adhesives, Sealants and Tapes for the Commercial Roofing Industry

Application Eqiupment

Lockin' Pocket®

Millennium Adhesives

EternaBond®

EPDM Restoration

Innovation: Advanced adhesives, sealing systems and tapes

Speed: Patented adhesive applicators* for fast installation

Green: Essentially VOC free adhesives from rapidly renewable materials

Safety: Unique products that improve jobsite safety

* US 9,573,150 B2; US 9,566,594 B2; US 9,174,234 B2; CA 2,806,690 C; US 9,498,792 B2; US 9,381,536 B2; US 7,056,556 B2; US D501,855 S; CA 2,493,739 C

Tel: 1-800-248-4010
www.royaladhesives.com

Royal Adhesives and Sealants is a Proud Sponsor & Supporter of the Commercial Roofing Industry

MIAMI-DADE COUNTY APPROVED 14-0102-01 · CLASSIFIED UL US · FM APPROVED · SPRI SINGLE PLY ROOFING INDUSTRY MEMBER · NATIONAL ROOFING CONTRACTORS ASSOCIATION MEMBER · SPRA Associate Member · CANADIAN ROOFING CONTRACTORS ASSOCIATION crca

EVENTS

MARCH

14-19

RCI, INC. INTERNATIONAL CONVENTION AND TRADE SHOW
Orlando, Florida
RCI, Inc.
www.rci-online.org

18-20

NERCA'S 93RD ANNUAL CONVENTION & TRADE SHOW
Mashantucket Connecticut
North/East Roofing Contractors Association
www.nerca.org

APRIL

3-4

ROOFING DAY IN D.C. 2019
Washington, D.C.
National Roofing Contractors Association
www.nrca.net

4

CERTA TRAIN-THE-TRAINER AUTHORIZATION
Elgin, Illinois
National Roofing Contractors Association
www.nrca.net

10

FOR FOREMEN ONLY, LEVEL ONE
Rosemont, Illinois
National Roofing Contractors Association
www.nrca.net

10-12

NRCA'S QUALIFIED TRAINER CONFERENCE
Joliet, Illinois
National Roofing Contractors Association
www.nrca.net

16-17

ROOFTECH 2019
Montreal, Quebec
Canadian Roofing Contractors Association
www.rooftech.ca

29-May 1

NRCA'S QUALIFIED TRAINER CONFERENCE
Charlotte, North Carolina
National Roofing Contractors Association
www.nrca.net

MAY

16

CERTA TRAIN-THE-TRAINER AUTHORIZATION
Elgin, Illinois
National Roofing Contractors Association
www.nrca.net

JUNE

6-8

AIA CONFERENCE ON ARCHITECTURE
Las Vegas, Nevada
American Institute of Architects
www.conferenceonarchitecture.com

9-11

WESTERN ROOFING EXPO
Las Vegas, Nevada
Western States Roofing Contractors Association
www.wsrca.com

19-23

CRSMCA 76TH ANNUAL MEETING & SUMMER CONVENTION
Myrtle Beach, South Carolina
Carolinas Roofing and Sheet Metal Contractors Association
www.crsmca.org

25-26

MCA SUMMER MEETING
Rosemont, Illinois
Metal Construction Association
www.metalconstruction.org

MORE...

VIEW MORE INDUSTRY EVENTS ONLINE AT WWW.ROOFINGMAGAZINE.COM/EVENTS.

IF YOU HAVE AN EVENT TO SHARE, EMAIL IT TO CHRIS@ROOFINGMAGAZINE.COM.

"All things being equal, the simplest solution tends to be the best one." – William of Occam

PEEL & SEAL®
SELF-STICK ROLL ROOFING

We couldn't agree more.

Peel & Seal® is the best and simplest solution for low-slope roof and flashing repairs. Just peel off the release liner, press into place, and roll smooth to seal the leak. That's all it takes. Leave exposed for years of worry-free protection.

mfm BUILDING PRODUCTS CORP.

Learn more at www.mfmbp.com or by calling 800-882-7663.





MATERIALS & GADGETS

Concrete Roofing Tiles Available in Five New Colors

Boral Roofing LLC introduces a collection of five new concrete roofing tile colors inspired by the natural beauty of California. Each of the new neutral shades is available in four tile profiles designed to complement the state's three emerging home architectural styles – traditional, transitional and contemporary. Boral Roofing's new hues include: Graphite, Sepia, Shadow Black, Oceana and Saddleback Blend. The collection offers a Class A fire rating, as well as additional protections from the weather and elements. Boral Roofing's concrete tile is fully recyclable at the end of its life on the roof, reducing landfill waste.

www.BoralRoof.com | **Circle No. 18**

Rooftop Walkway System Features Integrated Safety Railing

Kee Safety Inc. introduces Kee Walk with Guardrail, an OSHA-compliant rooftop walkway system with an integrated safety railing. Designed to provide a secure, anti-slip walking surface on all roof types including metal profile and standing seam roofs, Kee Walk with Guardrail accommodates steps, traverses, and sloped roofs with pitches up to 35 degrees, according to the company. Kee Walk with Guardrail helps to eliminate potential fall hazards by presenting a clear demarcation route for personnel accessing the roof. The corrosion-resistant walkway-railing system is compatible with other Kee Safety fall protection products to deliver a complete rooftop safety solution, according to the company.

www.KeeSafety.com | **Circle No. 19**

Self-Adhering, High-Temperature Roofing Underlayment

MFM Building Products unveils a high-temperature roofing underlayment, Premium HT Tile & Metal. This self-adhering roofing underlayment is composed of a high-grade, reinforced polyester fabric laminated to a high-temperature asphalt adhesive system. This premium product also has a fiberglass-reinforced core for extreme durability. Product features a 3-inch (7 cm) selvedge edge to ensure a secure, monolithic seal. The surface fabric offers excellent foot traction and for stacking tiles during construction. UV exposure is 180 days. Premium HT Tile & Metal will withstand the high temperatures created by metal and tile roofing with a high temperature rating of 250°F (121°C).

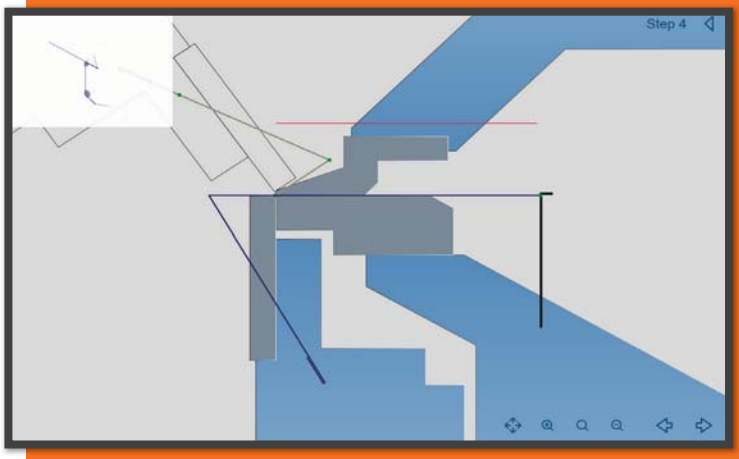
www.MFMbp.com | **Circle No. 20**

PVC Pressure-Sensitive Cover Strip Eliminates Need for PVC-Coated Metal

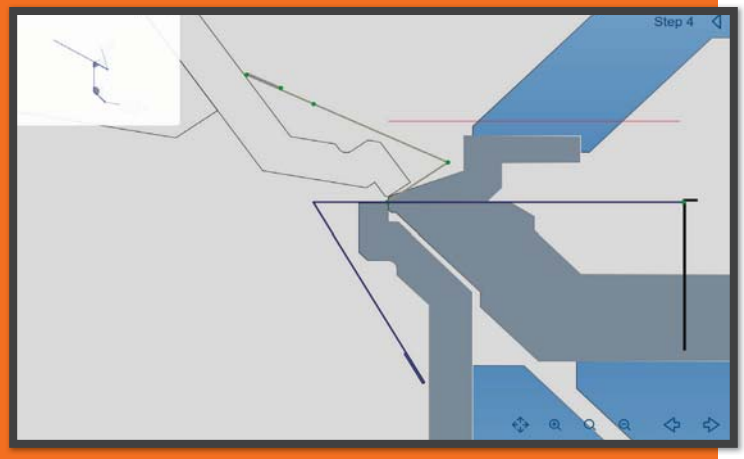
Carlisle SynTec Systems introduces Sure-Flex PVC Pressure-Sensitive (PS) Cover Strip, a groundbreaking new product designed to help contractors save time, labor, and money. Carlisle's new PVC PS Cover Strip is used for stripping-in flat metal edging and eliminates the need for costly PVC-coated metal or two-piece clip-on edge metal. PVC PS Cover Strip is compatible with a variety of metal finishes and is quick and easy to install; no welding is required. Simply apply PVC Step 1 Activator, followed by PVC Step 2 Primer, then install the PVC PS Cover Strip.

www.CarlisleSynTec.com | **Circle No. 21**

Once again, we've changed the shape of folding.



PROBLEM: Drip Edge on a regular folder.



SOLUTION: Drip Edge on the Schechtl MAF.

Introducing the Schechtl MAF. Radically enhanced geometry makes difficult profiles easy.

We know you hate making difficult parts on your folders. That's why we've engineered the Schechtl MAF to add the most free space in front of the folding beam—letting you create unlimited shapes and sizes. The result? Difficult parts made easy. To find out all the details, contact us at 770.631.0002 or visit metalforming-usa.com. Problem solved.

METALFORMING ALWAYS INNOVATING

770.631.0002 tel **metalforming-usa.com**

MATERIALS & GADGETS

Porcelain Roofing Tile Replicates Slate, Timber and Clay

Daltile launches its Perennial Porcelain Roofing Tile, which is available in six colors and designs to replicate the look of slate, timber, and clay. According to the manufacturer, Perennial Porcelain Roofing Tiles are easy to install and the low overall weight of Daltile's Perennial Porcelain Roof System adds to the speed of installation. Daltile utilizes its patented, cutting-edge digital printing process, Reveal Imaging, to produce Perennial's tile designs. Made in the U.S.A., Daltile's Perennial tiles offer all of the inherent advantages of porcelain tile: resiliency, longevity, resistance to frost, high breaking strength, imperviousness to water, 110 mph wind rating, Class A fire rating (fire resistant), Class IV hail impact rating, and walkability.

www.Daltile.com/roofing | **Circle No. 23**

Sealer Designed Specifically for Metal Roof Applications

Drop-Stop sealer was specifically designed for application to metal roofs and problem areas such as gutters and expansion joints. According to the manufacturer, **Dynamic Fastener**, Drop-Stop can easily be applied over sloped, contoured surfaces and will give long-lasting, colorful protection. Made from select synthetic rubbers, Drop-Stop is applied as effortlessly as heavy-bodied paints and stretches and recovers to bridge roof joints in which thermal movement can be expected. With 1,500 PSI tensile strength and 600 percent elongation capabilities, the product can singlehandedly tackle most metal repairs. White Drop-Stop is stocked in 20-ounce sausage packs, 1-gallon pails, 5-gallon buckets and 55-gallon drums.

www.DynamicFastener.com | **Circle No. 24**

Modified Bitumen Membranes Feature Highly Reflective Granules

Soprema unveils a new-generation of SOPRALENE SG and ELASTOPHENE SG modified bitumen cap sheets enhanced with 3M Highly Reflective Granules. These new-generation granulate-surfaced cap sheets bring improved durability and an even brighter white appearance to the market. Moving forward, the new 3M ultrareflective granule will be integrated into Soprema SG products to create solutions that provide the solar reflective index (SRI) ratings needed to comprehensively meet the highest U.S. and Canadian reflectivity requirements while providing the proven protection factor of multi-ply SBS-modified bitumen systems. The new lightweight cap sheets also feature robust opacity, protecting the asphaltic layer and extending the life span of the rooftop.

www.Soprema.us | **Circle No. 25**

New Products Added to Roof Coating Line

EPDM Coatings announces the addition of several new products to its roof coating line, including its 97 percent volume solid EnergyMax, Bonding Primers, Rust Inhibitors and Clear-Coat specifically designed for coating skylights, brick and stucco. EPDM Coatings provides its customers worldwide with a full range of products, including many that have been ASTM tested and CRRC rated, Miami-Dade approved, as well as NSF approved for potable water applications. The company offers solutions for almost all types of roofs, including built-up, modified bitumen, metal, concrete, TPO, EPDM and foam. Also, for roofs on a budget, one base coat of the aromatic polyurethane can fix most leaks, and the application can be completed after a year to get the full benefits of a system.

www.EPDMcoatings.net | **Circle No. 26**

PROGRESSIVE MATERIALS

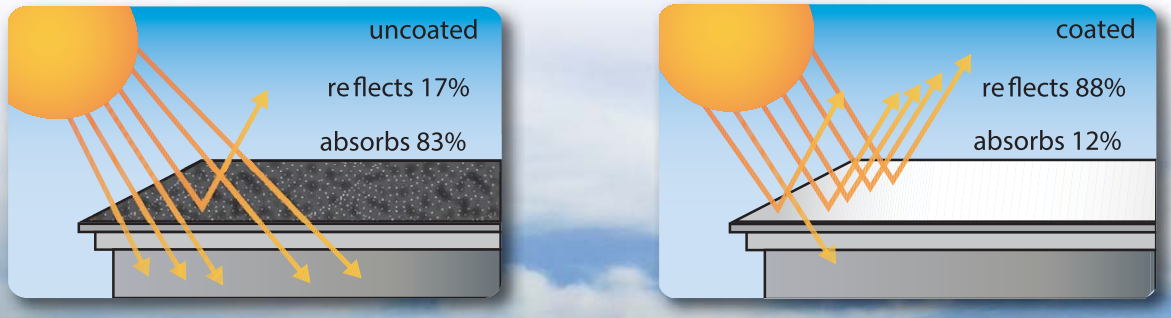
SILICONE ROOFING SYSTEMS

White silicone roofs can reflect up to 88% of the suns' UV rays.

Keep your clients' building **cool**.

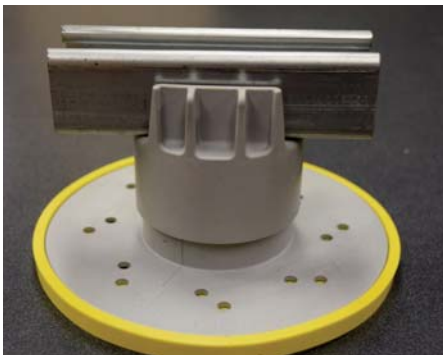
Save your clients money.

Win more work.



pmsilicone.com

MATERIALS & GADGETS



Redesigned Strut Support Provides Improved Performance

Green Link Engineering offers its redesigned KnuckleHead Strut Support, which provides improved performance and more visually appealing aesthetics. The new design features a sleeker look with ribs flanking each side of the head. The new strut head features a 1 1/8-inch deep cavity for holding a standard steel strut. When mechanically fastening the strut into place, bolts or screws pass through the side of the head into the metal strut. The new design features a flat surface, instead of the previous curved design, resulting in easier installation and a tighter fit between screw and head. With shear strength of up to 275 psi, Green Link Adhesive/Sealant can replace mechanical fasteners making for easier installation.

www.GreenLinkEngineering.com
Circle No. 28

Reinforced Laminated Shingles Offer Class 4 Impact Resistance

TAMKO Building Products Inc. is expanding its popular Heritage line of laminated asphalt shingles to include a new Heritage IR shingle. The innovative new reinforced shingle is classified by the Underwriters Laboratories for compliance with UL 2218 Class 4 Impact Resistance, the highest impact resistance rating UL awards. Naturally deep shadow lines portray the look of wood shakes, and four attractive color choices – Rustic Black, Rustic Slate, Thunderstorm Grey and Weathered Wood – will enable homeowners to find the Heritage IR shingle that best complements their home. Heritage IR shingles will initially be available in Colorado starting in March 2019 and will later be available for stocking in the central and western U.S.

www.TAMKO.com | **Circle No. 29**

Capped Skylight Conversion Kit

Skyco Skylights offers the Capped Conversion Kit, which converts old capless skylights to a more trusted capped system. With the kit, commercial roofers receive a universal fitting Polycarbonate dome, a custom-sized aluminum cap, and Tek Screw with EPDM gaskets. According to the company, using a cap around the perimeter of the polycarbonate dome creates a leak-free seal and eliminates cracking. The custom-fitted aluminum cap is fastened to the skylight frame with Tek-Screws instead of drilling through the plastic dome. Penetrating the dome with screws is a major cause for cracking.

www.SkycoSkylights.com | **Circle No. 30**

Ladder Personal Fall Arrest Systems Comply With OSHA Regulations

Design Components Inc. offers both rigid rail and cable grab style ladder Personal Fall Arrest Systems (PFAS). This is in response to the OSHA requirements that went into effect on November 19, 2018. OSHA regulations now require that all fixed ladders over 24 feet be equipped with a PFAS. Design Components offers a variety of fall arrest systems that meet the new OSHA and existing ANSI standards. These systems are customizable and are packaged together to include the needed accessories, including the attachment hardware, trolleys, cable grabs, and deluxe body harnesses.

www.DesignComponents.com | **Circle No. 31**

100%
MADE IN THE USA

MIAMI-DADE COUNTY APPROVED

MAZE is the only nail manufacturer that can make that claim!

Roofing Nails

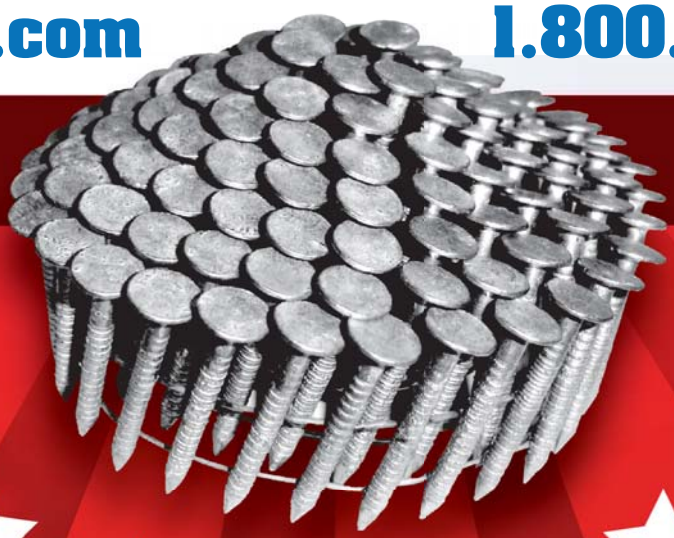
MAZE NAILS
Building America one NAIL at a time

- MAZE double hot-dipped galvanized ring shank roofing nails are **Miami-Dade County Approved!**
- MAZE roofing nails are available in hand drive and coils for easy application!
- MAZE roofing nails are available in both double hot-dipped galvanized and stainless steel!

mazenails.com **1.800.435.5949**

Miami-Dade County, Florida
Notice of Acceptance (NOA)

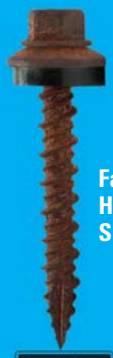
NOA Number: 16-0712.06
Expiration Date: 8/17/21



LAKESIDE
CONSTRUCTION FASTENERS

www.lakeside-fasteners.com

COR-10 WOOD-X



Fastener Dia.: #10
Head Size: 1/4"
Size: 1", 1-1/2", 2", 2-1/2"

THE BEST PRODUCT OF THE 2018 FRAME BUILDING EXPO

T17 MASTERGRIP XL

Fastener Dia.: #14 or 1/4"
Head Size: 3/8"
Size: 2", 2-1/2", 3", 4"

Washer Options:
- 19mm Flat Bond
- 25mm Flat Bond
- 25mm Multi-Seal

T17 FASTLOK

Fastener Dia.: #12
Head Size: 1/4" & 5/16"
Sizes: 3/4"
Special: 1", 1-1/2"

In Stock:

Z8 STITCH

1/2"

Painted 30 Color Choices

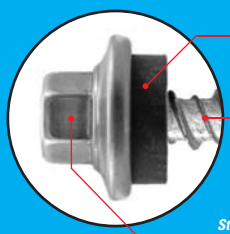
3/4"

Painted Black Only

SC STEEL GUARD

THE BEST PRODUCT OF THE 2017 FRAME BUILDING EXPO

Fastener Dia.: #10
Head Size: 1/4"
Innovation: Stainless HWH
Sizes: 1", 1-1/2" & 2"



Fastener Dia.: #10
Head Size: 1/4"
Sizes: 1", 1-1/2", 2", 2-1/2", 3", 4"

MIAMI-DADE COUNTY APPROVED
NOA#15-0423.02

T17 WOOD-X™

THE BEST PRODUCT OF THE 2018 FRAME BUILDING EXPO

LCF Standard 1/4 Nutsetter

LCF EZ 1/4 Nutsetter

T17 MASTERGRIP™

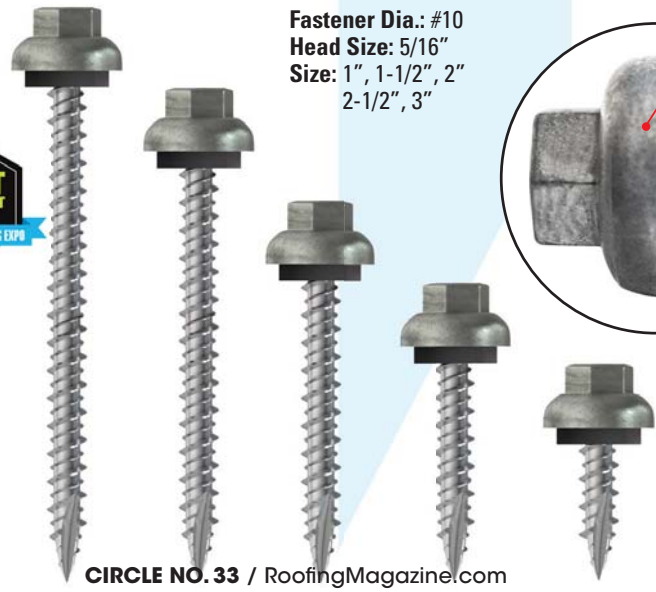
Fastener Dia.: #14 or 1/4"
Head Size: 5/16"; 3/8"
Sizes: 1", 1-1/2", 2", 2-1/2", 3", 4"

300 Rivets Stainless Steel

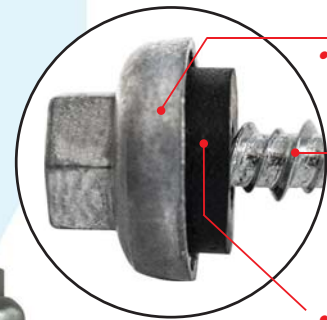
- Stock 40 Standard Colors!
- 300 Stainless Steel!

ZMAX™

"THE LONGLIFE FASTENER"



Fastener Dia.: #10
Head Size: 5/16"
Size: 1", 1-1/2", 2" 2-1/2", 3"



Spin Dip

Powder Coat

Wet Paint

LAKESIDE™
CONSTRUCTION FASTENERS

SC110VENT™
Your Complete Ridge Venting Solution!

Packaging:
- 10 ft Roll (10 rolls/carton)
- 50 ft Roll (36 rolls/carton)
- 2.25" (6 rolls/carton)

Sizes:
- 10' x 1.25"/2.25"
- 10' x 1.50"
- 50' x 1.25"
- 2" Wide

- Dade County (HWHZ) 110 MPH Approved!
- Florida Building Code Approved! (FL # 4640-R1)
- 2 Adhesive Strips for Secure Installation!

SC110VENT-R™
Your Complete Ridge Venting Solution!

Packaging:
- 10 ft Roll (10 rolls/carton)
- 10 ft Roll (220 rolls/tote)

Sizes:
- 10' x 1.25"
- 2" Wide

- Designed for Low Cost Installation!
- Full Adhesive Strip for Secure Installation!
- 40 Year Limited Warranty!

SC110VENT-FLEX™
LOW COST IN-PLACE INSTALLATION

Packaging:
- 20 ft Roll (65 rolls/tote)
- Each Roll Shrink Wrap

Sizes:
- 20' x 1.25"
- 2" Wide

- Highly resistant to moisture!
- Seals out dust, debris & wind-driven rain!
- Conforms to multiple metal panel profiles!

STRIP LX™
RETRO-FIT

Packaging:
- 150 ft Roll (2 rolls/carton)
- 14 cartons/pallet

Sizes:
- 0.25" H x 2.5" W x 150' L

- Allows Air Flow Under Metal Panels!
- Will Not Decay or Breakdown!
- Designed to Retrofit Shingle Roofs!

SV2 PROFILE CLOSURE™
WEATHER RESISTANT BARRIER!

3/4 AG Panel:

34HRSV2PC - 3/4" X 36" SV2 HIGH RIB VENTING CLOSURE, 9" ON CENTER

R-PANEL/PBR:

114RPSV2PC - 1-1/4" X 36" SV2 R-PANEL VENTING CLOSURE, 12" ON CENTER

SV3 PROFILE CLOSURE™
WEATHER RESISTANT BARRIER!

3/4 AG Panel:

34HRSV3PC - 3/4" X 36" SV3 HIGH RIB VENTING CLOSURE, 9" ON CENTER

R-PANEL/PBR:

114RPSV3PC - 1-1/4" X 36" SV3 R-PANEL VENTING CLOSURE, 12" ON CENTER

VAL3 Panel:

34VAL3SV3PC - 3/4" High Rib VAL3 Panel Closure w/Secure Vent (25 Pcs/Carton)

5/8 ProFit Panel:

58PFSV3PC - 5/8" High Rib Pro Fit Panel Closure w/Secure Vent (45 Pcs/Carton)

MADE IN THE USA

SEAM-VENT™
STANDING SEAM VENTING SOLUTION

10SS12SVPC - 12" On Center Standing Seam Closure (25 Pcs/Carton)

10SS16SVPC - 16" On Center Standing Seam Closure (28 Pcs/Carton)

FOLLOW US ON

YouTube

EMSEAL®

AST Hi-Acrylic
Metal Building Sealant
Multiple Sizes in Stock!

- Will not dry out and become hard and brittle
- UV-stable!
- Highly resistant to seal out dust, air, wind-driven snow, & moisture!
- Conforms to metal panel contours and fills gaps!
- Maintains a seal during thermal expansion and contraction!
- Excellent compressibility and recovery!

PROGUARD SEAL™
EXPANDED UNIVERSAL CLOSURE

Sizes:
1" x 1" x 20'
(50 rolls/carton)
1.5" x 1.5" x 20'
(36 rolls/carton)
2" x 2" x 20'
(18 rolls/carton)
1.5" x 1.5" x 25'
(30 rolls/carton)

- Engineered Weather Barrier!
- Patented UV Inhibitor Coating!
- Patented Anti-Microbial Coating!
- 20 Year Limited Warranty!
- Adhesive Full Width and Length!

RIDGE-X™

Lakeside Construction Fasteners Ridge Vent Features:

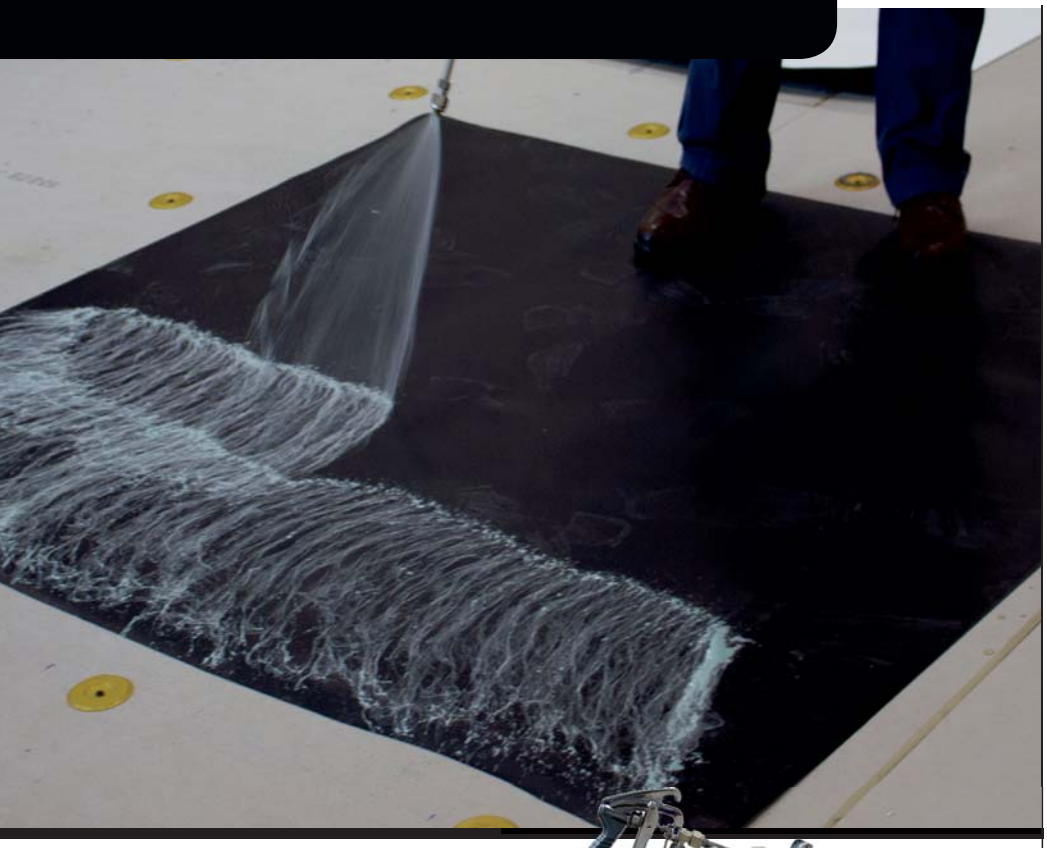
Size per Roll:
2-1/2" W x 1" H x 20' L

(2 Rolls / Pack)

- 14.1 sq. in. Net Free Area / Lineal Ft.
- Fits Under Any Ridge Cap
- Fits Any Pitch, Consult Manufacturer's Instructions for Limitations
- One Person Roll-out Installation
- Prevents Insect & Snow Infiltration
- Provides Proven Roof Ventilation
- Meets All Model Building Codes
- Almost Invisible from the Curb
- No Waste

Size per Roll:
1-1/2" W x 3/4" H x 50' L

(2 Rolls / Pack)



Versatile Adhesive Goes on 60 Percent Faster, Flashes Off Quickly

AeroWeb's low-VOC, methylene chloride-free formula provides powerful adhesion and a quick drying time in a wide range of temperatures, helping contractors avoid weather-related delays.

The new AeroWeb Low-VOC Aerosol Contact Adhesive/Primer from Mule-Hide Products Co. was designed to boost productivity. According to the manufacturer, the product delivers aggressive adhesion and a quick drying time while going on as much as 60 percent faster than traditional roller-applied adhesives.

The new adhesive can be used in a wide variety of applications, including adhering standard TPO and standard EPDM membranes to horizontal and vertical surfaces; adhering fleece back membranes to vertical surfaces; enhancing the bond between Mule-Hide F5 Air & Vapor Barrier and various substrates; and priming unexposed asphalt prior to applying Mule-Hide Helix Low-Rise Adhesive for insulation attachment.

AeroWeb's low-VOC (volatile organic compound), methylene chloride-free formula provides powerful adhesion and a quick drying time in a wide range of temperatures, helping contractors avoid weather-related delays. It can be applied as an adhesive or primer in ambient temperatures as low as 25 degrees Fahrenheit.

Fast, even aerosol application saves crews time while also increasing the coverage rate. Applied using a self-contained spray system, AeroWeb goes on up to 60 percent faster than traditional roller-applied adhesives. The web-like spray pattern also means that the adhesive must be applied to just 75 percent of the surface, versus 100 percent coverage with roller-applied adhesives.

A short tack time and long application window further boost crew productivity. AeroWeb flashes off in less than five minutes, so crews aren't kept waiting. AeroWeb then remains sticky longer, enabling crews to work with larger sections of membrane.

According to the company, setup is minimal and clean-up of tools and surfaces is fast and easy using UN-TACK safe solvent or mineral spirits. AeroWeb complies with VOC-related regulations in all 50 states. It is sold in #40 cylinders filled with 30 pounds of adhesive. One cylinder typically covers 1,000 square feet when used as a contact adhesive. R

MARCH/APRIL 2019 ROOFERS' CHOICE Roofing

The "Roofers' Choice" winner is determined by the product that receives the most reader inquiries from the "Materials & Gadgets" section in a previous issue. This product received the most inquiries from our November/December 2018 issue.

LEARN MORE

Visit: www.mulehide.com
Call: (800) 786-1492

Circle No. 34

NB HANDY

THE PREFERRED CHOICE SINCE 1891

OUR **PRODUCTS**

Metal

- We have the most comprehensive metal offering of any manufacturer or distributor in the region including Sentrigard Metal Roofing Systems, Sentriclad Architectural Metals, and Fabral Architectural Metals

Membrane

- With over 20 years experience with Carlisle Commercial Low Slope Roof Systems, no one knows Carlisle like N.B. Handy

Machinery

- If you bend, shear, crimp, fold, notch, fasten, cut, or bead metal, we have your machine.
- New and used machines available

OUR PERFORMANCE

- We provide what you need, when you want it, where you need it
- Our Professional Services include shop drawings, engineering, tapered design, and specifications development

FLORIDA OPENING JANUARY *2019*

NB HANDY
THE PREFERRED CHOICE SINCE 1891

Charlotte (704) 921-1230
Greensboro (336) 668-0092
Greenville (864) 235-3470
Hanover (443) 561-9090
Lynchburg (434) 847-2498
Norcross (678) 225-0012
Norfolk (757) 857-8300
Raleigh (919) 212-2090
Roanoke (540) 343-2467
Rosedale (410) 866-0590
Richmond (804) 354-9576
Springfield (855) 350-6242
West Columbia (803) 791-0900
Corporate Office (434) 847-4495
Steel Services Center (434) 847-2473
Machinery Group (434) 847-2494

Discover the N.B. Handy Difference • **www.nbhandy.com**

WRITTEN BY **FELICIA M. HAIGH**

Examining Workplace Policies in the Era of Legalized Marijuana Use

LEGALIZATION OF marijuana continues to be a topic of great interest and debate throughout the country. For example, Acreage Holdings, a U.S.-based cannabis firm, made a splash in the news when their ad spotlighting the use of medical marijuana for pain relief was denied a commercial slot during this year's Super Bowl.

The legalization of marijuana, whether it be for recreational or medical use, is an issue our country continues to struggle with as lawmakers weigh the costs and benefits of legalizing the drug. Despite the fact that marijuana remains a Schedule I controlled substance under federal law — the Controlled Substance Act — to date recreational use of marijuana is legal in 10 states and the District of Columbia, and medical marijuana use is legal in 33 states and the District of Columbia.

There appears to be a growing trend of legalizing marijuana use in one form or another. In fact, on December 6, 2018, Forbes reported in its article titled "Marijuana's Ten Biggest Victories of 2018," just in the previous year Vermont lawmakers approved a marijuana legalization bill allowing growth and possession of small amounts of cannabis; voters in Missouri, Oklahoma, and Utah approved ballot measures for medical marijuana use; and Michigan voters approved a ballot measure for legal recreational marijuana use.

With this growing trend toward legalizing marijuana, many employers may be left wondering how this will impact their businesses. Ensuring workplace safety should be a primary concern for any employer, particularly in the construction industry where employees may be operating heavy equipment or driving company vehicles. Right now, many companies may be relying on drug-free workplace policies to address those safety concerns. While these policies may be able to handle issues of recreational marijuana use, just as an employer can terminate or otherwise take disciplinary action against an employee who shows up to work intoxicated due to alcohol consumption, when medically prescribed marijuana is involved, this issue gets a little more complicated.

There is nothing inherently wrong with having a drug-free workplace policy. However, some recent cases have indicated that legalization of medical marijuana use could throw a wrench in the way in which an employer is allowed to enforce its drug-free workplace policy. Particularly, this can be an issue for employers in states where the medical marijuana laws include anti-discrimination or other employment provisions.

One example is Connecticut's medical marijuana legislation, the Palliative Use of Marijuana Act (PUMA). PUMA prescribes qualifying conditions for a person to use marijuana for medicinal purposes. PUMA also contains an anti-discrimination provision that bars an employer from refusing to hire a person or from discharging, penalizing or threatening an employee based on an employee's status as a qualifying medical marijuana patient. The statute further provides that it does not restrict an employer's ability to prohibit the use of intoxicating substances during work hours or restrict an employer's ability to discipline an employee for being under the influence of intoxicating substances during work hours.

In 2017, in Noffsinger v. SSC Niantic Operating Co. LLC, the US District Court for the District of Connecticut denied in part an employer's motion to dismiss

plaintiff's state discrimination claim when her offer of employment was rescinded after testing positive for cannabis. In Noffsinger, the plaintiff accepted a job offer from the employer which was contingent on drug testing. The plaintiff informed the employer she qualified as a medical marijuana user under PUMA for treatment of PTSD. When the plaintiff's drug test came back positive for THC, the employer rescinded the offer.

The plaintiff filed a lawsuit against the employer and the employer filed a motion to dismiss her claim. The employer's primary argument for dismissal of the claim was based on the assertion that PUMA was preempted by federal law. The court disagreed with this assertion and further found that PUMA creates a private right of action.

With this growing trend toward legalizing marijuana, many employers may be left wondering how this will impact their businesses.

In 2018, the US District Court for the District of Connecticut heard motions for summary judgement on plaintiff's discrimination claim and the Court held that the employer violated PUMA by rescinding the plaintiff's job offer.

The Noffsinger case appears to illustrate the idea that while an employer is not prohibited from having a drug-free workplace policy, Connecticut law prohibits the policy from being used in a decision of hiring or to take action against an employee for their medically prescribed, off-duty marijuana use.

What remains a wildcard is how courts will handle discrimination claims in states where their medical marijuana legislation does not contain any explicit employment protections. A recent Massachusetts case (Barbuto v. Advantage Sales & Mktg., LLC et al.) could prove to be fairly groundbreaking in that regard. Massachusetts' laws regulating the use of medical marijuana do not contain explicit anti-discrimination or employment provisions. However, in July 2017, the Supreme Judicial Court of Massachusetts reversed the dismissal of an employee's discrimination claim against her employer when she was terminated from her employment because she tested positive for marijuana as a result of her lawful medical marijuana use.

This was a scenario that involved an employee prescribed marijuana for treatment of her Crohn's disease, and the employee claimed she would use small quantities when at home a couple of times per week to maintain a healthy appetite. The employer was informed of her medical marijuana use and informed the employee that it should not be a problem. The employee ultimately underwent a drug screen that was positive for marijuana and was terminated due to the positive test results. The Barbuto court's decision provides medical marijuana users the ability to assert claims against their employers for handicap discrimination under the Massachusetts Fair Employment Practices Act.

The Barbuto case, only having gotten past the motion to dismiss phase, still has a long way to go in terms of an ultimate ruling on the matter. Depending on whether a court finds in favor of plaintiff's discrimination claim in this particular scenario has the potential to impact other state courts' decisions in this regard.

Unfortunately, because we are only recently starting to see some of these issues rear their head in the state and federal court systems many of these issues are still in preliminary phases, as is the case with Barbuto. However, what that does mean is in the very near future we are likely to see more courts having to render decisions on these issues and hopefully provide more guidance to employees and employers.

Trying to navigate the waters while legalization of marijuana is still in a period of growth can seem like a daunting task for employers, but there are things that all employers can do to better protect themselves from these types of legal disputes. First, employers need to be familiar with their state and local laws regarding marijuana use; they should also stay up to date on pending legislation or issues on the ballot in their state regarding the same. Having clear and precise policies regarding the workplace can be beneficial, but employers must remember that the state laws vary. Therefore, employers with national companies could be opening themselves up to liability if they simply implement a blanket policy for all locations. R

ABOUT THE AUTHOR: *Felicia M. Haigh is an attorney with Raleigh, N.C.-based Anderson Jones PLLC. Questions about this article can be directed to her at fhaigh@andersonandjones.com.*

AUTHOR'S NOTE

The above article is not, and should not be construed as, legal advice. For specific advice, consult with an attorney licensed in your state.

WRITTEN BY **DAVID KRONENFELD**

Plan for Your Future

Business Succession Planning Tips for Roofers

BUSINESS SUCCESSION isn't as simple as choosing someone who will run your roofing company after you decide to hang your contracting hat up — or an unfortunate event cuts your time as the owner of your business short. Business succession requires you to put into place a plan that will ensure the success of your company after you've moved on. Business succession planning is time consuming, complicated, and dependent upon your business' structure. It is therefore wise to begin thinking of what you want to do with your business long before you will need your plan.

One of the more obvious questions that need to be answered in business succession planning in the roofing industry is who will be the successor. Do you plan on training an employee to take over the company? Is it best to keep the company in the family and to name a family member as the successor? Are there multiple owners and succession will remain within the company? The answer to this question will vary from roofing company to roofing company. For some companies, they may already have a family member who is an employee, making the decision relatively simple. Some newer companies may not have the option to appoint a family member as a successor because the family member is too young or not willing.

Business succession planning is complex, but it can still be broken down into manageable segments to help owners better understand the process. Some of the common components of business succession planning include: buy-sell agreements; gifting; merger and acquisition transactions (M&A); employee stock option plans; key-man life insurance; and management buyouts. A basic understanding of these components will give roofing contractors a good place to begin their business succession planning.

BUY-SELL AGREEMENTS

Buy-sell agreements are especially useful in a multi-partner business to ensure there is an agreed upon plan in the event a partner dies or there is a dispute. Also known as buyout agreements, these types of agreements have control over when someone can sell their interest in a business, who can buy that interest, and the amount which is paid for said interest. What triggers a buy-sell agreement varies, but typically an event such as retirement, bankruptcy, disability, or death will be the triggering event that creates an automatic offer to the current owners of the company to buyout the departing members' interest in the company.

A good example of a buy-sell agreement is the cross-purchase agreement where owners typically purchase insurance policies on one another. Different triggering events (death, incapacitation, age, or something similar) cause the Agreement to go into effect. In a hypothetical cross-purchase agreement arrangement, Owner B, who owns 30 percent of the business, would carry insurance equal to 70 percent of the business value. This allows the remaining partners to continue business as usual without the need to fill the vacant position within the company's ownership.

GIFTING (FAMILY SUCCESSION)

Before the recent tax overhaul, if your estate was above the $5.6 million ($11.2 million for couples) estate and gift tax exclusion, then gifting was an incredibly powerful tool. However, in 2018 the IRS announced that the

2018 federal estate and gift tax limit has been elevated to $11,180,000 for individuals and $22,360,000 for couples, which makes gifting helpful for a smaller subset of business owners. It should be noted that there are some 15 states that impose estate taxes at a lower level than the federal government, and a prudent business owner should consult a professional to see if his or her state enforces their taxes in such a manner.

Depending upon the vehicle chosen and size of your company, taxes will vary from unaffordable to little or nothing. If family succession is the vehicle chosen, states have varying amounts of money which can be gifted without being subject to a gift tax. Certain trusts also allow you as a business owner to transfer in the neighborhood of $10 million without being subject to a gift tax. The amount of taxes due when succession takes place will depend on you and your company's finances and your state's tax laws.

Business succession planning is time consuming, complicated, and dependent upon your business' structure. It is therefore wise to begin thinking of what you want to do with your business long before you will need your plan.

MERGER AND ACQUISITION TRANSACTION

A merger or acquisition transaction with a competitor or company or individual is another method of maximizing the value of your company and retirement as you look to transition away from your business. Oftentimes you won't know if the person that you are handing control of the roofing company over to is going to maximize the value of the company once you leave or if they're going to run the business into the ground and leave your former employees out of a job in the process. By merging with or selling to a larger, proven roofing company with similar culture to your current business, an owner can assure that his or her business will continue to thrive, albeit with a different name, and continue to serve both employees and clients suitably.

Some professional business owners often encounter issues that force them to make the tough decision to sell his or her roofing company and decide that the time has come to pursue other ventures. A sale would allow him or her the freedom (and cash) to pursue other business opportunities, and if he or she so chooses, he or she could still retain a minority ownership in the business so that if the business measures fail, he or she still has a profitable asset in the form of his or her minority position.

EMPLOYEE STOCK OPTION PLANS

An employee stock option plan is also an excellent method for monetizing your business outside of its traditional cash flow and often gives you time to transition out of the business over the course of several years. An employee stock option plan, also known as an ESOP, is a tool that business owners can create to incentivize current employees, all while planning for a smooth transition once the owner exits the business. In its most basic form, an owner seeking to transition out of his ownership role sells the company to a trust (the ESOP), designating key employees (hard-working managers, promising family members, etc.) as beneficiaries, and receives full payment for the business as a loan from a lender (who now controls the ESOP). Over time, the company can make tax-deductible payments to the principal on the loan, which slowly releases equity control from the ESOP to the employees who are listed as beneficiaries.

MANAGEMENT BUYOUT

A management buyout occurs when the management group of a business purchases the roofing company directly from the owner or parent company. The management group typically acquires a loan for the full value of the company, which compensates the transitioning owner for full value of the company without having to liquidate the company's assets. The typical management buyout scenario occurs when an owner is ready to transition control to a group of committed managers, but also wants to ensure that he or she can provide for a spouse or child upon sale of the company. These acquisitions are particularly intriguing for many business owners, as they can be assured that those taking over the company have knowledge of


To really shine in the sun,
you have to weather some storms
GAF
TimberlineHD®
High Definition® Lifetime Shingles
© 2019 GAF 2/19

True for roofs, true for families

Every home deals with the occasional storm—whether it's a summer squall or a growing teenager. But you can help just about any homeowner, anywhere, rest a little easier by recommending a durable GAF Timberline® HD roof.

When homeowners count on you, count on GAF Timberline® HD, North America's best-selling shingle.

gaf.com/timberline

We protect what matters most™

GAF

the business and share the departing owner's vision.

KEY-MAN LIFE INSURANCE

Finally, company paid key-man life insurance can be a good tool to ensure that the company can afford to redeem your share of the company upon your death. This provides cash to your heirs while helping you sleep better at night. Key-man life insurance operates in a similar fashion to your run-of-the-mill life insurance policies. The company takes out a life insurance policy on a key member of the business (often an owner) and names itself as the beneficiary. The company pays the premiums on the policy, and when the owner dies, the company receives the applicable monetary disbursement. In a succession-planning context, you often see key man life insurance policies utilized in situations where an owner is quickly aging or in poor health and wants to ensure that his family is financially stable upon his or her death, but does not necessarily want his family to take control of the company's operations upon the owner's death. When packaged with a management buyout, key man life insurance gives the owner the ability to do just that. It ensures a smooth transfer of control to a group of trusted employees and guaranteed compensation for the family upon the owner's death.

As it should now be clear, business succession is necessary, time consuming, and requires a number of difficult questions to be made. If you do not have a business succession plan in effect, or you've come to the realization that your business succession plan isn't as reliable as you believed, the time is now to start planning for the future of your roofing company.

ABOUT THE AUTHOR: *David Kronenfeld is an attorney at Cotney Construction Law who focuses his practice on a broad range of transactional matters. Cotney Construction Law is an advocate for the roofing industry and serves as General Counsel for FRSA, RT3, NWIR, TARC, TRI, WSRCA and several other industry associations. For more information, visit www.cotneycl.com.*

AUTHOR'S NOTE

The information contained in this article is for general educational information only. This information does not constitute legal advice, is not intended to constitute legal advice, nor should it be relied upon as legal advice for your specific factual pattern or situation. Regulations and laws may vary depending on your location. Consult with a licensed attorney in your area if you wish to obtain legal advice and/or counsel for a particular legal issue.

First Impressions Are Everything.

Don't Let The Black Streaks Caused By Algae Ruin It.

A Brand You Know And Trust **25+** years of proven performance.

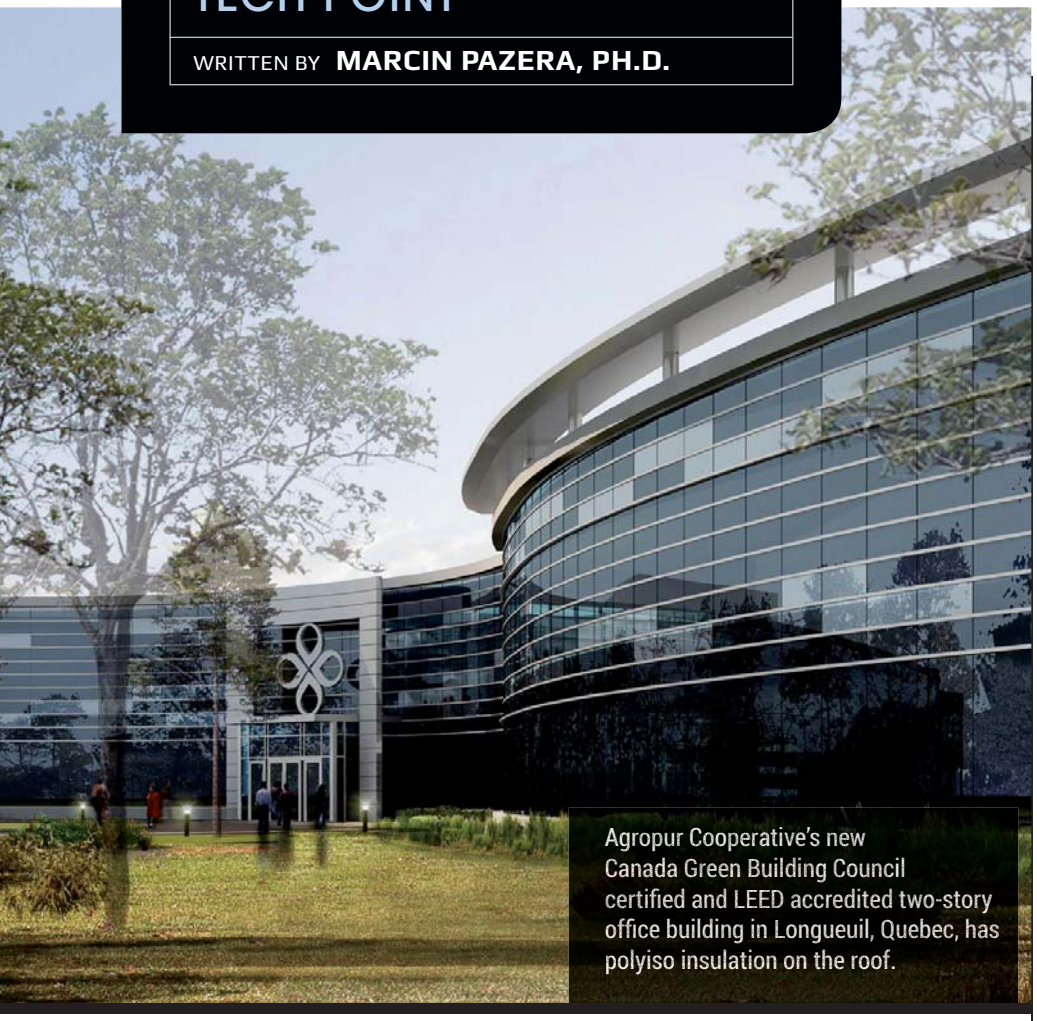
HOLMES. | **APPROVED PRODUCTS**

"I've been a contractor for over 35 years, and I know the right products for the right job. I only partner with brands that share my core values – quality, integrity, and trust. 3M has all of those in spades."

– Mike Holmes
Professional Contractor and TV Host on HGTV and DIY Network

TECH POINT

WRITTEN BY **MARCIN PAZERA, PH.D.**



Agropur Cooperative's new Canada Green Building Council certified and LEED accredited two-story office building in Longueuil, Quebec, has polyiso insulation on the roof.

The ABCs of EPDs

Environmental Product Declarations Are a Driving Force for Change

WITH A WORLDWIDE population that continues to grow (estimated at more than nine billion by 2050), demand for natural resources is increasing at rates that threaten to stress sustainable supply. Over the last few decades, society has become increasingly concerned about the environmental impacts of human activity. The U.S. Department of Energy estimates that the built environment accounts for 41 percent of our national energy consumption and nearly as much of our greenhouse gas emissions. With an eye toward conserving resources and mitigating climate change and its effects, the building industry is on the front lines of the effort to achieve sustainability goals and create buildings that not only drop jaws, but also lower carbon footprints.

Sustainability is not a one-time event, but a process that encompasses the whole life cycle of a building. To effectively ensure that resource conservation spans that whole cycle requires transparency and coordination between stakeholders starting at the beginning of the design process to assess choices based on economy, durability, utility, and sustainability. Architects and specifiers need to have a complete picture of the merits of any product that might go into a building so they can make informed decisions that include impacts from a product's manufacturing process to its long-term applied performance.

In the United States, the Leadership in Energy and Environmental Design (LEED) standards developed by the U.S. Green Building Council have emerged as an important benchmark for rating individual building components, processes, and systems. They are designed to:

- Promote the efficient use of energy, water, and other resources.
- Protect occupant health and improve productivity.
- Reduce waste, pollution, and environmental degradation.
- Improve resiliency in the face of extreme conditions.

Other notable programs across the globe and throughout North America, including the Building Research Establishment Environmental Assessment Method (BREEAM), Green Globes, US Department of Energy's Energy Star program, GreenStar, and the Living Building Challenge, employ standards that are used in concert with LEED ratings to boost performance and promote a conscious approach to resource use in building construction, operation, and maintenance.

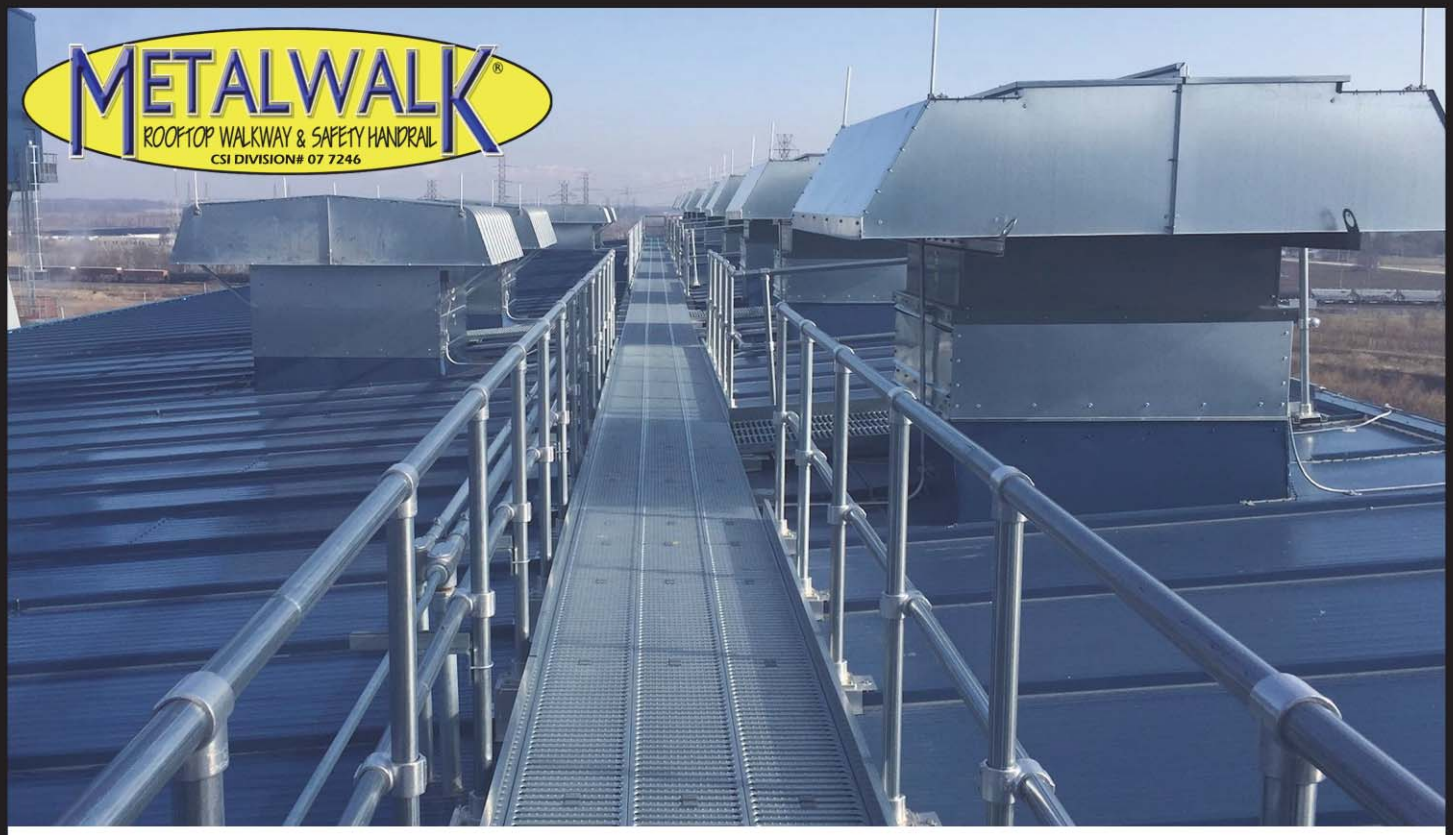
Many manufacturers are publishing rigorous, third-party verified evaluations of the whole life cycle impacts of their products to increase transparency and allow easier comparison of alternatives. These Environmental Product Declarations (EPDs) are similar to a "nutrition label" for building products and include information on sourcing, production, and performance of the products in a standardized and independently verified format that is recognized globally and based on International Organization for Standardization (ISO) standards. This consistent and scientific method to measuring and reporting information makes it possible to consider a product's comprehensive impact and allows to base specification choices on measurable projections.

Earlier versions of LEED allowed manufactures to make claims about a product's sustainability in one area without disclosing deficits in another area. This led to a healthy skepticism

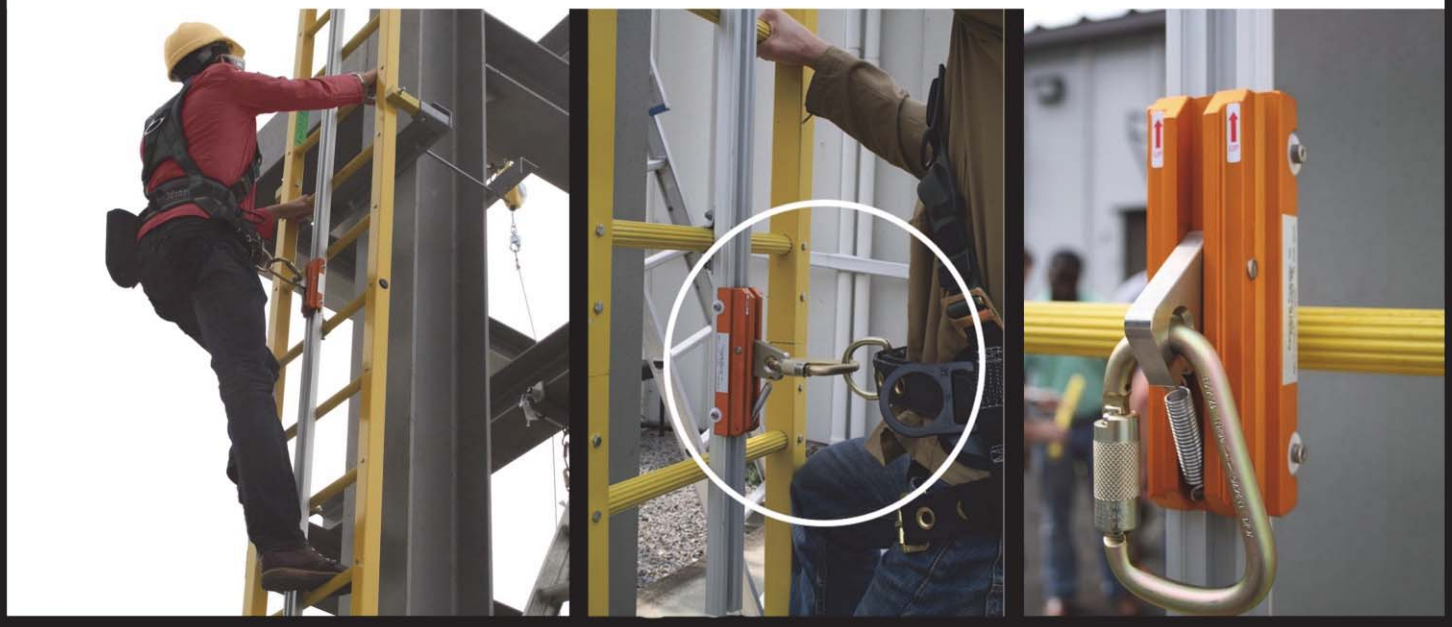
PHOTOS: HUNTER PANELS

FALL PROTECTION!

ROOFTOP WALKWAY CSI 07-7246



Meets new OSHA Ladder Standard : Personal Fall Arrest System (PFAS) 24'+ Climbs



METALWALK® & LADDER FALL PROTECTION

- OSHA/IBC Tested & Rated Safety Handrail System
- OSHA Compliant Roof Access Ladder Systems
- OSHA Ladder Fall Arrest Systems Now Available

DESIGN COMPONENTS, INC. DC inc. metal building accessories since 1978

OSHA®

PH: 800-868-9910 / www.designcomponents.com / sales@designcomponents.com

Polyiso roof and wall insulation offers high unit R-value per inch, zero ozone depletion potential, and outstanding fire performance. In this photo, polyiso roof insulation is being installed on a flat roof.

from clients and consumers about advertised merits and prompted a move toward greater transparency and verifiability. In its most recent revision, the LEED v4 standard asks manufacturers to provide more detailed information on a material's content and its comprehensive environmental impact before their individual products can claim sustainability designations.

BASIS FOR EVALUATION

For an EPD to have a scientific basis, the impacts need to be clearly defined and linked to important environmental concerns. To help define these impacts the U.S. Environmental Protection Agency (EPA) developed TRACI, the Tool for the Reduction and Assessment of Chemical and Other Environmental Impacts. TRACI methodology identifies a number of important factors related to critical environmental impacts:

- Global Warming Potential (GWP)—linked to global climate change.
- Ozone Depletion Potential (ODP)—related to the (now closing) hole in the earth's ozone layer caused by certain chemicals.
- Smog Creation Potential—linked to car exhausts, power plant emissions and fumes from products that contain volatile organic compounds (VOCs).
- Acidification Potential—linked to acid rain caused by certain smokestack emissions.
- Eutrophication Potential—linked to excessive amounts of nitrogen in rivers and lakes causing algae blooms that consume vital oxygen in the water.

COMMON STANDARDS FOR COMPARISON

The EPD process is based on a framework to ensure that these practices are conducted in a consistent and reliable manner anywhere in the world. It includes the following key steps:

- Product Category Rule – products with similar functions are assessed in the same way using comparable measures.
- Life Cycle Assessment – products are evaluated based on inputs in the form of resources and energy, and outputs in the form of emissions and waste for their life cycle either from "cradle-to-gate" (from raw material extraction until it reaches the "gate" of the manufacturing facility) or the more rigorous "cradle-to-grave" (goes beyond the gate to include transportation, product manufacturing, use phase and the product's end of life).
- EPD generation – information from this assessment is organized into the standardized format for publication, including a life cycle diagram, illustration of product components, and a summary of impacts.
- Third-party validation – outside experts verify and evaluate the report and the research that underlies it.

The widespread adoption of EPDs is fostering change in the building products industry leading to even more ambitious sustainability goals. As a growing body of EPDs are published, they contribute to a reliable catalog of data available as a reference point to help identify markets for new products and potential areas for improvement. Manufacturers can easily evaluate which steps in their products sourcing and production could be optimized for sustainability. Comparative information can serve as motivation for product innovation, leading to better options and better outcomes for the whole industry. R

ABOUT THE AUTHOR: *Marcin Pazera, Ph.D., is the Technical Director for Polyisocyanurate Insulation Manufacturers Association (PIMA). He coordinates all technical-related activities at PIMA and serves as the primary technical liaison to organizations involved in the development of building standards. For more information, visit www.polyiso.org.*

EPDS CONFIRM THE BENEFITS OF POLYISO

EPDS FROM the Polyisocyanurate Insulation Manufacturers Association (PIMA) report the results of an exacting "cradle-to-grave" Life Cycle Assessment showing the merits of polyiso insulation for wall and roof applications. The findings include:

- The energy savings potential of polyiso roof and wall insulation over a typical 60-year building life span is equal to up to 47 times the initial energy required to produce, transport, install, maintain, and eventually remove and dispose of the insulation.
- Polyiso has a high return on embodied energy.
- Polyiso roof and wall insulation offers high unit R-value per inch, zero ozone depletion potential, recycled content, opportunity for reuse, and outstanding fire performance.

Evaluation for the third-party assessment was done by PE International and includes a cradle-to-grave life cycle assessment that covers every step in the process of creating and using polyiso products. Looking at everything from resourcing, production, transport, installation, maintenance, to eventual removal and replacement, the EPD measures impacts across a broad

PHOTOS: HUNTER PANELS

Protecting Roofs and Reputations up to **130 mph**.

What keeps you up at night? Is it the howling wind, or worry over what it might be doing to your reputation? Wake up to peace of mind with IKO's Dynasty Shingle featuring ArmourZone™. You'll sleep better knowing your roofing jobs are covered by a 130 mph (210 km/h) Limited Wind Warranty[1]. The ArmourZone is an oversized 1-1/4" wide nailing area reinforced by a tear-resistant, woven band inserted into and extending beyond the common bond. It makes nail placement easy and helps prevent pull through in high winds. So go ahead. Elevate your game with IKO Dynasty Shingles. You'll sleep easier, and your customers will too. To learn more, **1-888-IKO-ROOF** (1-888-456-7663) or visit **roofingelevated.com**.

[1]See Limited Warranty for complete terms, conditions, restrictions and application requirements.

IKO® Dynasty®

roofingelevated.com

spectrum, including everything from how products might contribute to global warming, smog production, and ozone depletion to the energy and water use and waste disposal required at the end of its life.

Primary data from six PIMA manufacturer members was used for the underlying life cycle assessment and the EPD represents the combined weighted average production for these members.

WHAT IS POLYISO?

Polyiso is a closed-cell, rigid foam board insulation consisting of a foam core sandwiched between two facers. In wall applications its facers, which are usually made of kraft paper-backed foil, are adhered to both sides of the foam before it is cut into sheets and packaged for shipment and the boards function both as continuous insulation—creating a thermal barrier that isn't interrupted at every stud—and as an environmental envelope to protect the building from water, air, and heat infiltration. It is typically attached outside the wall framing and covered by an exterior finish.

It is the most widely used insulating material for above-deck commercial roof construction in North America. The boards are installed in one or more layers, depending on the insulation needs, on the steel, wood, or concrete roof deck structure and then covered with the roofing membrane.

EPD POLYISO FINDINGS

- **High thermal efficiency.** Because it is one of the most thermally efficient building insulations available in today's marketplace, Polyiso requires less total thickness to deliver specified R-value in roof and wall assemblies, reducing overall construction costs and increasing usable building space.
- **High net return on embodied** energy. A recent study comparing initial embodied energy to long-term energy savings achieved over 60 years in a typical commercial building suggests that the net energy savings potential of Polyiso wall insulation ranges between 20 and 47 times the initial embodied energy required to produce, transport, and install the Polyiso insulation.
- **Zero ozone depletion potential.** All PIMA Polyiso manufacturer members produce rigid foam board with third-generation, zero ozone-depleting blowing agents. The blowing agent (pentane) used in Polyiso also is among the lowest in Global Warming Potential.
- **Recycled content.** Polyiso insulation typically is manufactured using recycled material. The percentage of the recycled material by weight depends on the individual manufacturer, the thickness of the product, and the type of facer.
- **Opportunity for reuse.** Although this declaration assumes the Polyiso wall insulation boards will be landfilled at the end of the wall assembly service life, it is possible to salvage and reuse the boards, either at the original site or on another construction site. Used Polyiso wall insulation may be collected and resold by several national logistics firms.

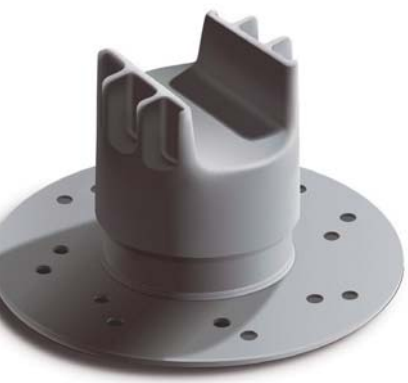
PIMA is currently updating its EPDs for polyiso wall and roof insulations, which will be available in Q1 of 2020. R

PHOTO: JOHNS MANVILLE

No Sleepers on the Job!

Support Rooftop Pipelines & Equipment with

KnuckleHeads



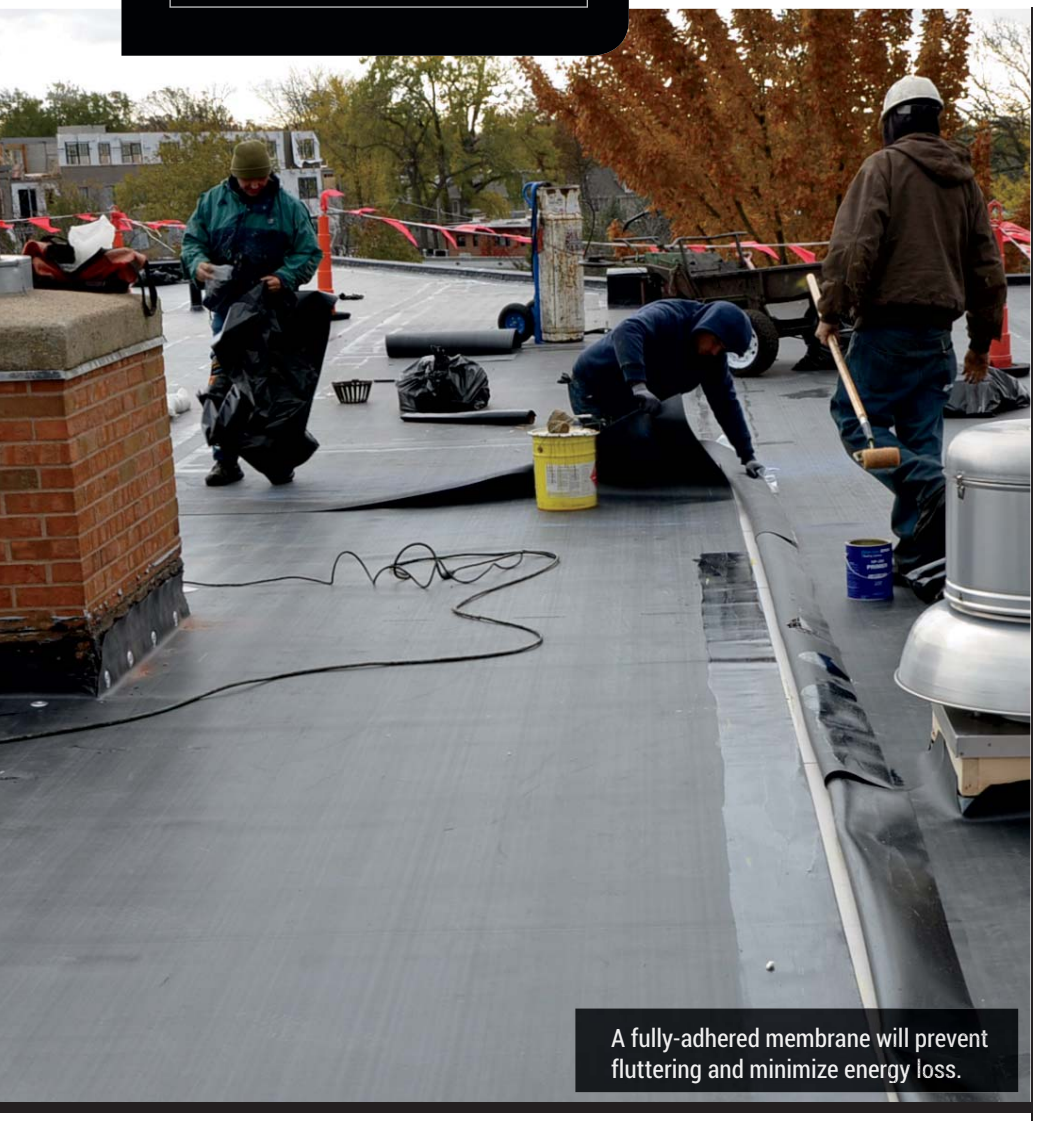
The use of wood sleepers for rooftop support of pipelines and HVAC equipment is on the way out. Even treated wood deteriorates from weathering and biological attack, causing pipelines to sag and HVAC equipment to tilt. KnuckleHead rooftop supports install just as easily as wood blocks — they can be loose laid but also attached where needed — and they will not deteriorate from weathering or UV exposure. Further, they are height adjustable by simply rotating the head and each can support up to 600 lbs. For pipes, struts, pavers — KnuckleHead supports are engineered to last the life of the roof — and they are economical.

Visit us at **greenlinkengineering.com** for details

GREEN LINK
ECO-ENGINEERING

888.672.9897

WRITTEN BY **LOUISA HART**



A fully-adhered membrane will prevent fluttering and minimize energy loss.

Energy-Saving Installations

Developing Roof Systems That Prevent Energy Loss

SEVERAL MILLENNIA ago, early man — and the wife and kids — decided that life in a cave was a little dark, damp and confining, and started thinking about a better place to live. This led, eventually, to the need for a roof. Sod was the obvious first choice for a roofing material — abundant supply, close at hand, pretty simple to install, providing good insulation — but not very waterproof and very prone to catching fire in dry weather. Whether that caveman knew he had installed the first "green roof" is unknown.

Fast-forward to the multiple choices that we now have to shelter ourselves and the structures where we work, learn, shop and perform hundreds of other activities. In some ways, the challenges are the same as they were thousands of years ago: keep the occupants dry and comfortable and protect the systems in the building, although those systems are vastly more complex than they were for our ancestor emerging from his cave. A few other things have changed, as well, including the cost of energy for heating, cooling and running building systems. The challenge today is still to keep a building and its occupants protected from the outside elements. But an equally important challenge, given rising energy costs, is to keep energy expenses from literally going through the roof.

Roofing contractors are meeting this challenge by paying increased attention to places in a roofing system that might allow penetration of air, either escaping from the inside or penetrating from the outside. To get an update on state-of-the art thinking, we talked to one of the most knowledge people who study this problem.

André Desjarlais is the Program Manager of the Building Envelopes Research Program at Oak Ridge National Laboratory. He has spent the majority of his professional career "developing novel building envelope technologies and assessing their market viability." Much of his recent focus has been on developing systems that will prevent energy loss. Roof color has been extensively discussed related to energy use, with general agreement that reflective roofs save energy in warm to hot climates, and dark membranes are the most economical choice in cool to cold climates. However, there are a broad variety of other factors that influence the efficiency of a roofing system.

For instance, referring to low-slope roofing, Desjarlais points out that adequate insulation, defined by recent building codes, is essential to ensure an effective roofing system. "If we are in a jurisdiction that has adopted the most recent versions of the energy code, IECC 2015, we've really done a good job of increasing our insulation levels. Hooray for us — we have

PHOTOS: HUTCHINSON DESIGN GROUP

WESTERN Roofing EXPO

REGISTRATION SPONSORS

GAF
ABC Supply Co. inc.
JM Johns Manville
Western Roofing Insulation and Siding
Cleasby
Polyglass
Allana Buick & Bers
M2C
M3 Safety
Carlisle
Duro-Last
Roofing Contractor
APOC
IB Roof Systems
Beacon
Malarkey Roofing Products
Eagle Roofing Products
Derbigum
Roofers Coffee Shop
CertainTeed

JUNE 9-11, 2019
PARIS LAS VEGAS

REGISTER ONLINE ➡ WESTERNROOFINGEXPO.COM

WESTERN Roofing EXPO

Download on the App Store

GET IT ON Google Play

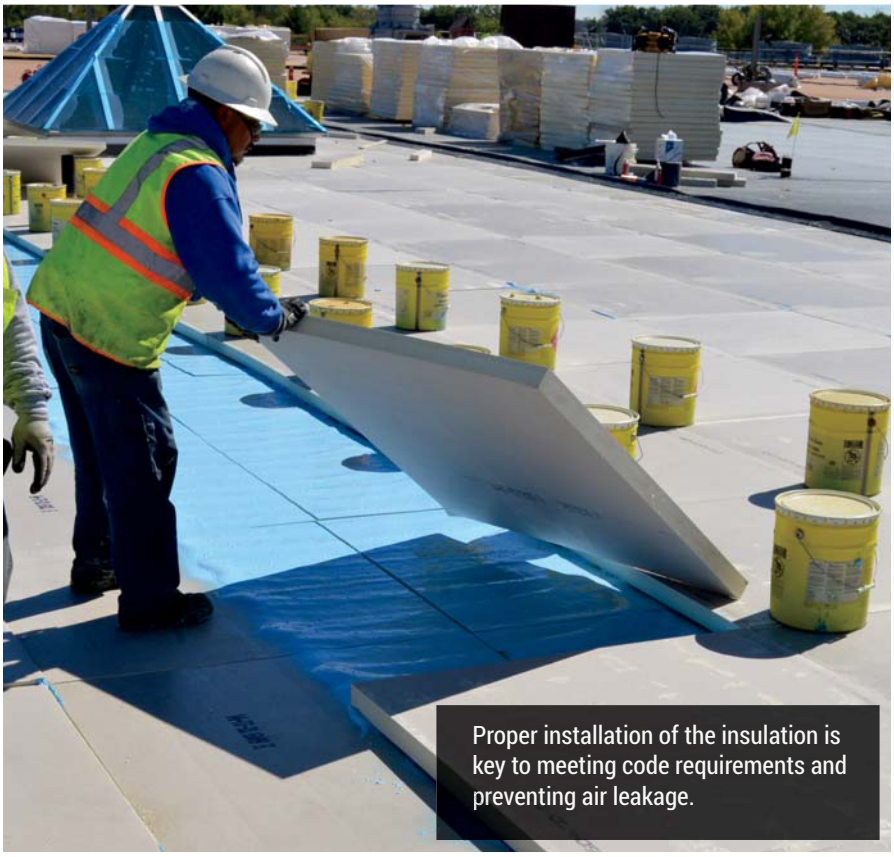
finally acknowledged that energy is important and we are mandating reasonable amounts of insulation to be put in commercial roofing." Experts also note that it is important to install insulation in multiple layers and stagger the insulation joint. Studies have shown that up to 10 percent of the insulation's R-Value is lost due to joints in the insulation.

Assuming the roof color is appropriate to the specific climate where it is being used, and insulation levels meet the latest codes, then other potential energy losses, specifically air flow or air leakage, become important. Desjarlais says the connection between the membrane and the perimeter of the building requires special attention. "How do we attach the membrane to the perimeter of the building and how do we make that connection continuous with the air barrier system of the walls?" Desjarlais says it is critical to avoid creating a path or paths for air to flow around the membrane and into the perimeter. "We need to have a continuous air barrier system, so the issue is how do you connect the wall and the roof system together?" He points out that this task can be most challenging during a retrofit to replace the roof since the parameters of the job may not include repair on the adjacent walls. Nonetheless, the connection still needs to be made securely.

"We need to have a continuous air barrier system, so the issue is how do you connect the wall and the roof system together?"

— André Desjarlais, Oak Ridge National Laboratory

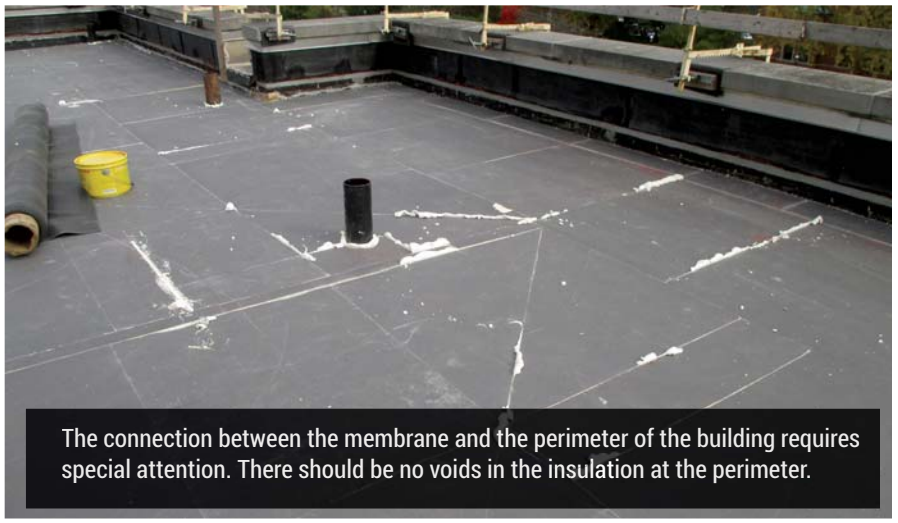
Insulation should be installed in multiple layers with the joints staggered.



Proper installation of the insulation is key to meeting code requirements and preventing air leakage.

It's also important, Desjarlais continues, to note that there are several ways for air to either penetrate or escape from a building. "Air leakage" refers to air that starts on one side of the roof and gets to the other side, so it can start from the inside of the building and work its way outdoors, or start from the outside of the building and work its way in. Either way, there is energy loss.

Another kind of energy loss is "air intrusion." This occurs when air that starts inside the building works its way through the roofing system but doesn't make it to the outside, instead looping back to the interior. This is likely to be a problem when single-ply membranes are mechanically attached. When wind flows over the surface of the roof and the membrane billows slightly, it creates a void, and that void needs to be filled. The air that fills the void is coming from the interior of the building. So as the roof flutters, it is pumping air into and out



The connection between the membrane and the perimeter of the building requires special attention. There should be no voids in the insulation at the perimeter.

of the roofing system. The air can also be carrying moisture that can condense under the roofing membrane.

If you are in a cold climate, the warm air from the interior of the building is chilled by its contact with the cold roofing membrane; if it is summer, the air becomes warmer. Either way, the air needs to be reconditioned when it returns to the interior of the building, driving up energy costs. [For a video showing the impact of "fluttering" on a roofing system, and the preferred alternative of a fully adhered system, go to http://epdmroofs.org/epdm-todays-choice/installation-methods]

If fluttering is a potential problem, Desjarlais says, some kind of control should be put on the interior side of the roof, to make it hard for the air to flow to the underside of the membrane. This also extends the service life of the roof, preventing the wear and tear on the roofing membrane that can occur with fluttering.

There's no doubt that creating an energy-efficient roofing system demands an investment in time and resources. But some currently available roofing membranes are setting new records for durability: EPDM, for instance, if properly maintained and installed, is projected to last up to 40 years. A well-designed, well-installed roofing system that prevents energy loss over four decades could provide invaluable protection against rising energy costs and a volatile energy market. R

ABOUT THE AUTHOR: *Louisa Hart is the director of communications for the Washington-based EPDM Roofing Association (ERA). For more information, visit www.epdmroofs.org.*

WRITTEN BY **THOMAS W. HUTCHINSON, AIA, FRCI, RRC, CSI, RRP**

Designing Thermally Efficient Roof Systems

"ENERGY EFFICIENCY," "energy conservation," and "reduction of energy use" are terms that are often used interchangeably, but do they mean the same thing? Let's look at some definitions courtesy of Messrs. Merriam and Webster, along with my interpretation and comment:

· **ENERGY EFFICIENCY:** Preventing the wasteful use of a particular resource. (Funny thing, though — when you type in "energy efficiency" in search engines, you sometimes get the definition for "energy conservation."

· **ENERGY CONSERVATION:** The total energy of an isolated system remains constant irrespective of whatever internal changes may take place, with energy disappearing in one form reappearing in another. (Think internal condensation due to air leaking, reducing thermal R-value of the system.)

· **REDUCTION:** The action of making a specific item (in this case energy use) smaller or less in amount. (Think cost savings.)

· **CONSERVATION:** Prevention of the wasteful use of a resource.

So, looking at this article's title, what does "designing a thermally efficient roof system" imply?

I conducted an informal survey of architects, building managers, roof consultants and building owners in Chicago, and they revealed that the goals of a thermally efficient roof system include:

- Ensuring energy efficiency, thus preventing the wasteful use of energy.
- Reducing energy use, thus conserving a resource.
- Being energy conservative so that outside forces do not reduce the energy-saving capabilities of the roof system.

Photo 1 Designing and installing thermal insulation in two layers with offset and staggered joints prevents vertical heat loss through the insulation butt joints.

IMAGES: HUTCHINSON DESIGN GROUP LTD.

Unfortunately, I would hazard a guess and say that most new roof systems being designed do not achieve energy conservation.

Why is this important? The past decade has seen the world building committee strive to ensure the energy efficiency of our built environment.

A building's roof is often the most effective part of the envelope in conserving energy. The roof system, if designed properly, can mitigate energy loss or gain and allow the building's mechanical systems to function properly for occupant comfort.

Energy conservation is increasingly being viewed as an important performance objective for governmental, educational, commercial and industrial construction. Interest in the conservation of energy is high and is being actively discussed at all levels of the building industry, including federal and local governments; bodies that govern codes and standards; and trade organizations.

As with many systems, it is the details that are the difference between success and failure on the roof. This article will be based on the author's 35 years of roof system design and in-field empirical experience and will review key design elements in the detailing of energy-conserving roof systems. Best design and detail practices for roofing to achieve energy conservation will be delineated, in-field examples reviewed and details provided.

ADVOCACY FOR IMPROVEMENT

In the past decade, American codes and standard associations have increased the required thermal values every updating cycle. They have realized the importance of energy conservation and the value of an effective thermal layer at the roof plane. They have done this by prescribing thermal R-values by various climatic zones defined by the American Society of Heating and Air-Conditioning Engineers, now better known by its acronym ASHRAE. Additionally, two layers of insulation with offset joints are now prescribed in the IECC (International Energy Conservation Code). Furthermore, the American Institute of Architects (AIA) has also realized the importance of conserving energy and defined an energy conservation goal called the 2030 Challenge, in which they challenge architects, owners and builders to achieve "zero energy" consuming buildings by 2030.

Compromises in the thermal layer will affect the performance of the insulation and decrease energy savings for years to come. Attention to installation methods and detailing transitions at roof edges, penetrations, walls and drains needs to be given in order to optimize the energy conservation potential of the roof system.

These codes, standards and laudable goals have gone a long way to improving energy conservation, but they are short on the details that are needed to achieve the vision.

ENERGY CONSERVATION IS MORE THAN INSULATION

Roofs are systems and act as a whole. Thus, a holistic view of the system needs to be undertaken to achieve a greater good. Roof system parameters such as the following need to be considered:

- Air and/or vapor barriers and their transitions at walls, penetrations and various roof edges.
- Multiple layers of insulation with offset joints.
- Preventing open voids in the thermal layers at perimeters and penetrations.
- Protection of the thermal layer from physical damage above and warm moist air from below.

Air intrusion into the roof system from the interior can have extremely detrimental consequences. In fact, Oak Ridge National Laboratory research has found that air leakage is the most important aspect in reducing energy consumption. Interior air is most often conditioned, and when it moves into a roof system, especially in the northern two-thirds of the country where the potential for condensation exists, the results can include wet insulation, deteriorating insulation facers, mold growth and rendering the roof system vulnerable to wind uplift. Preventing air intrusion into the roof system from the interior of the building needs to be considered in the design when energy efficiency is a goal. Thus, vapor retarders should be considered for many reasons, as they add quality and resiliency to the roof system (refer to my September/October 2014 *Roofing* article, "Vapor Retarders: You Must Prevent Air and Vapor Transport from a Building's Interior into the Roof System"). The transition of the roof vapor/air barrier and the wall air barrier should be detailed and the contractors responsible for sealing and terminations noted on the details.

One layer of insulation results in joints that are often open or could open over time, allowing heat to move from the interior to the exterior — a thermal short. Energy high to energy low is a law of physics that can be severe. Thus, the International Code Council now prescribes two layers of insulation with offset joints. *(See Photo 1.)*

When rigid insulation is cut to conform around penetrations, roof edges and rooftop items, the cuts in the insulation are often rough. This results in voids, often from the top surface of the roof down to the roof deck. With the penetration at the roof deck also being rough, heat loss can be substantial.

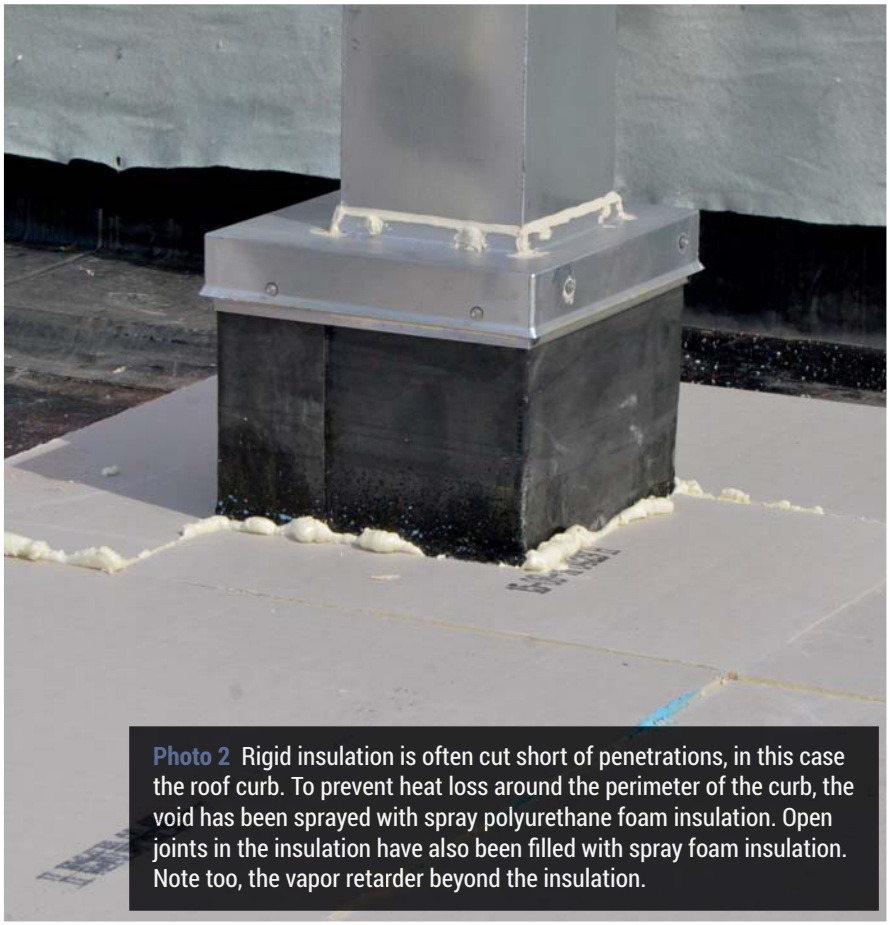


Photo 2 Rigid insulation is often cut short of penetrations, in this case the roof curb. To prevent heat loss around the perimeter of the curb, the void has been sprayed with spray polyurethane foam insulation. Open joints in the insulation have also been filled with spray foam insulation. Note too, the vapor retarder beyond the insulation.

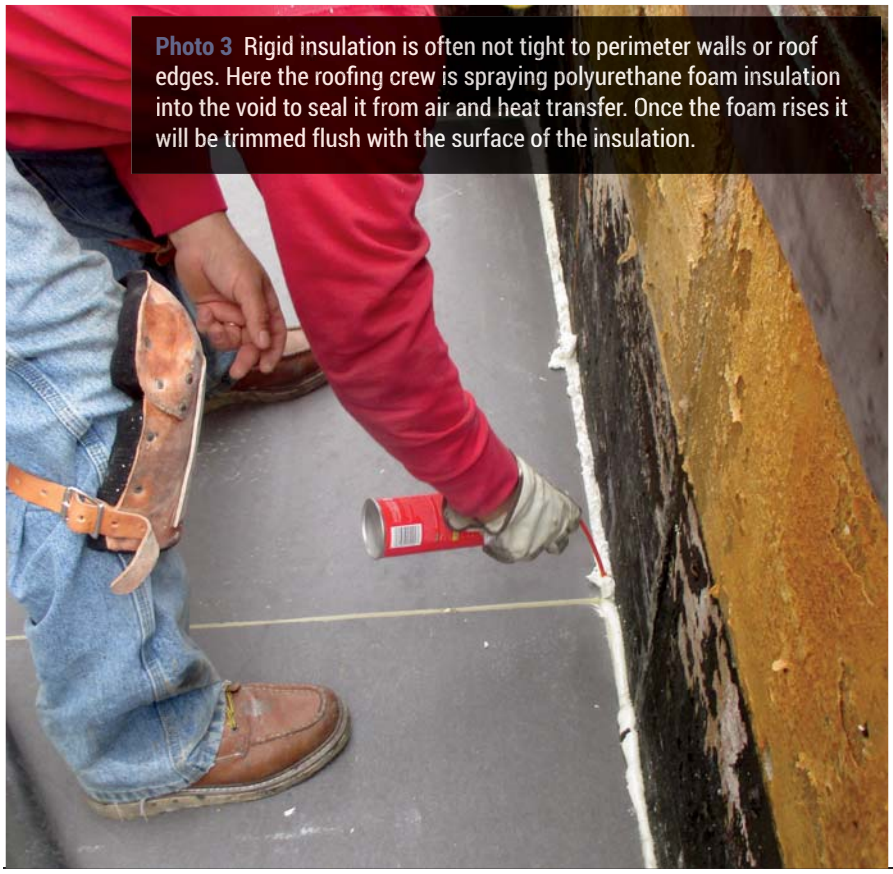


Photo 3 Rigid insulation is often not tight to perimeter walls or roof edges. Here the roofing crew is spraying polyurethane foam insulation into the void to seal it from air and heat transfer. Once the foam rises it will be trimmed flush with the surface of the insulation.

Thus, we specify and require that these gaps be filled with spray foam insulation. *(See Photos 2 and 3.)*

INSULATION MATERIAL CHARACTERISTICS AND ENERGY CONSERVATION

In addition to the system components' influence on energy loss, the insulation material characteristics should also be considered. The main insulation type in the United States is polyisocyanurate. Specifiers need to know the various material characteristics in order to specify the correct material. Characteristics to consider are:

- Density: 18, 20, 22 or 25 psi; nominal or minimum.
- Facer type: Fiber reinforced paper or coated fiberglass.
- Dimensional stability: Will the material change with influences from moisture, heat or foot traffic.
- Thermal R-value.

In Europe, a popular insulation is mineral wool, which is high in fire resistance, but as with polyisocyanurate, knowledge of physical characteristic is required:

- Density: If you don't specify the density of the insulation board, you get 18 psi nominal. Options include 18, 20 and 25 psi; the higher number is more dimensionally stable. We specify 25 psi minimum.
- Protection required: Cover board or integral cover board.
- Thermal R-value.

PROTECTING THE THERMAL LAYER

It is not uncommon for unknowledgeable roof system designers or builders looking to reduce costs to omit or remove the cover board. The cover board, in addition to providing an enhanced surface for the roof cover adhesion, provides a protective layer on the top of the insulation, preventing physical damage to the insulation from construction activities, owner foot traffic and acts of God.

The underside of the thermal layers should be protected as well from the effects of interior building air infiltration.

An effective air barrier or vapor retarder, in which all the penetrations, terminations, transitions and material laps are detailed and sealed, performs this feat. If a fire rating is required, the use of gypsum and gypsum-based boards on roof decks such as steel, wood, cementitious wood fiber can help achieve the rating required.

INSULATION ATTACHMENT AND ENERGY EFFICIENCY

The method in which the insulation is attached to the roof deck can influence the energy-saving potential of the roof system in a major way. This fact is just not acknowledged, as I see some mechanically attached systems being described as energy efficient when they are far from it. Attaching the insulation with asphalt and/or full cover spray polyurethane adhesive can – when properly installed – provide a nearly monolithic thermal layer from roof deck to roof membrane as intended by the codes.

Another very popular method of attaching insulation to the roof deck and each other is the use of bead polyurethane foam adhesive. The beads are typically applied at 6 inches (15.24 cm), 8 inches (20.32 cm), 9 inches (22.86 cm) or 12 inches (30.48 cm).

The insulation needs to be compressed into the beads and weighted to ensure the board does not rise up off the foam. Even when well compressed and installed, there will be a ±3/16-inch void between the compressed beads, as full compression of the adhesive is not possible. This void allows air transport, which can be very detrimental if the air is laden with moisture in cold regions. The linear void below the insulation also interrupts the vertical thermal insulation section.

The most detrimental method of insulation attachment in regard to energy loss is when the insulation is mechanically fastened with the fasteners below the roof cover. Thermal bridging takes place from the conditioned interior to the exterior along the steel fastener. This can readily be observed on roofs with heavy frost and light snowfall, as the metal stress plates below the roof cover transfer heat from the interior to the membrane, which in turn melts the frost or snow above. *(See Photo 4.)*

The thermal values of roofs are compromised even more when a mechanically attached roof cover is installed. The volume of mechanical fasteners increases, as does the heat loss, which is not insignificant. Singh, Gulati, Srinivasan, and Bhandari in their study "Three-Dimensional Heat Transfer Analysis of Metal Fasteners in Roofing Assemblies" found an effective drop in thermal value of up to 48 percent when mechanical fasteners are used to attach roof covers. *(See Photo 5)*. This research would suggest that for these types of roof systems, in order to meet the code-required effective

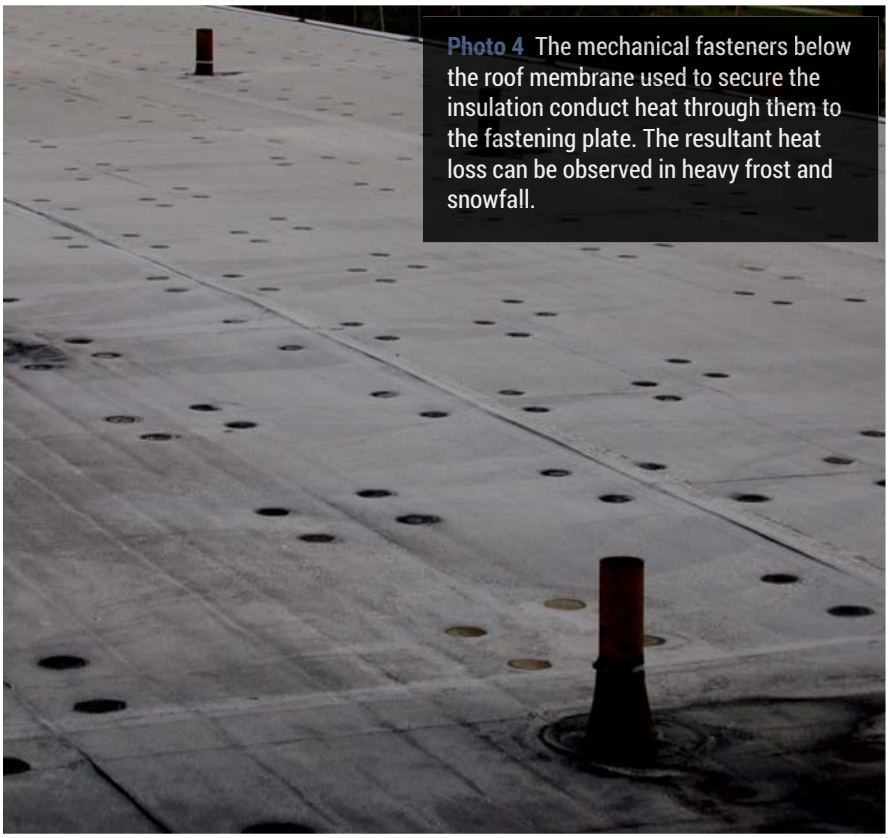
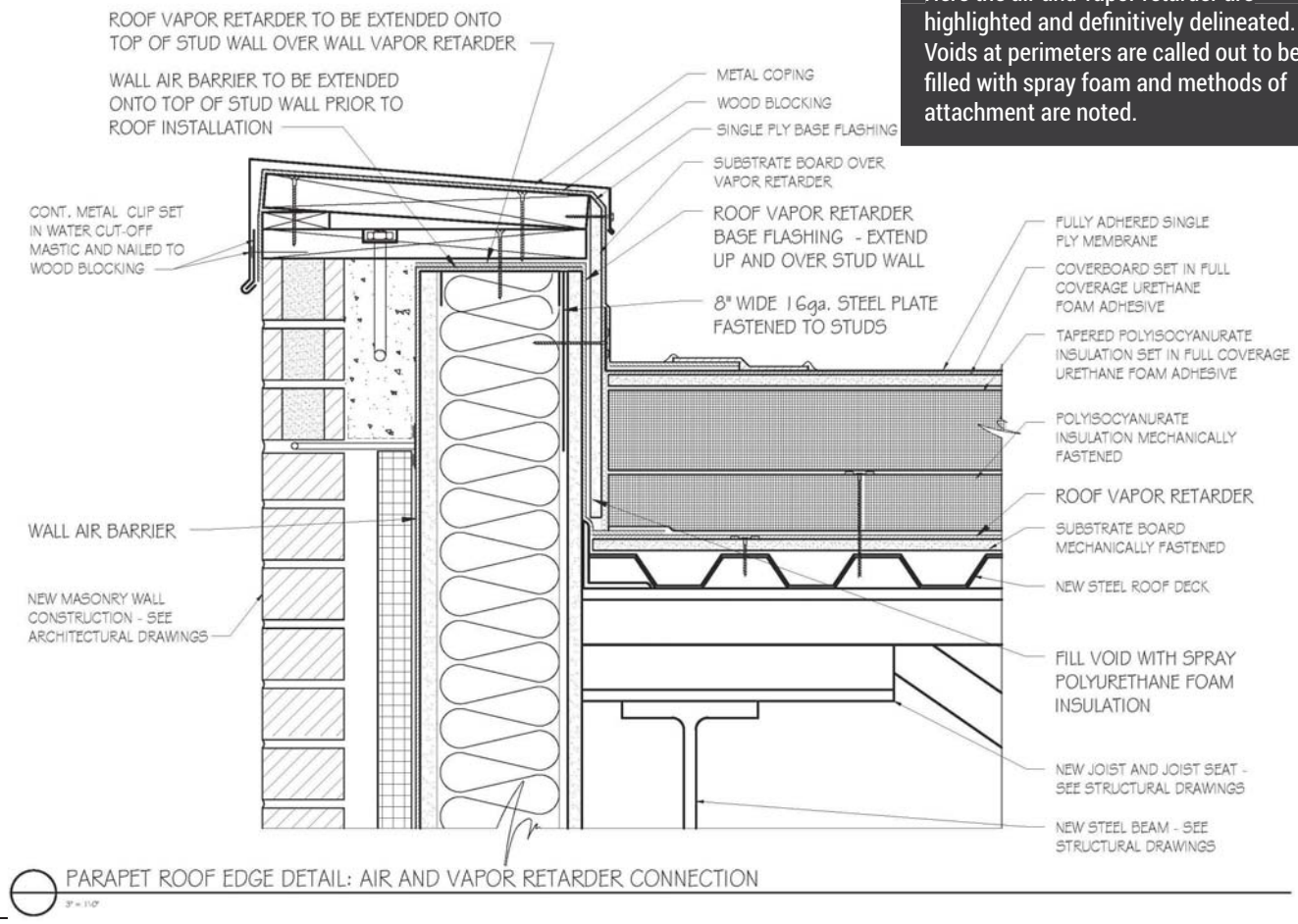


Photo 4 The mechanical fasteners below the roof membrane used to secure the insulation conduct heat through them to the fastening plate. The resultant heat loss can be observed in heavy frost and snowfall.

Photo 5 Heat loss through the insulation and the mechanical fasteners was so great that it melted the snow, which later froze again.

Figure 1 Roof details should be drawn large with all components delineated. Air and vapor retarders should be clearly shown and noted and any special instructions called out. Project-specific roof assembly details go a long way to moving toward ensuring energy conservation is achieved. Here the air and vapor retarder are highlighted and definitively delineated. Voids at perimeters are called out to be filled with spray foam and methods of attachment are noted.



thermal R-value, the designer needs to increase the required thermal R-value by 50 percent.

RECOMMENDATIONS TO INCREASE ENERGY SAVINGS

Code and standard bodies as well as governments around the world all agree that energy conservation is a laudable goal. Energy loss through the roof can be substantial, and an obvious location to focus on to prevent energy loss and thus create energy savings. The thermal layer works 24 hours a day, 7 days a week, 52 weeks a year. Compromises in the thermal layer will affect the performance of the insulation and decrease energy savings for years to come. Attention to installation methods and detailing transitions at roof edges, penetrations, walls and drains needs to be given in order to optimize the energy conservation potential of the roof system.

Based on empirical field observation of roof installations and forensic investigations, the following recommendations are made to increase the energy-saving potential of roof systems.

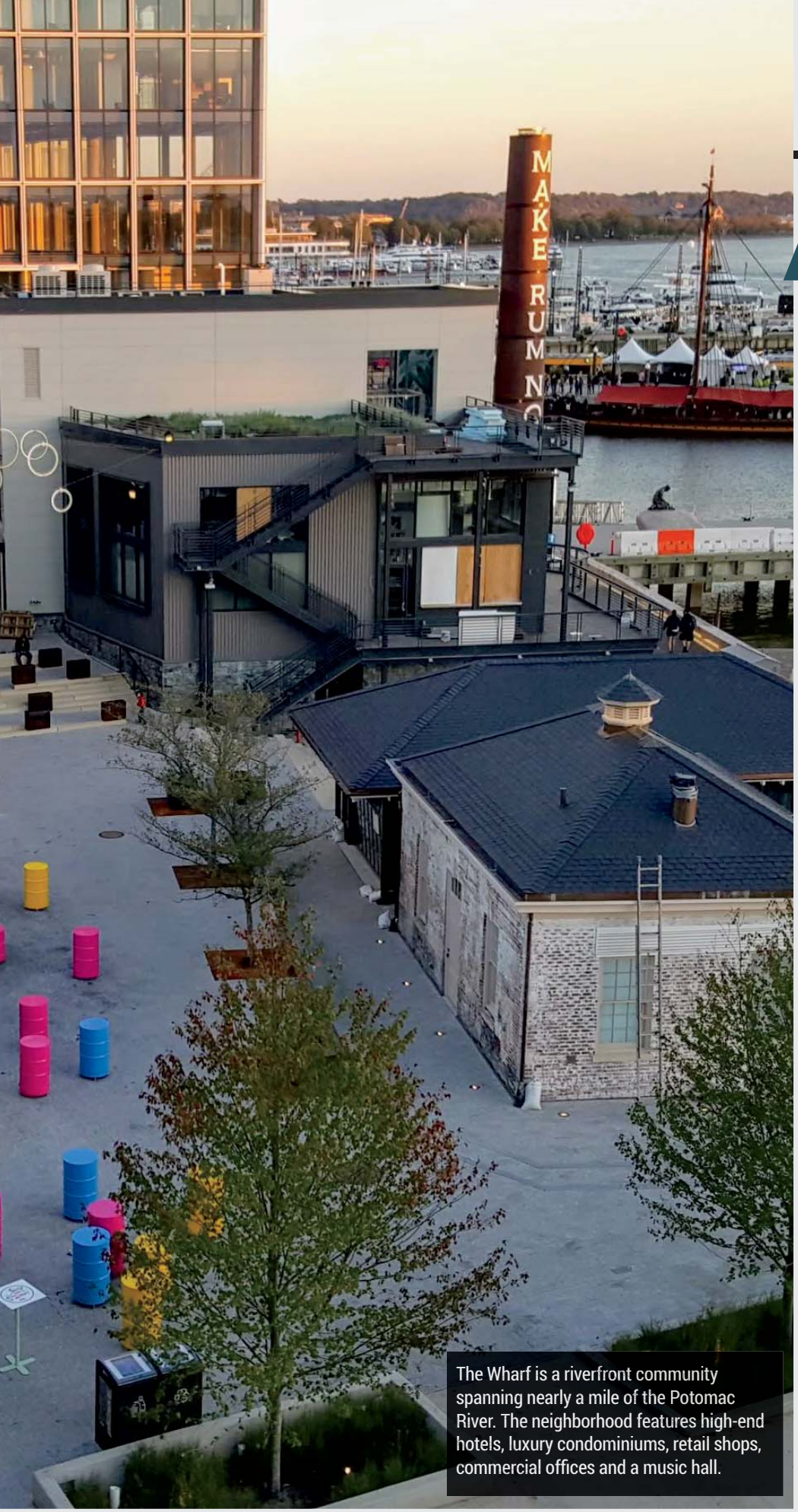
- Vapor and air barriers are often required or beneficial and should be specifically detailed at laps, penetrations, terminations and transitions to wall air barriers. *(See Figure 1.)* Call out on the drawings the contractor responsible for material termination so that this is clearly understood.
- The thermal layer (consisting of multiple layers of insulation) needs to be continuous without breaks or voids. Seal all voids at penetrations and perimeters with closed cell polyurethane sealant.
- Design insulation layers to be a minimum of two with offset joints.
- Select quality insulation materials. For polyisocyanurate, that would mean coated fiberglass facers. For mineral wool, that would mean high density.
- Attach insulation layers to the roof deck in a manner to eliminate thermal breaks. If mechanically fastening the insulation, the fasteners should be covered with another layer of insulation, cover board or both.
- Design roof covers that do not require mechanical fasteners below the membrane as an attachment method.
- Protect the thermal layer on top with cover boards and below with appropriate air and vapor barriers.

Saving limited fossil fuels and reducing carbon emissions is a worldwide goal. Designing and installing roof systems with a well thought out, detailed and executed thermal layer will move the building industry to a higher plane. Are you ready for the challenge? R

ABOUT THE AUTHOR: *Thomas W. Hutchinson, AIA, FRCI, RRC, CRP, CSI, is a principal of Hutchinson Design Group Ltd. in Barrington, Illinois. For more information, visit www.hutchinsondesigngroup.com.*

VRAs Thrive in D.C.

At The Wharf, Vegetative Roofs Play a Key Role in Storm Water Management



The Wharf is a riverfront community spanning nearly a mile of the Potomac River. The neighborhood features high-end hotels, luxury condominiums, retail shops, commercial offices and a music hall.

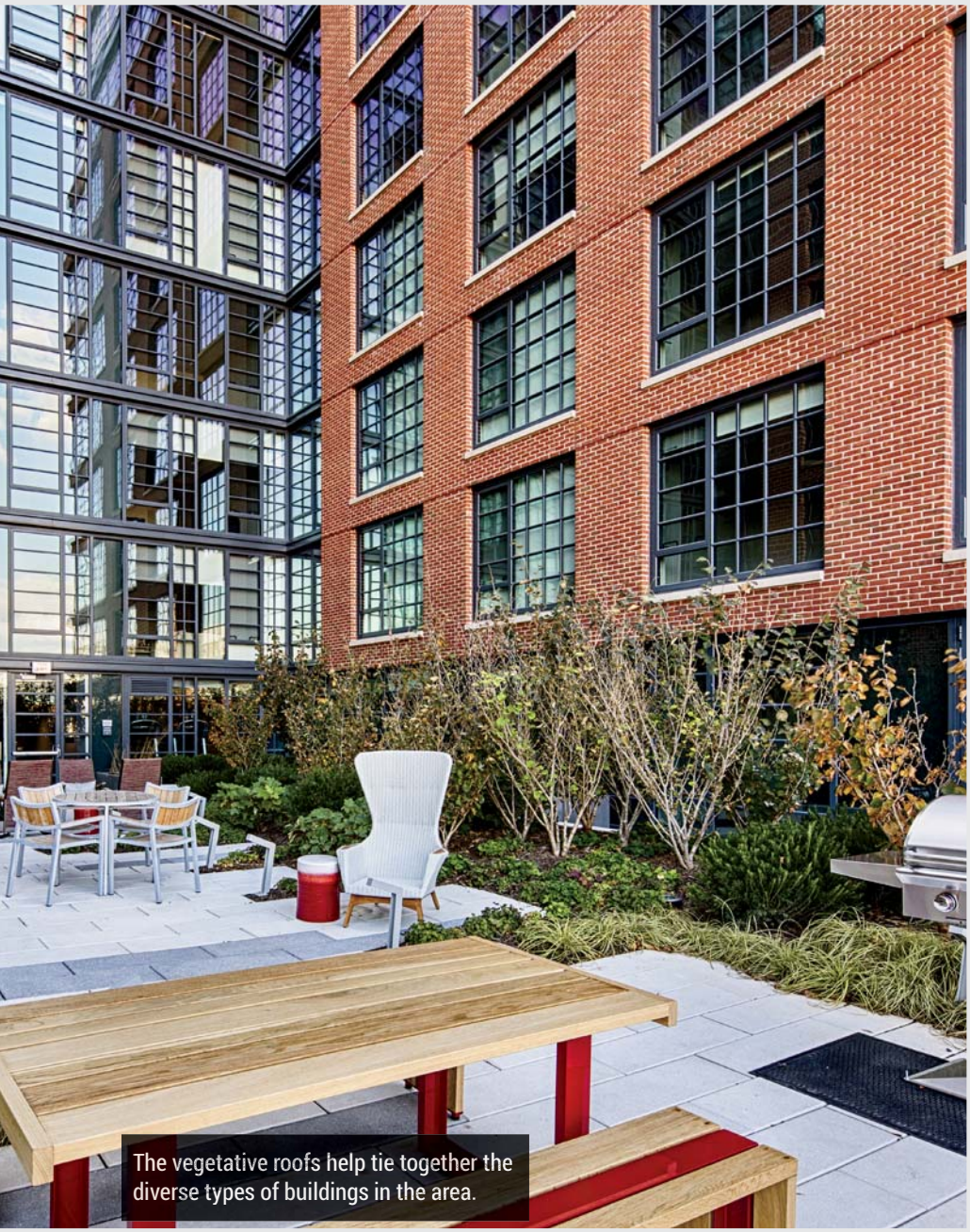
According to the Washington D.C. Department of Energy and the Environment, the District is home to more than 3 million square feet of vegetative roof assemblies (VRAs). A commitment to responsible storm water management has helped the nation's capital rank first among U.S. cities when it comes to green roofs installed. From the massive 500,000-square-foot VRA atop the Douglas Munro U.S. Coast Guard headquarters (featured in the September/October 2018 issue of *Roofing*) to elegant boutique cocktail bars, VRAs are helping Washington, D.C., manage storm water runoff and providing unique vantage points for taking in national landmarks. The Wharf, in the District's Southwest quadrant, represents a "neighborhood" approach to green roofs.

A riverfront community spanning nearly a mile of the Potomac River, The Wharf is a mixed use, public-private development, including high-end hotels, luxury condominiums, retail shops, commercial offices and even a 6,000-seat music hall. While the design and aesthetics of different buildings at The Wharf project a sense of diversity, VRAs are a unifying element. In addition to providing visual interest and elevated spaces for public gatherings, VRAs help The Wharf achieve its sustainability and water management goals.

MANAGING STORM WATER, SUPPORTING SUSTAINABILITY

Water has long been a defining element of life in the District, whose neighboring waterways include not only the Potomac, but also the Anacostia River, Rock Creek and Chesapeake Bay. To help manage storm water runoff, the District makes use of a massive cistern system, permeable pavements, and extensive use of vegetative bio-retention supported by VRAs. The District of Columbia's Department of Energy & Environment mandates measures that

PHOTOS: THE DISTRICT WHARF



The vegetative roofs help tie together the diverse types of buildings in the area.

THE WHARF
WASHINGTON, D.C.

MATERIALS

INSULATION: FOAMULAR 404 and 604 extruded polystyrene, Owens Corning, www.owenscorning.com

WATERPROOFING MEMBRANE: 790-11 Hot Rubberized Asphalt, Henry Company, www.henry.com

EXPANSION JOINTS: EMSEAL, www.emseal.com

SEDUM MATS: Sempergreen, www.sempergreen.com

PAVERS: Hanover Architectural Products, www.hanoverpavers.com

retain runoff from a 1.2-inch storm event through green infrastructure and capture reuse systems. Specific storm water retention rates are specified relative to a building's footprint.

In addition to helping manage storm water runoff, protected roof membrane assembly (PRMA) systems at The Wharf also help to support the development's sustainability performance goals, which started at the master planning stage. Sustainability objectives supported by The Wharf's VRAs include reducing storm water discharge and improving thermal performance through the cooling and shading properties of soils and plantings — an important consideration in a region renowned for its humid summers. VRAs are also desirable in urban areas for the role vegetation can play in helping filter pollution and providing habitats for birds and other wildlife. Finally, VRAs offer an aesthetically pleasing environment for employees, occupants and visitors.

The Wharf development was designed to achieve LEED Gold, while individual buildings targeted LEED Gold or Silver. Constructed in phases, Phase One opened in 2017 and took nearly 15 years to complete. While the Great Recession slowed construction, an "upside" of the delay was that a proliferation of PRMA assemblies across the District helped inform the assembly of green roofs at The Wharf. Several high-profile buildings that employ similar roofing systems include the MGM Casino, the National Museum of African American History and the National Archives.

A PRMA APPROACH TO SUPPORT PERFORMANCE

More than half of the roofs in The Wharf make use of an Owens Corning PRMA that includes Owens Corning FOAMULAR 404 and 604 extruded polystyrene insulation (XPS) supplied by PPSI Maryland. XPS delivers unique water resistance and strength properties that differentiate it from other insulation products and make it ideal for VRA applications. In fact, the demanding conditions on rooftops helped prompt the National Roofing Contractors Association (NRCA) recommendation to use only XPS insulation for VRA applications. The innate water resistance of XPS helps a roofing system retain its R-value and energy-saving power while retaining its compressive strength to bear a significant amount of overburden. Strength is critical in a PRMA application, as the insulation must be able to withstand the weight of vegetation, rainfall, growing media, pavers and surrounding surface materials.

At the highest levels, the rooftop plants and vegetation help serve as a giant sponge to absorb the rainwater. In a PRMA roof, insulation under the plant layer, growing media and filter/drainage layer is placed above a waterproofing layer which directs water horizontally to a series of overflow vaults. A network of massive 700,000-gallon cisterns throughout the District collect and control the release of water.

In addition to water, wind was another consideration when planning VRAs at The Wharf. Rock curbs from Hanover Architectural Products help mitigate against winds coming in off the riverfront. Other roofing materials that help The Wharf PRMAs achieve performance include waterproofing membrane 790-11 Hot Rubberized Asphalt by the Henry Company, EMSEAL expansion joints to tie together air barriers, and Hanover Architectural Products pavers and sedum mats supplied by Sempergreen.

CONTRACTOR COORDINATION AND COMMUNICATIONS ARE KEY

As a community-focused development, The Wharf celebrated its grand opening with several public events. Hometown rock band the Foo Fighters performed for a sellout crowd at the Anthem music center on October 12, 2017. The enormous task of completing multiple buildings against a very tight timeline was a challenge felt by all of the contractor trades on site, according to Brian Davis, general superintendent at James Myers, the roofing contractor charged with installing green roofs at The Wharf. The immensity of the project required careful scheduling and logistics among roofers and other trades. Teams worked throughout the night and seven days a week as Phase One approached completion.

As the countdown to the October 12 grand opening approached, construction teams followed tight schedules outlining exactly what team members would be working in what area at a particular time. The logistical demands of building nine buildings over six blocks made traffic bottlenecks an ongoing challenge throughout the project. Scheduling details had to consider not only the District's notorious rush hour traffic but also events and attractions in the area. For example, the Washington Nationals baseball team played a number of weeknight baseball games at home. Trades working on The Wharf were required to clear the streets three hours before the first pitch of each Nationals home game. While navigating event schedules and a tight construction schedule, contractors also had to maintain high levels of safety and quality.

The public event commemorating the completion of Phase One celebrated a one-of-a-kind public space winding along one of the nation's most historic riverfronts with an epic rock concert. More quietly, the completion of Phase One celebrated Washington's role as a leader in the installation of VRAs while helping the District achieve sustainability goals and comply with storm water management mandates. R

The green roof is a living ecosystem, and multiple species of sedum give it the best chance of success. The vegetative mat from ZinCo is pre-cultivated with about 12 to 16 hardy plant species.

Four Views From a 44th Floor Manhattan Green Roof

SL Green Realty Corp., the largest commercial landlord in New York City, is working with tenants across its NYC properties to achieve a 30-50 percent reduction in greenhouse gas emissions over 10 years. Green roofs are playing a role in the effort, including one 44 stories up at 1185 Avenue of the Americas.

The 1.1 million-square-foot commercial office building is owned and managed by SL Green, a leader in urban sustainability. Among the many environmental advantages of green roofs, they reduce the urban heat island effect, ease storm water runoff, filter pollutants in rainwater and remove carbon dioxide, a greenhouse gas, from the air. In addition, by lowering building cooling demand, they can cut greenhouse gas emissions associated with producing electricity.

The roof replacement project was completed in the fall of 2017, and key participants shared their perspectives on the project, including representatives of four companies:

1. SL Green, the property owner and management company
2. CANY Architecture and Engineering DPC, the construction management firm
3. Nations Roof LLC, the installer
4. ZinCo USA, the green roof system consultant and manufacturer

1. THE REALTY MANAGEMENT COMPANY

DANIEL HUSTER, SENIOR PROJECT MANAGER, SL GREEN REALTY CORP.

How did this project get started?

SL Green has an on-site team that manages 1185 Avenue of the Americas. I handle all the construction within the building and several others in our portfolio. The old (bituminous) roof was past its warranty. It had absorbed water, and we were showing signs of leaks in our mechanical room and the spaces below. We engaged CANY to put together a package to design and replace the roof system. They specified a reinforced waterproofing membrane from Kemper System America Inc. for the main roof, and we also asked CANY to bid with a green roof on top.

Green roofs are uncommon at such heights. What convinced SL Green?

When we originally put the RFP out for roofing renovation, we asked for the green roof as an alternative. After the group considered all the advantages and then saw the pricing, we made a collective decision that it was worthwhile to pursue.

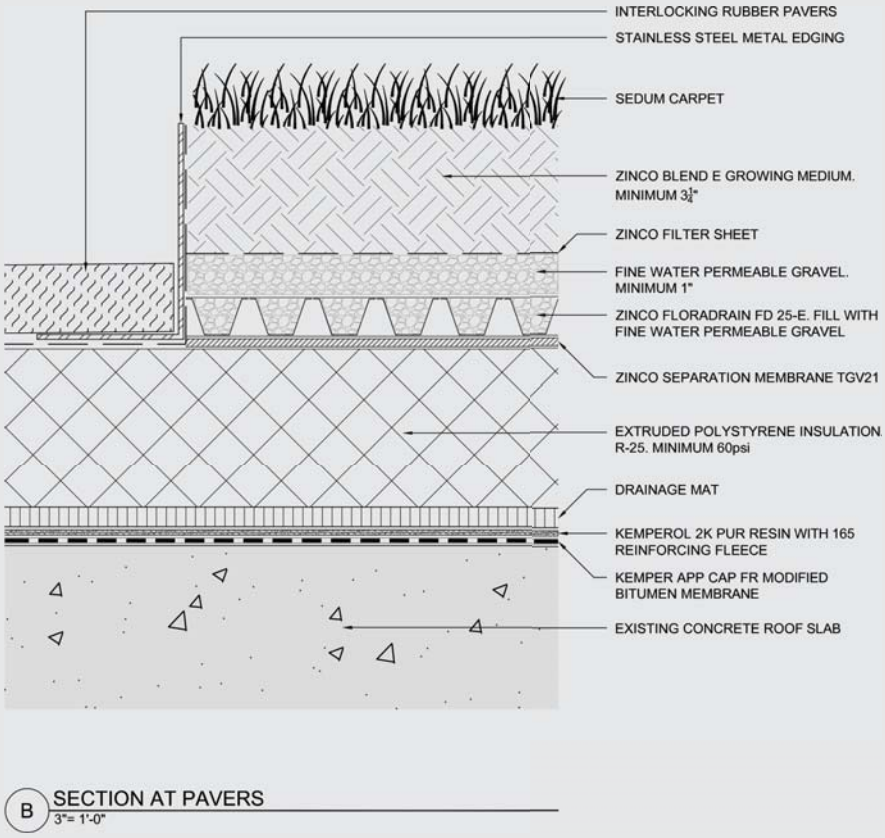
SL Green already has two buildings in New York with green roofs — 100 Park Avenue and a vegetable garden at 1515 Broadway near Times Square. But those are setback roofs at much lower elevations. The roof at 1185 is essentially rectangular, so this was an opportunity. The floor plates spread the weight, and the green roof and pavers could cover roughly 4,500 to 5,000 square feet of the 14,200 square foot total. It took a while to work out the details on the elevation, but CANY and the green roof consultant from ZinCo figured out a design that could work.

2. THE CONSTRUCTION MANAGEMENT FIRM

ANDREW CUCCINIELLO, PROJECT MANAGER, CANY

What was the condition of the existing roof?

The green roof assembly designed by ZinCo USA and CANY for the project consists of several components plus the vegetative layer. It starts directly on top of the Kemperol waterproofing membrane system beginning with a protective drainage mat. Second, on top of the rigid insulation is a drainage layer that both retains water and governs water movement through the assembly. This includes a water-retention and drainage element, Floradrain FD 25-E, with cup wells similar to an egg carton that are filled with fine permeable gravel. There is another inch of the gravel on top. Next is a filter sheet that separates the stored water from the growing media. Atop the sedum carpet, "jute netting" will protect the plants as they get established in their new environment.



B SECTION AT PAVERS
3"= 1'-0"

The existing roof was a modified bituminous system — a torch-applied sheet on the concrete deck followed by layers of rigid insulation, topped with cover board and two more plies of the mod bit. Judging by the wear, it had been down about 20 years. We completed an investigation of the assembly, and found that it had failed in a number of locations and water had infiltrated the layers. This was one of the driving forces behind our recommendation for a full replacement aside from any repair.

What is involved with the investigation?

Typical with any investigation for us, we coordinate with an environmental consultant and an independent agent, who cuts holes into the main roof frame down to the structural deck so we can understand all the existing components. This also gives us an opportunity to do material sampling and test for asbestos-containing materials (ACMs). (There were none.)

Testing lets the demolition contractor know the extent of material removal. Also, the environmental consultant is required to submit a laboratory report and must notify the NY Department of Buildings before we can file for permits. The city wants to know there are no ACMs present, and if there are, the Department of Environmental Protection will receive notification about the abatement procedures.

What do you consider in specifying the green roof waterproofing assembly?

When we get a project like this, there are several different types of materials we can consider. We try to analyze the use of the roof and what kind of traffic it will experience in terms of mechanical equipment, people performing maintenance and repairs, etc. Also, for a protective roof assembly, there can be NY Energy Conservation Code requirements for insulation.

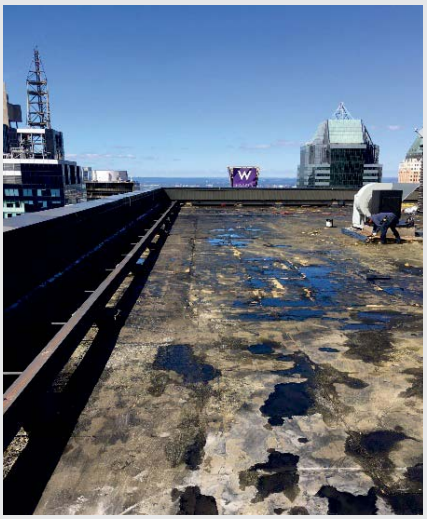
In this case, if we were to go with a built-up roof (BUR) it would require drainage at the surface, which would mean tapered insulation (likely a polyisocyanurate). Tapered insulation would drive our base flashing height halfway up the parapet, which we could not accommodate due to a scaffold track around the perimeter.

So we selected the liquid-applied Kemperol 2K-PUR reinforced membrane system, which is self-flashing and installs directly to the deck. Since it is a fully-adhered system that can withstand ponding water, we did not have to design for slope. A (non-tapered) rigid-styrene insulation board sits on top. Because the Kemperol membrane is root resistant, a separate root barrier was not required. There were also ongoing discussions with Kemper System and ZinCo throughout our design process to assist with the final overburden components.

Are inspections conducted during the construction phase?

Our company performs QC inspections throughout the course of construction. From existing roof material removal and any preparation of substrates, as well as the new roof installation, flashing details, and the overburden placement. We have been involved with Kemper System for about two decades. With these roof assemblies which offer a 20-year warranty, we conduct periodic inspections with Kemper System to make sure the installation meets their warranty compliance requirements. We

IMAGE: CANY ARCHITECTURE AND ENGINEERING DPC



Before the new Kemperol waterproofing membrane could be installed, the existing bituminous roof needed to be removed down to the concrete deck.

Nations Roof crews are acquainted with the challenges and procedures of working at height. In this photo, crew members are appropriately harnessed as they remove an old metal railing.

1185 Avenue of the Americas in New York City earned a LEED Silver rating from the U.S. Green Building Council and is one of the most efficient commercial office buildings in the nation. The property features expansive views and a green roof on the 44th floor.

were the applicant of record with the NY Department of Buildings, though, and are on board until the project gets closed out.

3. THE INSTALLER
MICHAEL JOHANNES, PRESIDENT, NATIONS ROOF-EAST

Why was Nations Roof selected for this green roof rather than an architectural landscape company?

When a realty management firm first looks at us as a roofing and waterproofing company, they see our financial stability and our commitment to working safely. Nations Roof consistently ranks in the top five roofing contractors in the U.S. We are committed to delivering comprehensive roofing solutions. During any repair or construction project, we understand the need to protect employees, guests and valuable assets, and at the same time, to maintain business operations and service levels throughout the project. This project was completed working off-hours and through occupied spaces that needed to be ready for the next workday without interruption.

Also, not a lot of landscaping companies are going to carry the required levels of insurance coverage without numerous exclusions for such things as building height. We work constantly on projects from eight to 50 stories in the air installing roofing systems both on new construction and renovations such as 1185 Avenue of the Americas.

What about the quality of the waterproofing installation?

Landscape contractors are not generally authorized to install roofing and waterproofing systems. Our foreman, project managers and installers are employees and most have been with our company for years. Our crews are trained and experienced in installing leak-free systems. That includes certified training by Kemper System in the liquid-applied reinforced membrane system used on this project. Plus, ZinCo provided guidance on installing the garden components and the transitions to the interlocking paver walkways. We can supply a "finished turnkey green-roof" with all the components, and provide the owner with a warranted watertight installation.

Has Nations Roof installed other green roofs in New York City?

TOP PHOTOS: NATIONS ROOF LLC

Actually, we've done many garden roof installations. For example, we successfully completed 100 Park Avenue with SL Green, which was a LEED Silver project, and Via Verde, an affordable housing complex in the Bronx.

New York and Chicago are at the front of the green roof trend. Via Verde was former N.Y. Mayor Michael Blomberg's first initiative into green gardens back in 2010, and they caught on. Most new roof projects we do in the city now have some form of hardscape and softscape. It's valuable space that in the past has gone unused for the owner and the tenants. If you live or work in one of these buildings, it's nice to have a place you can go that is secure. When we go to Via Verde now, we see mothers with baby strollers sitting and reading books in what would have been just a roof a few years ago.

What do you see for the future of green roofs?

We believe the market will continue to be strong for livable roof space that improves the environment, and we will continue to be in the middle of that with big developers. It is also the commitment and leadership of property owners like SL Green to invest in these initiatives that will continue to drive success.

4. GREEN ROOF SYSTEM CONSULTANT AND MANUFACTURER
NICK SMITH, NATIONAL ACCOUNT MANAGER, ZINCO USA

What are the primary issues with installing a green roof at this height?

Any green roof installed at 500 feet can invite potential problems with horticulture, erosion and exposure. Let's focus on those three: To analyze exposure, we recommend a wind study and sun/shade study, and CANY performed these tests.

Wind uplift is a major issue with the physical properties of the green roof. We are concerned with getting the proper ballast. In this situation, a standard engineered-material assembly would not be heavy enough to protect against a worst-case scenario. The solution was to add significant weight to the assembly within the cups and the drainage elements. The engineered growing media is also a bit heavier than normal.

Wind scour, a horticultural issue, is the plant's ability to stay vital with continuous wind. We know after looking at hundreds of studies that trouble spots most often occur around the perimeter and at corners, where you get microcurrents of fast-moving or swirling air. The conventional wisdom is that on a building over 500 feet tall that is going to withstand serious wind 24 hours a day, plants simply won't grow at the perimeter and corners.

To combat erosion, we separated the vegetated area from the walkway deck in many areas with an aluminum angled-edge. The aluminum barrier acts as a separation for the way the wind moves. So we make sure the installer understands that at the edge angle, the depth of the growing media must be exactly compacted in the cup wells to 3 inches plus. A shallower depth may not be significant at the center, but at the edge you must have that specificity in quality control to safeguard against erosion.

Finally, once the plants are down, we place a "jute net" over the entire assembly. Our erosion blanket is a biodegradable coco-fiber. It is really important on the perimeter that the jute net is wrapped around the vegetation and under the soil profile at full depth to make sure the plants have the best chance.

What were some other ways you adapted the green roof for this project?

One unusual thing is we infilled the drainage element with an aggregate. That's not totally uncommon on a green roof assembly, but it is on sedum. We wouldn't do that at a lesser height, but it served as ballasting. The mineral-based aggregates we use also wick the water saved in the cups up into the growing layer, which in this case had a slightly higher dry weight (28.9 pounds per square foot) than a traditional assembly, again primarily for ballasting.

Dry weight always compromises nutritional content in the media. That means you can't think strictly about weight, or you lose plant vitality. This was a balancing act we performed with CANY — to make sure proper weight was maintained for ballasting without undermining the needs for plant life, while also keeping the fully saturated weight within the load-bearing requirements of the structure.

What about the installation?

Green roof design, engineering and global experience are important, but the success of a green roof also depends on the installation. We worked with Nations Roof on proper installation technique, both generally and specifically for this challenging installation, and they did a fantastic job. R

1185 AVENUE OF THE AMERICAS NEW YORK, N.Y.

GREEN ROOF PROJECT

TEAM

BUILDING MANAGEMENT: SL Green Realty Corp., New York, www.slgreen.com

CONSTRUCTION MANAGEMENT: CANY Architecture and Engineering DPC, New York, www.cany.com

INSTALLER: Nations Roof-East, Yonkers, N. Y., www.nationsroof.com

GREEN ROOF CONSULTANT: ZinCo USA, Stoughton, Massachusetts, www.zinco-usa.com

MATERIALS

ROOF WATERPROOFING SYSTEM: Kemperol 2K-PUR cold liquid-applied reinforced membrane system, Kemper System, West Seneca, N.Y., www.kemper-system.com

GREEN ROOF: Custom Sedum System by ZinCo USA, Stoughton, Massachusetts, www.zinco-usa.com

This residence on Orcas Island is crowned with an extensive green roof from XeroFlor.

Island Oasis

Living Roof Helps Orcas Island Home Blend into the Landscape

Orcas Island is a horseshoe-shaped island in the northwest corner of the state of Washington. With an area of 57 square miles, it's the largest of the San Juan Islands, and accessible only by ferry. When a client approached him about building a custom home on the island, Justin Paulsen jumped at the chance. Paulsen is the owner of Terra Firma NW LLC, a general contractor located in nearby Eastsound, Washington. "We were hired directly by the owners to build the project from the ground up," Paulsen notes.

The 3,400-square-foot home features 3,850 square feet of roof area, which is crowned with a living roof. The system specified for the project was a XeroFlor extensive green roof, which was installed on top of a PVC membrane roof manufactured by Versico.

"The roof system works well for the home, which is designed in the style of the Bauhaus school of design," notes Paulsen. "The home features many linear design elements, and the green roof gives it a sense of blending in with the natural surroundings."

It was only the second green roof Paulsen had been involved with, so he made sure to do his homework. He knew from experience that work on the island would pose logistical challenges, so he tapped a talented to team to help design and execute the project.

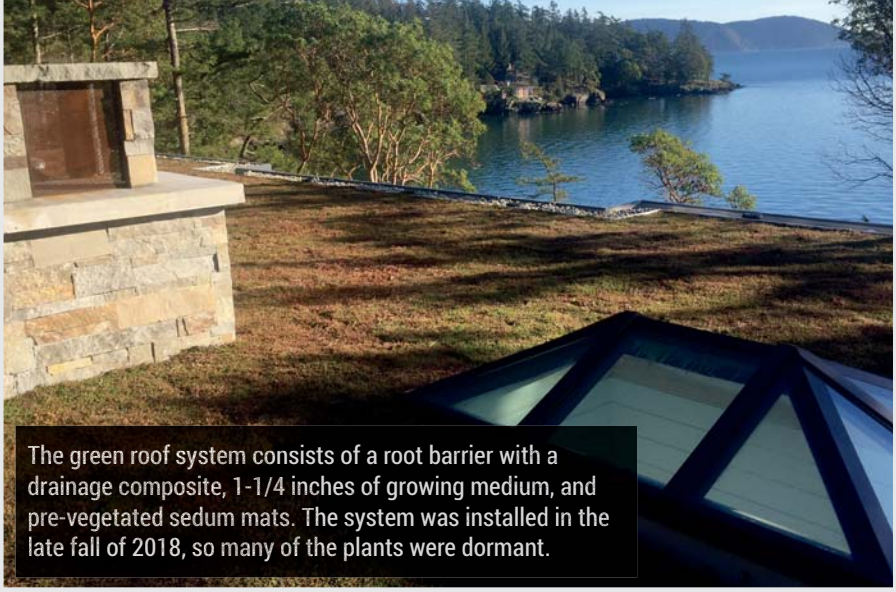
THE ROOFING CONTRACTOR

Paulsen wanted a skilled roofing contractor to install the waterproof layer beneath the green roof system. The Versico rep in the area, Ken Stillwell, recommended All Weather Rooftop Solutions, headquartered in Everett, Washington. The company, owned by partners Todd Severson and Greg O'Neill, typically focuses on commercial work, but this project was right in their wheelhouse. Severson knew the company had to plan ahead to ensure the everything went smoothly.

"Working on the island was the biggest challenge of the whole project," Severson notes. "We wanted to complete the project in one week, so we had to make sure we had everything ready to go. Everything had to be transported by ferry, so we had to schedule all of the trucks and make sure all of the material landed at one time. We just had to make sure we had all of the material and manpower on that ferry."

The PVC roof system was installed over a plywood deck. Crews first installed two layers of 3.3-inch insulation

PHOTOS: TERRA FIRMA NW LLC



The green roof system consists of a root barrier with a drainage composite, 1-1/4 inches of growing medium, and pre-vegetated sedum mats. The system was installed in the late fall of 2018, so many of the plants were dormant.

to achieve an R-value of 38. Tapered insulation system was then added to ensure proper drainage. The insulation was topped with half-inch DensDeck Prime cover board, which was mechanically attached. A gray 60-mil PVC membrane from Versico was then fully adhered over the entire assembly.

All Weather crews also installed OMG SpeedTite roof drains with Vortex-breaker technology, as well as Solatube light tubes. The large skylight was installed by the manufacturer, CrystaLite.

The sheet metal work was completed by All Weather on a second trip, with a smaller crew returning to complete the flashing and edge metal. The roofing portion of the project went smoothly. "Justin from Terra Firma was great work with, and our superintendent, Jeff Gale, did a great job quarterbacking it on our end," Severson notes. "Everything went off without a hitch. It's a pretty unique little structure."

Paulsen agrees. "They did a great job installing the insulation and the membrane," he notes. "The biggest thing we had to deal with after that was protecting the membrane from other trades. Our stonemason had to go back up on the roof and complete the chimneys."

To preserve the integrity of the membrane after it was installed, Terra Firma crews cut a 20-mil pond liner pond liner into sections that were used to protect areas of the roof that had to be accessed by other trades.

INSTALLING THE GREEN ROOF SYSTEM

After all the other work was completed on the rooftop, crews from Terra Firma installed the green roof system in the late fall of 2018. He had heard about XeroFlor from another contractor and did some research. Paulsen then contacted Clayton Rugh, director of XeroFlor America, to design and specify the system.

"I thought it was really top-notch system," Paulsen notes. "I went to Clayton to document some other examples that had been installed in the area, and I pitched it to our client. Clayton did all of the functional engineering work on the green roof system and determined the soil requirements. The plantings by XeroFlor were sourced very close to the project site, which helps to ensure successful future growth."

The extensive green roof system consists of a root barrier with a drainage composite, which is an open-flow zone of polymer coils with a bonded fleece fabric sheet. The drainage material was topped with 1-1/4 inches of growing medium, followed by 1-inch-thick pre-vegetated mats, which contained a mix of sedum succulents.

The pre-vegetated mats are installed just like sod. "They arrive rolled up on a pallet," Rugh notes. "You just align the roll adjacent to the previously installed roll, abutting it tightly, and roll it into place."

Terra Firma also installed the edge metal and rock ballast around the perimeter. "I was amazed at how simple it was to accommodate the green roof portion of the project," Paulsen says. "Once the membrane was down, we knew we were rock solid and the house was well protected. The green roof portion was easy to install. I'd definitely do one again."

Paulsen is proud to have this project under his belt. He can't wait to see it in the spring, when the green roof is in its full glory.

"Terra Firma NW thrives on jobs that have complex and unusual requirements," Paulsen says. "This job, from foundation all the way through the roof, presented numerous design challenges. We have a $2 million-dollar house under this roof. If I had to give advice to anyone doing a green roof, my advice would be: Don't cut corners." R

ORCAS ISLAND RESIDENCE ORCAS ISLAND, WASHINGTON

TEAM

ARCHITECT: Harlan Pedersen AIA, Orcas, Washington

GENERAL CONTRACTOR: Terra Firma NW LLC, Eastsound, Washington, www.tfnwllc.com

ROOFING CONTRACTOR: All Weather Rooftop Solutions, Everett, Washington, www.allweatherroof.net

MATERIALS

EXTENSIVE GREEN ROOF SYSTEM: XeroFlor XF + GM Assembly, XeroFlor North America, www.xeroflornorthamerica.com

ROOF MEMBRANE: 60-mil PVC, Versico Roofing Systems, www.versico.com

COVER BOARD: DensDeck Prime, Georgia-Pacific, www.densdeck.com

SKYLIGHT: CrystaLite, www.crystaliteinc.com

DAYLIGHTING: Solatube, www.solatube.com

ROOF DRAINS: SpeedTite roof drains, OMG Roofing Products, www.omgroofing.com

SPECIAL REPORT

WRITTEN BY **JOHN A. D'ANNUNZIO**

Fluid-Applied Membranes and Roof Restoration Methods

FLUID-APPLIED MEMBRANE systems have been available on the U.S. commercial waterproofing market for many years. Originally, the systems most frequently applied were hot-applied emulsions with or without reinforcements. In the early 2000s, a liquid rubber membrane system was developed that could be applied in cold-process fluid-applied applications. The liquid rubber material combines the elastic properties of rubber polymers with the weatherproof/waterproof characteristics of a highly refined emulsified asphalt. The resulting formulations are proprietary materials that, when properly applied, adhere to form a monolithic rubber membrane. The resulting membrane can be applied to range from 20 mils to 200 mils dry.

Unlike coatings that only provide a film surface or adhesives that require reinforcements for waterproofing capacity, the liquid rubber forms a seamless membrane that provides instant waterproofing/weatherproofing capabilities. The material cures within seconds to 80 percent of its full strength with full cure within 12 hours of application. The liquid rubber membrane is manufactured at the point of application through its dual component formulation; the system consists of a spray grade and a catalyst that are mixed together at the moment of application through specially designed spray rig equipment. The chemical reaction between the spray grade and the catalyst results in an instant, seamless rubber membrane. The instant set allows the seamless membrane to be in direct contact with water immediately. This feature also allows for the material to be applied either horizontally or vertically up to 200 mils thick in one application. Although the membrane still requires time to fully cure, it is approximately 80 percent cured when the two materials come into contact. This is a unique feature of the material, and it requires specialized equipment and training to be applied correctly.

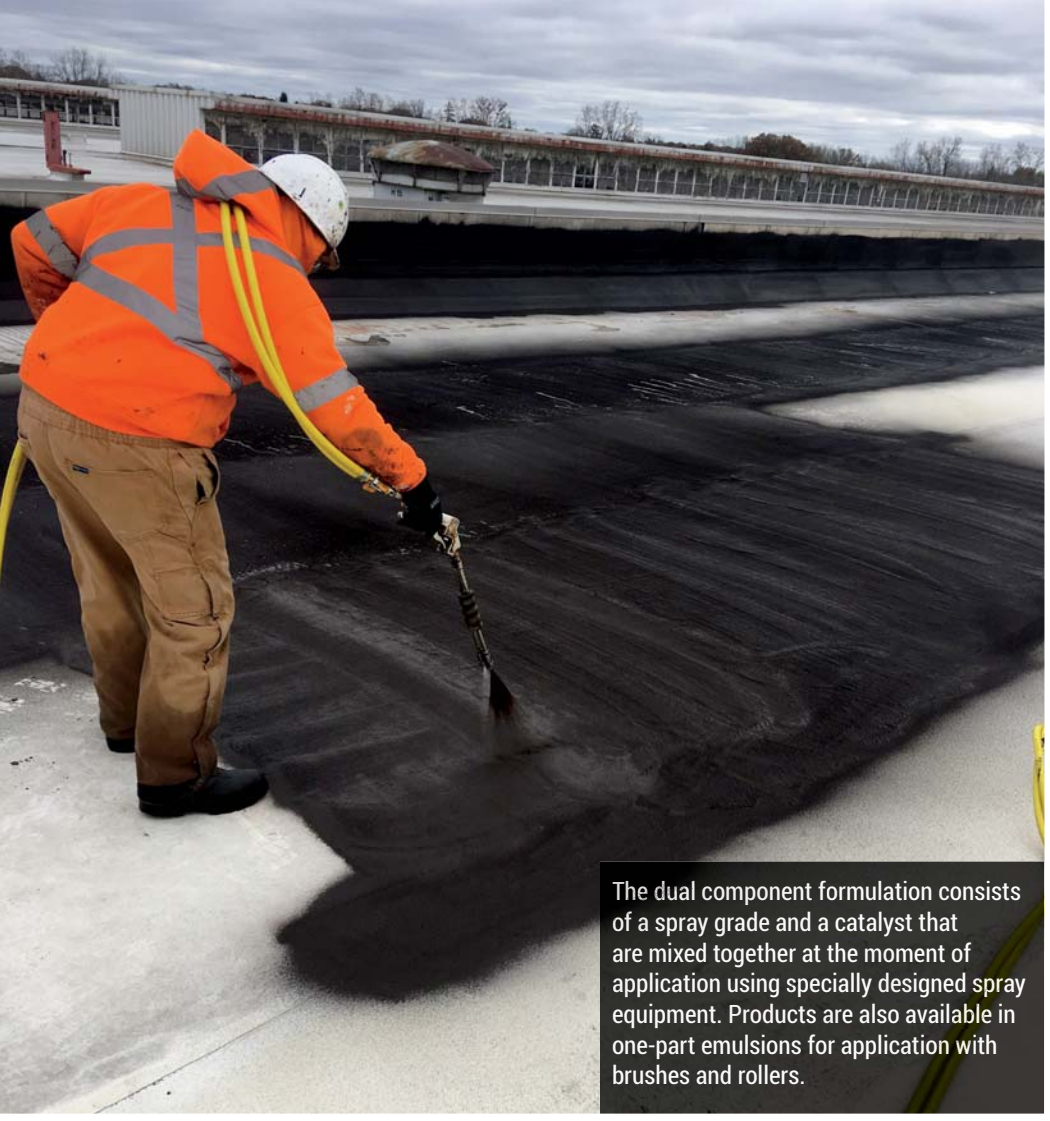
Cold-process fluid-applied systems combine the elastic properties of rubber polymers with the waterproofing characteristics of a highly refined emulsified asphalt. The result is a monolithic, seamless rubber membrane.

ADVANTAGES OF LIQUID RUBBER MEMBRANES

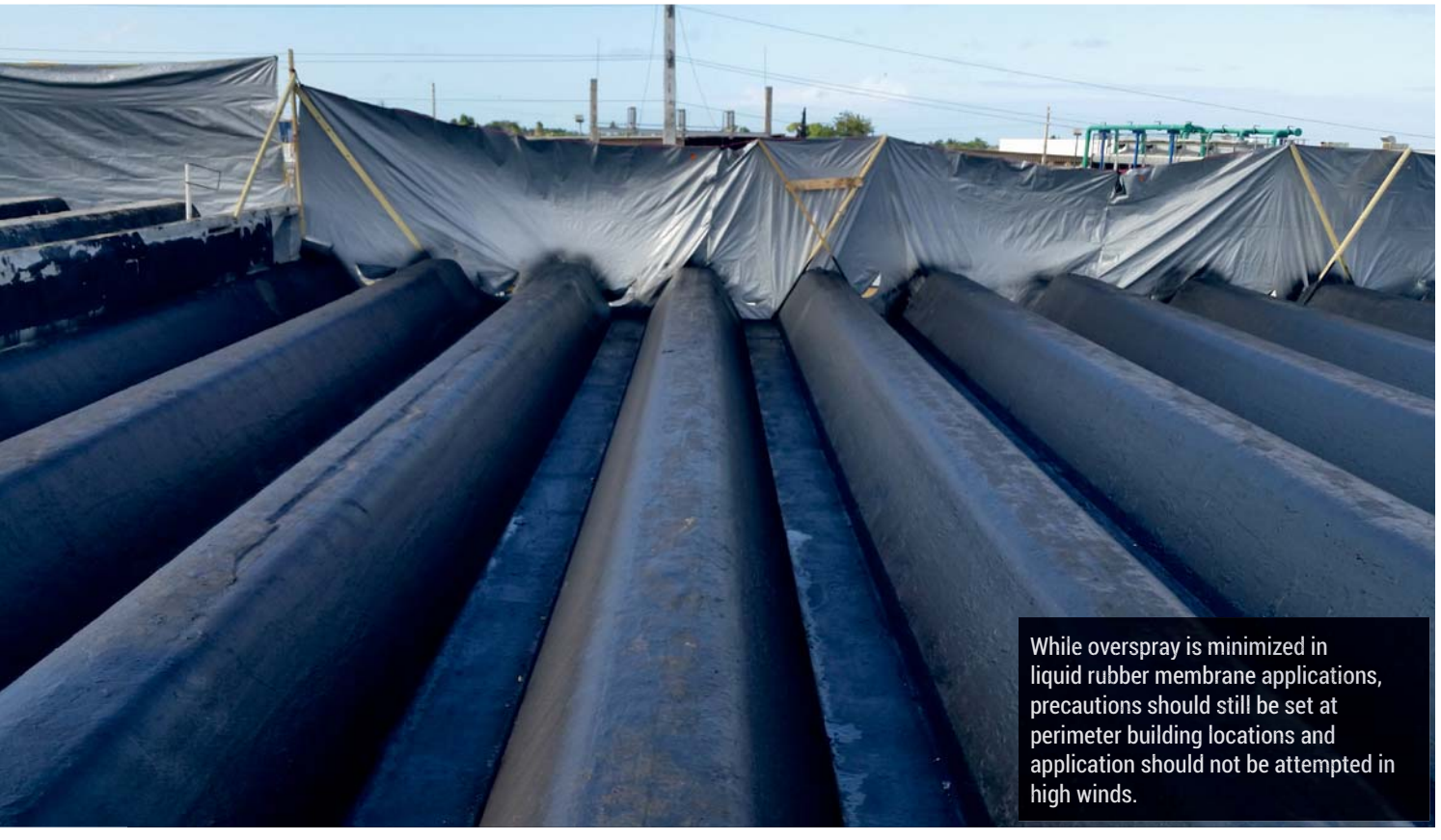
Liquid rubber membranes combine the properties of adhesives and coatings while adding significant technological advancements that create an instant-setting waterproofing/weatherproofing membrane. It is the 21st century version of a built-up roof (BUR) system that has the performance characteristics of modified bitumen and—because it is a monolithic, seamless membrane—it provides a longer service life with less maintenance than other options. Liquid rubber membranes provide economical solutions to a wide variety of roofing and waterproofing/weatherproofing applications.

Liquid rubber membranes can be applied in all types of waterproofing, roofing and exterior envelope conditions. The primary advantages of the material are as follows:

- **Superior elongation and recovery.** Structures move. Surfaces expand. Seasonal temperature changes alter the size and shape of every object. Liquid rubber membranes have the capacity to stretch and recover, which allows for movement of the underlying surface. The



The dual component formulation consists of a spray grade and a catalyst that are mixed together at the moment of application using specially designed spray equipment. Products are also available in one-part emulsions for application with brushes and rollers.



While overspray is minimized in liquid rubber membrane applications, precautions should still be set at perimeter building locations and application should not be attempted in high winds.

PHOTOS: PARAGON ROOFING TECHNOLOGY

average elongation is over 1,000 percent, and the material recovers to 90 percent of its original state after elongation.

- **Excellent adhesion.** Liquid rubber bonds to most substrates and forms a permanent bond with itself, resulting in self-healing and self-sealing properties. The liquid rubber membrane provides excellent adhesion to metal, wood, plastic, and concrete — even green concrete. It also provides strong adhesion to existing construction materials like BUR, modified bitumen, thermosets and thermoplastic membranes, and all waterproofing materials. In most cases, no primer or tack coat is required.
- **Sustainable and environmentally responsible.** The materials contain no VOCs and satisfy EPA regulations and environmental concerns. No special ventilation is required, as the material is non-toxic, odorless, and non-flammable.
- **Safe applications.** Products are available that can be applied with trowels or squeegees as well as a specially designed dual-component spray rig. No heat, kettles, torches or open flames are required in the application process. The material is safe to apply and poses no health risks to the applicators.

Another primary advantage of the liquid rubber membrane system is that the material is self-leveling. This allows the membrane to conform to substrate irregularities and provide a continuous seal at penetrations, which are typically the most difficult details in roofing applications. The instant, full adhesion of the membrane allows for continuous system application without additional components that would be required with other membrane applications. This eliminates the chances of deformation from the breakdown of different material system components. It also eliminates some of the application errors associated with multi-component systems.

Deformations of one of the materials in the multi-component system can lead to failure of the total system. Examples of typical defects in roofing systems include loss of attachment from improper adhesive application at substrate, insulation or membrane; improperly aligned insulation; loss of attachment of insulation due to substrate irregularities; voids in membrane attachment that lead to blisters and/or ridges; and slumping or buckling flashing due to improper attachment. The improper attachment of one component leads to differential movement in the system.

Liquid-applied systems form a monolithic membrane, eliminating the most vulnerable point of rolled membranes for moisture infiltration: the seams. The superior adhesion characteristics to all types of substrates and materials also

eliminates the chances of moisture infiltration under the membrane.

The elongation and flexibility of liquid rubber membrane exceeds industry standards. This allows it to withstand typical thermal cycling and perform well in extreme heat and cold. Application temperatures are wider than most other adhesives and coatings, and range from ambient outside temperatures of 20 degrees Fahrenheit to over 100 degrees. The membrane is naturally UV resistant and can be exposed throughout the lifetime of the membrane. The membrane is compatible with all types of reflective coatings if application is required. Granule surfacing can also be applied.

The membrane is also very durable. Depending on applied dry mil thickness, the membrane can withstand heavy force and is puncture resistant with self-healing and self-sealing properties.

The membrane can be applied over damp surfaces and it can be exposed to ponded water in unlimited duration. The material has been used as pond liners and in containment tanks since its introduction to the market. The water absorption rate is less than 1 percent—well below ASTM's minimum water absorption rate of waterproofing materials, which is 5 percent.

BENEFITS FOR APPLICATORS

There are significant benefits to applicators of liquid rubber membranes. The foremost benefit is the reduced crew size required for application. This is an important consideration due to the severe labor shortages affecting the construction industry.

In most cases, a crew of three properly trained and experienced applicators using one spray rig can complete up to 10,000 square feet in one day. Additional hoses and/or spray rigs can double or triple those production rates.

In addition to the advancements in material technology, there are vast improvements to the specialized equipment used in the application process. The spray equipment is now portable and can be transported to construction sites without heavy trucks and covered trailers. The spray equipment is also

lightweight and can be easily positioned on roof areas or waterproofing trenches. This equipment is housed on four-wheel carts for easy transport throughout the construction site.

The spray equipment consists of a high-volume, low-pressure system. The dual component equipment mixes the two components outside the gun to form a monolithic membrane upon impact with the substrate.

The equipment has a direct drive system to eliminate downtime associated with traditional belt drive systems. The application rate averages up to 1,000 square feet an hour for one gun. The equipment can run two guns at the same time, which increases production to 2,000 square-feet per hour. It can run up to 600 feet of hose and the material can be contained in everything from a 5-gallon pail to a 275-gallon tote. The most common container is a 55-gallon drum.

The spray guns have also improved. Advancements in manufacturing have eliminated most of the clogging issues that plagued spray guns in the past. The spray guns are lightweight and can be disassembled rapidly if material clogs occur. The older spray guns took up to an hour to take apart in the event of material clogs.

Overspray—a common problem with most spray applications—is minimized in liquid rubber membrane applications because it is a low-pressure application and the material cures instantly after release from the spray gun. Precautions, such as coverboards, should still be set at perimeter building locations and application should not be attempted in accelerated wind conditions, but the chances of excessive overspray are minimal.

LIQUID MEMBRANES AND ROOF RESTORATION

Because of their waterproofing/weatherproofing capacity, instant cure set, adhesion success with most substrates and materials, wide range of application temperatures and membrane mil thickness that can range from 20 mils to 200 mils dry, liquid rubber membranes can perform in most building exterior applications, including new and remedial roofing applications. At this time, the systems are being used primarily as roof restoration and repair products.

Typical roof restoration projects include applications over built-up roof systems (asphalt and coal-tar), thermoplastics, EPDM, sprayed polyurethane foam, metal and tile. The liquid rubber membrane systems were designed to significantly extend the service life of the existing roof system. They are also excellent for repairing flashings and penetrations. The spray equipment is small and mobile and most repairs can be completed with minimal manpower.

When it is applied by knowledgeable installers, the system is an excellent

economical choice for building owners. The initial step in the restoration process is the proper repair of the existing roof system and preparation of the surfaces. All surfaces should be free from any loose dust, debris, oil, grease or foreign material. These items should be removed prior to application by means recommended by the manufacturer. The liquid rubber membrane can be applied over damp surfaces; however, extensive ponding water should be removed prior to application.

Proper roof repairs should be completed in compliance with roofing industry standards. The one-part emulsion can be used for repairs to the existing membrane. Reinforcements should be added as required. All cracks, penetrations, existing seams, corners should be addressed using polyester fabric with roller/brush or trowel grade.

Once proper repairs and preparation are completed, the liquid applied membrane can be applied to the existing roof surface. For most roof membranes and substrates, a light rinse/power wash of the surface is all that is required. A primer is required over existing EPDM membranes.

The initial step in the restoration process is the proper repair of the existing roof system and preparation of the surfaces.

The other exception is on aggregate surfaced built-up roof systems, which require additional preparation. Removal of all loose aggregate is required. On asphalt-based BUR, the liquid applied membrane can be applied directly over the prepared surface. For coal-tar based BUR, a manufacturer-approved fabric is required due to the gassing of the coal tar. The reinforcement should be set in a 20-mil wet profile of one-part liquid rubber. The reinforcement shall be set in a full and even application so that it is fully adhered with no wrinkles, buckles or blisters. The liquid rubber membrane is then set over the reinforcement. For best application practices, the reinforcement should be set in place with a soft-bristle broom.

The application of moisture relief vents is also required on BUR systems to prevent gassing of bitumen, which could contribute to blisters. Typical applications require one vent for every 1,000 square feet. Additional vents may be used in areas with existing moisture in the system.

Once the preparation and proper

repairs have been completed, the liquid rubber membrane can be applied. Application can be completed with brush, roller or trowel in smaller application areas. Spray grade material shall be applied using specialized equipment. Apply material in a full and even application. Always apply it in strict accordance with manufacturer's recommendations and approved submittals.

Stir materials during application in accordance with manufacturer's instructions to avoid product separation. Applicators should spray the fluid component as a continuous, monolithic and seamless membrane of uniform thickness, beginning at the lowest point and terminating at the highest point. In the event the membrane is applied too thin, contact the manufacturer for recoating guidelines. Prior to application, create a grid across the roof with spray paint, allocating one drum of material per section of the grid. Perform cut-outs to check mil thickness and retain samples. Typically, three test cuts are to be taken per 1,000 square feet. In addition, continuously check wet millage by using the "T" post on a caliper mil gauge. After the liquid rubber membrane has cured, apply trowel adhesive to any visible voids. Comply with the manufacturer's recommendations for proper membrane terminations.

For horizontal applications, apply the two-part liquid rubber membrane in a single, monolithic coat to minimum 80 mils wet/60 mil dry. Repair damaged installation in accordance with manufacturer's requirements. The spray application requires a 90-degree spray angle (a golf putting motion) with the spray tip within two feet of the surface. Wider spray angles will decrease mil thickness and can cause uneven application.

Ultraviolet stabilizers are added into the material formulation so the completed liquid applied membrane does not require additional surfacing for UV protection for short term (less than ten years) exposure. Long-term exposure (and warranties) require that some sort of surfacing is applied for additional reflectivity or protection. A variety of surfacing materials, including coatings, granules, pavers and living roof applications can be applied.

Liquid-applied membranes are typically eligible for warranties from 10 to 25 years. Contact the manufacturer for warranty requirements. R

ABOUT THE AUTHOR: *John A. D'Annunzio is the owner of Paragon Roofing Technology, headquartered in Troy, Michigan. He has been involved in testing, evaluating, and designing roofing and waterproofing materials and systems for more than 30 years. For more information, visit www.paragonroofingtech.com.*

SWENSON SHEAR

EST. 1959

The SnapTablePRO

The Towable SnapTable Pro is an all-in-one panel preparation system for preparing and installing standing seam metal roofing. This tool is designed to perfect and speed-up your panel preparation process while producing factory like cuts. This complete system is made up of 3 key components: the standing seam notcher, the panel cutter, and the eave and valley hemmer. The Towable SnapTable Pro provides the highest quality notching, cutting and hemming for any commercial, industrial or residential job and is equipped to notch, cut & hem your snap lock and standing seam profiles at your eves, hips and valleys.

This is the IDEAL MACHINE for roofers that want to provide the HIGHEST QUALITY job to their customers and want to WIN the most bids. Financing options available.

PURCHASE JUST IN TIME FOR BUILDING SEASON! $15,995

Specifications

- Consistently notches, cuts & hems standing seam profiles
- Saves 40% on labor costs
- Available with or without a trailer
- Accommodates Panel: 12"-24" in width
- Notching Offset: 29"
- Cutter Maximum: 60"
- Hemmer Maximum: 60"
- Suggested Maximum Panel Thickness: 20 gauge
- Compatible with any manufactures panel profile or panel forming machine. Additional dies available for purchase to accommodate multiple profiles.

MADE IN THE USA

Swenson Shear | 4257 E. Keyes Road, Ceres, CA 95307 | 877-588-8748
https://www.swensonshear.com | sales@swensonshear.com

SPOTLIGHT

WRITTEN BY **CHRIS KING**

A Century of Service

Cole Roofing Celebrates its Centennial Anniversary

COLE ROOFING Company is celebrating its 100th birthday this year. Founded in 1919 in Baltimore, Maryland, the company currently employs more than 100 workers and focuses on commercial roofing work, with a diverse portfolio that includes single ply, built-up roofing, metal, wall panels, and renewable energy systems.

In 2012, William Robert Cole, known as Billy, took over the helm of the company from his father, William Roland Cole, known as Bill. Billy Cole represents the fourth generation of his family to run the business. As the company commemorated this milestone, Bill and Billy Cole shared their memories of the company and insights on the industry with *Roofing*.

100 YEARS OF HISTORY

Bill's grandfather, John H. Cole Sr., founded the company as John H. Cole & Sons after World War I. "My grandfather started the business in his basement making ductwork for home furnaces," Bill says.

The business expanded to include gutters and downspouts, which led to installing shingle roofing. "Near the end of World War WII, my grandfather died suddenly," Bill recalls. "All three of the older sons were off in the military. My grandmother, Mary Cole, ran the business for about two years until the war ended and the sons returned."

Two of Mary's sons, John

PHOTOS: COLE ROOFING COMPANY INC.

and Bud Cole, took over the business after the war. In the 50s, the company started installing BUR on row houses in Baltimore. In the 60s, at Bud's initiative, the company began doing commercial work. Bud bought out his brother in the mid-60s, and the commercial side of the business continued to grow as the residential side tapered off.

"In the late 70s, I saw an opportunity with the introduction of single-ply membranes," Bill says. "We shut down our residential side and trained all our steep roofers to install single-ply roofing."

Bill Cole became president of the company in 1989 and continued to build the company, expanding into metal roofing. After years of being known as Cole Roofing, the company officially changed its name from John H. Cole & Sons to Cole Roofing Company Inc. in 1998. The business has continued to diversify in the 21st century, expanding into areas including green roofs, photovoltaic systems and metal wall panels. Bill served as president until 2012, when Billy was named president; Bill remains with the company as senior vice president.

FOLLOWING IN THEIR FATHER'S FOOTSTEPS

Bill remembers being exposed to the business at an early age. "Sometimes on Saturdays when I was 10 or 12, my dad would go out and look at jobs, and sometimes he would take me with him," Bill notes. He began working summers at the company in 1971 after his sophomore year of high school, starting out as a laborer. His starting wage was $2.75 an hour. He was surprised to find out the laborer working alongside him — a college student — was making $3 an hour. "I stormed into my dad's office to ask him what the heck was going on," Bill recalls. "My dad didn't even blink. He said, 'Well, one day you'll be able to tell people you truly started at the bottom.'"

Bill worked on some of the company's high-profile projects, including Baltimore City Hall, the National Aquarium, M&T Bank Stadium and the U.S. Naval Academy. "We did almost all of the slate roofs at the Naval Academy," he notes. "Over the years, we did a tremendous amount of work down there. We don't do much slate anymore, but back in its heyday, in the late 50s and 60s, we did a lot of slate work."

Billy got his first opportunity to work for the company at age 13, when he did odd jobs including cleaning up the yard and cutting the grass. "I moved on to destroying things with fork lifts, and then when I got my driver's license, I moved on to destroying things with pickup trucks," Billy says. "Thank goodness my dad was patient."

Billy worked summers for Cole Roofing while in high school and continued to work at the company while taking night courses at nearby Towson University. He decided to follow in his father's and grandfather's footsteps, and he's found it a rewarding experience.

"I had the fortunate opportunity to learn a lot about succession planning and running a family business from my grandfather and father," Billy says. "I like what I do. Roofing fills this need for people. You're genuinely helping them when they need it the most. People do need an expert to help them at that point, when water is coming in their building and preventing them from functioning. It ranks high on their crisis level."

ADAPTING TO A CHANGING WORLD

Bill and Billy Cole believe the company has thrived by staying on the leading edge — and not the bleeding edge — of change in the industry. "We have always kept an eye toward the future," notes Bill. "We don't always want to be the first — let someone else work the bugs out — but we are never far behind."

The Coles point to three examples of key technological advancements over the years that benefitted the company: embracing single-ply membranes, the early adoption of computers, and

Cole Roofing Company is a fourth-generation family business. Billy Cole (left) is the company's president. His father, Bill Cole (right), the former president, remains with the company as senior vice president.

taking a leading role in roof-related renewable energy.

"The biggest change during my time was the introduction of single-ply membranes," Bill says. "We always treated single ply as a separate division because in our opinion the skill set was so different. Retraining our steep roofers to be single-ply roofers was a great move for the guys and the company."

While some companies abandoned built-up roofing entirely, Cole Roofing's approach kept BUR as a viable part of the company's portfolio. "Built-up roofing never went away from Cole Roofing," Bill says. "As a result of that, we were able to use our single-ply division to grow the company. We never gave up on built-up roofing. It has stood the test of time."

Bill readily admits that adding computers benefitted the business, but he was not fond of the idea at first. The company introduced computers to the accounting department, and it snowballed from there. "We fought that change like almost every other contractor I know," Bill says. "Once we got into that world, it was wonderful. Eventually they put a computer on my desk and I became the spread sheet king. For a ten-year period, it really gave us a leg up on the competition."

Under Billy's leadership, the company has focused on further upgrading its computer capabilities. Billy also spearheaded a program to focus on living roofs and renewable energy, including photovoltaics.

"Historically, I saw where my grandfather and father felt it was important that if there was a reliable, trustworthy product that got introduced into the roofing universe, we needed to be able to provide that for our customers," Billy says. "In the early 2000s, vegetative roofs started to pop up, and that made sense to us. We believed there was a way to do it that would maintain the integrity of the roof and still provide some ancillary benefits."

Aided by legislation in the Baltimore and D.C. markets promoting storm water management, the green roof market surged. "That opened our eyes to the concept of using the roof as a platform — as something other than the roof being just an umbrella for your building," Billy recalls. "Once I learned about solar and understood the economics and the return, that made me gravitate toward the idea of building small power

The demand for green roofs has surged in the Baltimore and D.C. markets, and Cole Roofing adapted to help customers meet their needs.

plants on top of people's buildings."

A CULTURE OF SAFETY

For all of the company's accomplishments, there is one that stands above the rest, according to the Coles: the development of a comprehensive safety and loss prevention program.

"Cole was a leader in introducing real safety to the roofing industry," Bill says. "It all started when I met an insurance consultant named Ben Tyler in the late 70s. He convinced me that we should be partners with our insurance companies, not adversaries. I put together a subcommittee of field employees and supervisors, and with guidance from Ben we built a comprehensive loss control program."

The subcommittee developed two manuals — a company handbook and a safety handbook — and the experience changed the company. "It was an eye-opener, but we saw results," Bill says. "We've been told by the insurance companies that we have dealt with over the years our experience mod was much lower than any other roofers that they knew."

Cole Roofing was asked to give a presentation about its loss control program at the NRCA convention in the mid 80s. "I got to know some of my competitors, and I began to share some of the stuff we were doing," Bill remembers. "People asked us to share our program with them, and we freely did that. A lot of companies are probably still running a version of the Cole Roofing safety program today."

Cole Roofing now employs a full-time loss control manager and two quality control inspectors. "We all put safety first and provide support, training, and accountability to the field team," Billy says. "The field team has a culture of brotherhood. They all look out for one another and are encouraged to hold each other accountable, regardless of rank, to be safe and follow the rules. We start with focusing on getting everyone back to their family every day; compliance is a byproduct."

FAMILY MATTERS

Since announcing the 100th anniversary, the Coles have been overwhelmed by the outpouring of support from former employees and competitors alike. Bill chalks his company's successful track record to "keeping it simple." He also points to a company culture that emphasizes a strong work ethic and a commitment to its employees.

"Somewhere along the line, my dad made it clear to me that our biggest asset in our company was its employees," Bill says. "Running a family business is not easy. We've had our trials and tribulations. I think the answer for us is that we have always treated our employees as family, which better prepares us to deal with our own family."

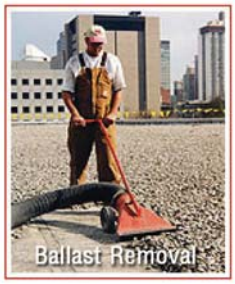
For Billy, summing up the formula for the company's success is simple: "We put our integrity first." R

AD INDEX

COMPANY	PHONE NUMBER	WEB ADDRESS	PAGE	CIRCLE NO.
Adler Roof Vac	(866) 766-3822	www.AdlerVac.com	59	45
Advanced Architectural Sheet Metal	(231) 861-0050	www.AdvArchSM.com	22	14
Atlas Roofing	(800) 388-6134	www.AtlasRoofing.com	43	38
Aztec Washer	(858) 513-4350	www.AztecWasher.com	81	56
Bilco	(800) 366-6530	www.Bilco.com	17	10
Building Products Development	(866) 766-3254	www.BPDusa.com	73	47
Chem Link	(800) 826-1681	www.Chemlink.com	19	11
Design Components	(800) 868-9910	www.DesignComponents.com	45	39
Dryer Jack	(561) 743-8696	www.DryerJack.com	74	49
Dynamic Fastener	(800) 821-5448	www.DynamicFastener.com	3/21	2/13
EPDM Coatings	(610) 298-1989	www.EPDMCoatings.com	72	46
Flex Roofing Systems	(800) 969-0108	www.FlexRoofingSystems.com	5	4
GAF	(973) 628-3000	www.GAF.com	40-41	36
Garland	(800) 321-9336	www.GarlandInd.com	81	55
Green Link	(888) 672-9897	www.GreenLinkEngineering.com	49	41
GSSI	(800) 288-9489	www.GSSISealants.com	4	3
IKO	(310) 320-6300	www.IKO.com	47	40
IR Analyzers	(800) 879-1964	www.IRAnalyzers.com	57	44
Kee Safety	(800) 851-5181	www.KeeSafety.com	76	52
Lakeside Fastener	(740) 244-5911	www.Lakeside-Fastener.com	32-33	33
LM Curbs	(800) 284-1412	www.LMCurbs.com	73	48
Marathon Drains	(800) 824-8424	www.MarathonDrains.com	42	37
Maze Nails	(800) 435-5949	www.MazeNails.com	31	32
Metal Plus LLC	(860) 379-1327	www.MetalPlusLLC.com	84	58
MetalForming	(770) 631-0002	www.Metalforming-USA.com	27	22
MFM Building Products	(740) 622-2645	www.MFMBP.com	25	17
Mule-Hide Products Co. Inc.	(800) 786-1492	www.MuleHide.com	20	12
Nationwide Protective Coatings	(800) 423-7264	www.NationwideCoatings.com	75	50
NB Handy	(434) 847-2498	www.NBHandy.com	35	35
Petersen	(888) 942-2636	www.PAC-CLAD.com	11	7
Polyglass	(954) 233-1239	www.Polyglass.us	13	8
Progressive Materials	(812) 944-7803	www.PMSilicone.com	29	27
RK Hydrovac	(800) 762-8361	www.RKHydrovac.com	83	57
Roof Hugger	(800) 771-1711	www.RoofHugger.com	75	51
Royal Adhesives	(517) 841-7108	www.RoyalAdhesives.com	23	15
Snojax	(717) 458-7880	www.Snoblox.com	53	43
SofSURFACES	(800) 263-2363	www.SofSURFACES.com	15	9
Soprema	(330) 331-3062	www.Soprema.us	9	6
Standing Seam Roof Anchor	(863) 703-4522	www.FallPD.com	24	16
Stinger	(800) 968-6245	www.Stingerworld.com/media/videos	2	1
Swenson Shear	(877) 588-8748	www.SwensonShear.com	77	53
Triad Corrugated Metal	(866) 625-9727	www.TriadMetalRoof.com	79	54
WSRCA	(800) 725-0333	www.WSRCA.com	51	42
Zimmerman Metals	(303) 294-0180	www.ZimmermanMetals.com	6	5

Setting the Standard in Roof Preparation Services

Serving the Roofing Industry for over 33 years!



Dedicated to the Roofing Industry with a full line of Roof Vacuuming Services:

- Ballast Removal
- One Pass Dry Vacuum
- Wet Vacuum
- Pneumatic Ballasting

We provide the most reliable roof preparation in the business. RK's experience, technology, and timeliness permit us to handle numerous projects at a time and we are available 364 days a year. RK is setting the standard in roof vacuuming services.

RK Hydro-Vac, Inc.

1-888-493-7682
www.rkhydrovac.com

METAL PLUS LLC

METAL ROOFING TOOLS AND ACCESSORIES

THE WORLD'S BEST
STANDING SEAM METAL ROOFING BRACKETS!

USA
Universal Safety Anchor
FOR STANDING SEAM ROOFS
Product Line of METAL PLUS LLC

IT TAKES LESS THAN A MINUTE TO INSTALL!

ASK US ABOUT
UNIVERSAL SAFETY ANCHORS

IT'S EASY! OPEN - CLOSE - TORQUE

S-5!® The Right Way!

S-5-PV KIT SOLAR AVAILABLE!

860-379-1327
METALPLUSLLC.COM