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# CAROLINAS CONTACTS

*CRSMCA – Covering the Carolinas for over 65 Years*



**RAINWATER MANAGEMENT:  
TAPERED INSULATION ON LOW-SLOPE ROOFS**

JULY/AUGUST 2021

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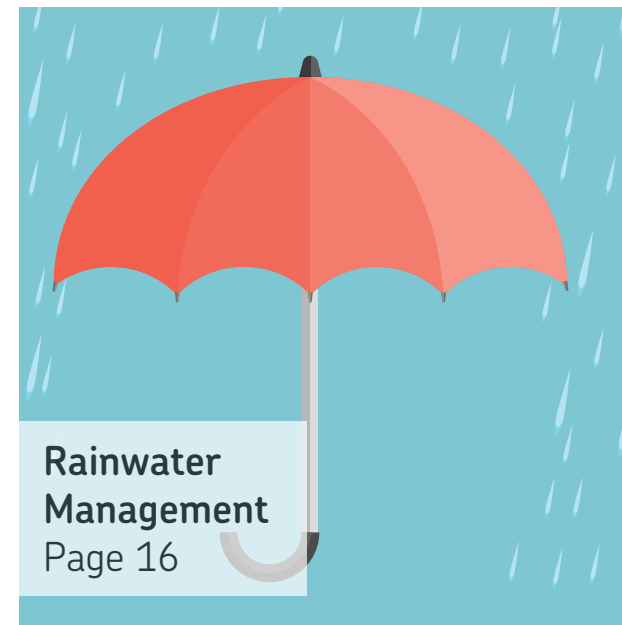
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## Letter from the PRESIDENT

As the new incoming President, I would like to thank GOD for what he has done in my life. I am blessed to have a wonderful family and a great career in the roofing industry. With that being said, I want to thank the CRSMCA and all members, past and present.

As I get started, I want to welcome our two new Board members, Bobbie Jo Deal as Secretary/Treasurer for the Executive members and Tara Burgi as Secretary/Treasurer for the Associate members. This will be exciting to have women getting more involved in our industry.

I would like to say, I am excited and looking forward to the challenges for 2021-2022. Even though we are post COVID-19, we

are still dealing with vaccines and potential health issues with new strains of the virus. Not to mention the labor shortage, not just here, but across the country. The big question is "How do we fix it?". Both take time to work out, but we need to be talking about it now and come up with solutions along the way so we can keep the economy moving in the right direction.

I hope you were able to get to our Carolinas Roofing Expo that was held at Hilton Head Island last month. Even though it was a hybrid event, it was a great turnout! A big thank you to all who attended! Look for your picture in the following pages.

I would also like to take this opportunity to invite you to sign up and register for our upcoming 2022 Carolinas Mid-Win-

ter Roofing Expo in January that will be held in Columbia, SC.

One of the topics in this article is about Roof Drainage & Tapered Insulation. Please take a few minutes to read over the articles. You just may learn something new today!!

OK, last item... as you may be getting tired of reading my articles, the next event is our 4th Annual Golf Tournament, October 14th, 2021 at the Rocky River Golf Course in Concord, NC. If you haven't already signed up and registered, please do so as this event is filling up fast!

Hope everyone has a great finish of the summer! —Matthew Williams, CityScape Roofing, Inc

### CAROLINAS ROOFING & SHEET METAL CONTRACTORS ASSOCIATION

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Carolinas Contacts addresses issues and concerns of the roofing industry. Technology, test, and building codes are constantly changing, and such changes may not be reflected herein. All information is presented for the benefit of our readers and does not necessarily reflect the views of CRSMCA. Press releases and product information presented do not reflect all available materials. Before purchasing, installing, using, or recommending any product, system, or method, readers should make independent evaluations.

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### THE CRSMCA MISSION STATEMENT

To promote and safeguard the common business interest of its members and to improve conditions by educating all persons concerning the roofing and sheet metal business and industry. To work for the development and progress of the roofing and sheet metal business industry and to work with individuals' organizations and governmental agencies toward the achievement of a stronger profession of the roofing and sheet metal industry.



## Letter from the ASSOCIATE GROUP PRESIDENT

I would like to start off by thanking all those involved in helping the association navigate through these unprecedented times. Many of the decisions the Contractor & Associate Group Boards have made were arduous at times, but all were made in good faith, with the common goal to keep the CRSMCA fiscally healthy while continuing to fulfill our mission statement. Carla, Eric Campbell, & Bubba Kearse have done an exceptional job in leading this effort.

Additionally, thanks are certainly in order to those that continue to support the CRSMCA whether it's through sponsorships, donating your time/expertise, or simply attending any (or all) of our organized events. I'm a believer that these events make us better as an industry by helping build relationships, increasing knowledge, & forming lasting partnerships. Our next two events will be the 4th Annual Golf Tournament (Oct 14th - Concord, NC) & 2022 Carolinas Mid-Winter Roofing Expo (January 18-20 - Columbia, SC). I encourage everyone reading this to not only attend these events but to also invite:

- A member that has not been actively engaged in recent years.
- People within your company that have never participated.
- Non-members you feel could benefit from getting involved in the association.

People are the lifeblood of the association. We will all benefit from increased participation & having a greater knowledge base.

As Associate Group President, my primary goals will be to:

- Continue to enhance the value of the CRSMCA by supporting current education/training programs and developing additional opportunities to provide to our current & potential future members.
- Develop & facilitate additional events that will increase networking opportunities with the potential to generate additional revenue for the CRSMCA.

Lastly, I would like to thank & recognize the current Associate Group Board currently serving with me:

- 1st Vice President - Chris Love, Mid-States Asphalt
- 2nd Vice President - Darren McEvoy, Premier Building Products
- Secretary/Treasurer - Tara Burgei, Johns Manville
- Immediate Past President - Bubba Kearse, ABC Supply Co., Inc.

All of us are here to assist in the management & growth of the Association. Feel free to reach out to anyone of us to discuss what the CRSMCA is up to, what it can do for you, or how you can get involved. —Sean Dougherty, Johns Manville CRSMCA 2021-2022 Associate Group President

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## Association IN ACTION

**Happy New Year!** It's the beginning of CRSMCA's 2021-2022 year...I would like to welcome our new Presidents for CRSMCA! Matthew Williams, CityScape Roofing, Inc. (Claremont, NC) – CRSMCA President and Sean Dougherty, Johns Manville (Raleigh, NC) – CRSMCA Associate Group President. I am looking forward to working with them as they bring new ideas and changes to CRSMCA.

Your Board members for the 2021-2022 year are as follows:

### CRSMCA Executive Committee

- President – Matthew Williams (CityScape Roofing, Inc.)
- 1st Vice President – Bert Pickens (Pickens Contracting, Inc.)
- 2nd Vice President – Jason Tetterton (Curtis Construction Co., Inc.)
- Sec/Treasurer – Bobbie Jo Deal (CityScape Roofing, Inc.)

### Associate Group Executive Committee

- President – Sean Dougherty (Johns Manville)
- 1st Vice President – Chris Love (Mid-States Asphalt)
- 2nd Vice President – Darren McEvoy (Premier Building Products, Inc.)
- Secretary/Treasurer – Tara Burgei (Johns Manville)

**CRSMCA needs more district directors!** The CRSMCA Board is in need of Contractors to support and volunteer to help the success and growth of CRSMCA. As a District Director, you are asked to attend two (2) Board of Director meetings in January and June and discuss and share ideas to better the CRSMCA and the roofing industry; assist in promoting the Annual Golf Tournament; assist in location planning and promoting of the Spring District socials/meetings; and promote the CRSMCA in your community. PLEASE CONTACT ME IF YOU OR SOMEONE IN YOUR COMPANY IS INTERESTED!

### REMINDER OF CRSMCA'S UPCOMING EVENTS

**CRSMCA's 4th Annual Spring Golf Tournament**  
October 14, 2021 | Rocky River Golf Club, Concord, NC  
Sponsored by Superior Distribution

Enjoy a day of fun with your peers on the golf course. This is a great opportunity for the roofing industry to unite in a networking and fun environment; vendors can participate at a sponsored hole to interact with players and contractors can participate as players and have an opportunity to purchase Mulligan Packages as well as raffle tickets for prizes during the tournament. Registration details are available on the CRSMCA website.

### CRSMCA'S CALL TO MEMBERS...

The CRSMCA Planning Committee is making a call to all public speakers: apply to teach a seminar at the upcoming 2022 Carolinas Mid-Winter Roofing Expo in Columbia, South Carolina! We believe the quality of our membership provides a valuable knowledge base to tap into, driving even more relevance and learning opportunities for our attendees. To be considered, please request your "Presenters Application" via email to [cbsims@crsmca.org](mailto:cbsims@crsmca.org), and provide "Presenters Application Request" in the subject line. Applications will be reviewed and selected on August 26!

### NRCA/MRCA CERTA Train-the-Trainer December 9, 2021 | CRSMCA Office, Charlotte, NC

The CERTA training program is ideal for contractors whose work involves torch applications. The full-day program trains experienced roof system installers on the safe use of roofing torches used to apply polymer-modified bitumen roofing products. CERTA training shows how proper roof system configuration design and application techniques can result in fire-safe installations. This course is open to CRSMCA members and non-members with LIMITED seats. For details and registration (online or printable form) visit the website.

### CRSMCA's 2022 Carolinas Mid-Winter Roofing Expo January 18-20, 2022 | Columbia Metropolitan Convention Center, Columbia, SC

CRSMCA is returning to its original date of hosting one of their largest regional roofing trade shows in the southeast. With almost 100 exhibiting companies providing details for the roofing industry, from safety tools to equipment to the latest technology; and over 400 contractors, architects, consultants, etc. attending for education and networking. CRSMCA also offers educational opportunities with up-to-date roofing industry seminars and top professionals leading the education. Don't miss the opportunity to be a part of the latest in the roofing industry, whether exhibiting or attending. Registration will be open in August 2021, please visit the CRSMCA website for more details, to register online or find your printable PDF forms.

As always, if your company needs any form of training, please contact the CRSMCA office to discuss how CRSMCA can help your company stay safe and educated when on the job!

I look forward to seeing you all at the next CRSMCA event that is approaching soon. There is always growth and strength in numbers and opportunities to grow not only YOUR CRSMCA, but YOUR roofing industry! —Carla B. Sims, CRSMCA Executive Director



### LEARN ABOUT THE CRSMC SELF-INSURERS FUND

Carolinas Roofing and Sheet Metal Contractors – Self-Insurers Fund is the oldest worker's Compensation group funded in the Carolinas and could be saving your company money! Members within the CRSMC-SIF program are not just purchasing their workers compensation but investing into a program that brings additional value to their company through a commitment to ensure the safety of their employees. As a member/customer within the program, you participate in building a fund that is beneficial for all members/customers within the program, you could receive competitive rates within the insurance industry, and you could receive a return of interest determined by the CRSMC-SIF Trustees and other approved returns during the year. In the year 2018, the CRSMC-SIF returned more than \$1 MILLION DOLLARS to the CRSMC-SIF members!

Additionally, the CRSMC-SIF is large component of support for the CRSMCA through sponsoring the CRSMCA Annual Meeting/Summer Convention and attendance of Trustees at the event. HAVE YOU CONSIDERED CRSMC-SIF FOR YOUR WORKERS COMPENSATION NEEDS?



### General Information

803-896-7665 [askscosha@llr.sc.gov](mailto:askscosha@llr.sc.gov)

OSHA's Office of Outreach and Education provides a variety of training programs and presentations designed to reduce or eliminate safety and health hazards in the workplace. Training is available to employers and employees of both the public and private sector upon request and may occur on-site (requiring participation of 12 or more employees).

General industry, health, and construction areas are covered in the training curriculum. Examples of training programs offered include:

- The OSHA Inspection Process
- Bloodborne Pathogens
- Lockout/Tagout (LOTO)
- Trenching/Excavation
- Hazard Communication
- Fall Protection (General Industry or Construction)
- Personal Protective Equipment
- Workplace Violations
- Scaffolding
- Confined Spaces
- Industrial Truck Safety Requirements
- OSHA Injury & Illness Record Keeping

To inquire for training, click here.

### WHAT IS THE CRSMCA MASTER INSTALLER CERTIFICATION?

The CRSMCA Roofing Academy Master Installer Certification Program is designed to promote safety issues and concerns in the application of the roof systems to prepare the employee for best practices in their job performance. It is intended for the use by anyone with an interest in these roof systems, from roofing workers to foremen to supervisors. It is a culmination of efforts by contractors, manufacturers, suppliers and others who are dedicated to promoting safety.

Enrolled students will learn and train the basics of roofing, in-



creasing their knowledge and skills to make them more valuable to their respective companies, as well as build future leaders in the roofing industry.

### HOW CAN YOU GET INVOLVED?

The CRSMCA Roofing Academy Committee is always searching for instructors of the classroom material and the hands-on demonstration. View the class and hands-on courses in this issue. Should you wish to be an instructor, donate materials, and/or be a hands-on instructor; please contact the CRSMCA office at 704.556.1228 or [cbsims@crsmca.org](mailto:cbsims@crsmca.org) or the Committee Chairman, David Griffin, at [dgriffin@coastalcommercialroofing.com](mailto:dgriffin@coastalcommercialroofing.com).



NRCA launches supply chain shortage information webpage The COVID-19 pandemic has affected the roofing industry in numerous ways, including leading to a widespread shortage of materials. The prices for materials have been increasing, and supply chains have been disrupted as lockdowns, tariffs and other factors cause delays and limited availability.

In response, NRCA has made available a Supply Chain Shortage Information webpage to help its members stay up to date with the latest news regarding materials shortages and price hikes in the industry.

The new page also houses a recording of NRCA's April 22 Live Action Alert: Supply Chain Shortages, during which NRCA CEO Reid Ribble and NRCA Vice President of Technical

*Continued on page 8*

Services Mark Graham discussed the materials shortage issue facing the roofing industry. Visit the Supply Chain Shortage Information page.

### CONSTRUCTION MATERIAL PRICES CONTINUED TO RISE IN JUNE

An Associated Builders and Contractors analysis of information provided by the Bureau of Labor Statistics shows construction material prices rose 2.8% from May to June, according to www.abc.org. On a year-over-year basis, the price of construction materials increased 24.8%.

Nonresidential construction material prices rose 2.9% from May to June and increased 24.6% compared with one year ago. Softwood lumber prices are up 125.3% year-over-year though are down 2.1% from May to June. Iron and steel prices are up 73.2% year-over-year.

"This is becoming a real challenge for America's nonresidential construction industry," said ABC Chief Economic Anirban Basu. "Not only are these rising materials prices likely to induce more project owners to delay project starts, but ongoing inflation also makes it more likely that the Federal Reserve will have to begin tightening monetary policy sooner than anticipated and with greater force. Should that occur, interest rates will be pushed higher, adding to project financing costs. That could further forestall nonresidential construction's recovery despite ABC's Construction Confidence Indicator suggesting rising contractor optimism."

### RISING MATERIAL PRICES CREATE AN UNPREDICTABLE BID PROCESS

Construction companies, manufacturers and other businesses that submit bids to win jobs say the bid process has become a gamble as rising material costs can lead to potential losses, according to The Wall Street Journal.

### ONLINE REGISTRATION IS OPEN FOR 2021 IN-PERSON IRE.

Online registration is open for the 2021 in-person International Roofing Expo,® an Informa Markets event, which will be held at the Mandalay Bay Convention Center in Las Vegas Aug. 10-12. Registration may be completed by visiting www.theroofingexpo.com.

Some construction and manufacturing executives said they are losing profits on jobs or paying out of their own pockets to cover material costs that exceed their bids.

Rising prices for steel, copper, brass, lumber, laminate sheeting and plastic-based materials reportedly are especially difficult to factor into bids as inventories remain tight amid growing demand.

Jeff Harper, president of Harper Construction Co., San Diego, said he has paid about \$2 million this year to cover material costs that exceeded his company's bids. Harper's company builds structures for federal agencies and the military, and he said federal contracts typically have no provisions for contractors to recover higher costs for materials once a bid is accepted.

"It's a real gamble," Harper said. "It's tough right now to figure out how to get work against a dozen competitors and not lose your tail in the process."

Months often can pass between when bids are submitted and when the work begins. Materials suppliers typically guaranteed prices for 60 to 90 days and often stuck to those prices if orders came in later; now, suppliers are quoting prices for a week or two, and many will not honor the prices beyond that.

Builders must do more estimating regarding materials expenses than ever before, which can be risky. Companies that incorporate too many price increases can be easily underbid by competitors who do not. Underestimating can lead to higher costs later for building and manufacturing companies, and customers often will not cover those costs once a contract is signed.

Some companies are adapting by including protections, such as materials

surcharges, in their contracts to combat rising costs.

### START SAFELY, END SUCCESSFULLY

Online programs for all levels...Register at www.nrca.net/nrcauniversity

NRCA has a vast array of NRCA benefits to help your business prosper. Visit www.nrca.net/membervnavigation to learn more.

NRCA is continuing their popular series of FREE WEBINARS on the third Thursday of each month. These new and innovative webinar topics and presenters have been selected to expand your knowledge by giving you new ideas that you can implement into your company immediately. Each webinar offers a unique experience specifically tailored to roofing professionals. Don't miss out on these live opportunities to stay up to date with industry issues affecting your business.

For upcoming webinars and previous recordings, visit www.nrca.net/webinars.

### UP AND DOWN EASTERN U.S.

- Florida Roofing & Sheet Metal Association, www.floridarroof.com
- Georgia Roofing Contractors Association, www.rsmca.org
- Kentucky Roofing Contractors Association, www.krca.org
- Palm Beach County Roofing & Sheet Metal Contractors Association, www.pbcroofer.com
- Roofing Contractors Association of South Florida, www.rcasf.org
- Southwest Florida Roofing Contractors Association, www.swfrca.net
- Tennessee Association of Roofing Contractors, www.tarcroof.org
- Virginia Association of Roofing Professionals, www.varoofingprofessionals.org



### NC DEPARTMENT OF LABOR/ OSH

Compliance Bureau Contacts

- Tim Childers | 336-776-4420 | tim.childers@labor.nc.gov
- Phil Hooper | 919-779-8512 | phil.hopper@labor.nc.gov

### NCDOL PROVIDES VIRTUAL CONSULTATION FOR SMALL BUSINESS DURING PANDEMIC

NCDOL Labor Ledger march-April 2021, by Dolores Quesenberry, Public Information Officer

With the help of virtual technology during the COVID-19 pandemic, NCDOL's Consultative Services Bureau continued providing its FREE safety and health consultative visits to small- and medium-sized business throughout the state.

While these virtual visits cannot replace on-site consultation, they have provided a way for the bureau to continue its mission of:

- Helping small business identify and eliminate workplace hazards
- Providing advice on complying with OSHA standards
- Training and education workers
- Helping employers establish and improve written safety and health programs

The consultation program offers no-cost and confidential occupational safety and health services for small and medium-sized business, that is separate from the Occupational Safety and Health Division's compliance bureaus and its safety and health consultants do not issue citations or penalties.

The Consultative Services Bureau has consultants located throughout the state who are available to help you create a safer work environment. To find out more information about what services are available or to learn how to initiate the process, please contact the Consultative Services Bureau at 919.707.7846 or visit the NCDOL website (www.labor.nc.gov)

Training information, registration and training course and dates can be found at https://www.labor.communications.its.state.nc.us/OSHPublic/ETTA/class\_regist/calendar.cfm

### TRAINING EVENTS

- 30-Hour General Industry Awareness Course (Raleigh, NC) August 16
- 10-Hour General Industry Awareness Course (Raleigh, NC) August 16
- 10-Hour General Industry Awareness Course (Raleigh, NC) August 25

The NCDOL is pleased to offer pre-recorded webinars ready for you and your employees to view at your convenience. To access a webinar visit https://www.labor.communications.its.state.nc.us/OSHPublic/ETTA/class\_regist/calendar.cfm, double-click on the applicable safety and health topic below and it will automatically start the training session.

*Note: Some of the webinars are hosted on a training platform and will require you to log in with your name and email in order to access the training session.*

The Department of Labor does not provide certificates for employees viewing our pre-recorded webinars. These webinars were live recordings and contain chat conversations. For this reason, you will not be able to interact with the instructor during the recording. If you prefer to receive a certificate and have interaction with an instructor, please refer to our training schedule above for current live webinar offerings.

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# CAROLINAS ROOFING EXPO PHOTO RECAP



# CONCERNS WITH ROOF DRAINS

Recent code changes may affect roof drainage system design for low-slope roof systems

Written by Mark S. Graham, NRCA Technical Services | Published in Professional Roofing, April 2018

Recently, changes have been made to the current model building and plumbing codes that may affect roof drains and roof drainage system design for low-slope roof systems. You should be aware of how these changes can affect your new construction and reroofing work.

## HISTORICAL METHODS

The design of roof drainage systems, including roof drains, scuppers and gutters, traditionally has been addressed in the applicable plumbing code and generally is considered to be the responsibility of plumbing designers. For example, in the International Code Council's (ICC's) International Plumbing Code® (IPC), sizing of roof drains, scuppers and gutters—and any related conductors and leaders (drain piping, downspouts)—are addressed in Chapter 11-Storm Drainage.

Through the 2012 edition of the IPC, the sizing of roof drainage systems primarily was based on designing vertical conductors and leaders to accommodate a 100-year hourly rainfall rate or another rainfall rate determined from local weather data approved by the code official or other authority having jurisdiction. The IPC includes maps indicating the 100-year hourly rainfall rates expressed in inches.

In the International Building Code® (IBC), a statement is made in Chapter 15-Roof Assemblies and Rooftop Structures indicating the design and installation of roof drainage systems shall comply with the IPC.

Some jurisdictions may not adopt the same editions of the IPC and IBC. Other jurisdictions may adopt plumbing codes other than the IPC. Both scenarios can create difficulties and potential conflicts between the building and plumbing codes as they relate to roof drainage system design.

## RECENT CHANGES

Beginning with the publication of the 2009 I-Codes and continuing to the current edition (2018 I-Codes), additional roof drainage requirements were added to the IBC's Chapter 15, including provisions requiring secondary drainage and for scuppers when they are used as secondary drainage. Secondary roof drains or scuppers are required when the roof perimeter extends above the roof surface in such a manner that water will be entrapped if the primary roof drains are clogged.

Because the IBC's provisions for reroofing require roof system re-cover and replacement comply with the same Chapter 15 requirements as for new construction (except minimum roof slope), it may be interpreted secondary roof drainage provisions need to be added in reroofing projects when the existing roof system does not already include secondary drainage.

Review of the code change proposal (ICC Code Change FS167-06/07) that added these provisions to IBC 2009's Chapter 15 shows applicability to reroofing situations was not intended.

In IBC 2015, a provision was added to Chapter 15's reroofing requirements indicating secondary drains or scuppers are not required to be added if they were not already present for roofs that do not pond water. This provision also appears in IBC 2018.

Also, beginning with IPC 2015, the method for sizing roof drainage systems now is determined by roof drain manufacturers' published flow rates based on a head (height) of water above the roof drain. The flow rate for conductors and leaders shall be based on the maximum anticipated ponding height at the roof drain.

## WHAT IT MEANS

The method for designing roof drainage

systems has changed notably with the recent editions of the I-Codes. Generally, these changes result in the need for higher capacity roof drainage systems than those designed using historical methods.

Also, I-Codes' roof drainage design provisions related to reroofing situations is subject to possible misinterpretation.

NRCA has reviewed roof drain and drain insert manufacturers' product literature for their published flow rates and has surveyed manufacturers for design information necessary for complying with the current editions of the plumbing codes. Few (if any) manufacturers currently provide the information necessary for strict compliance with IPC 2015 or IPC 2018.

As a part of its ongoing code development process, ICC is considering a number of code change proposals intended to clarify and revise requirements for roof drainage system design. If accepted by ICC's membership, the revisions would first appear in the 2021 I-Codes.

Until the roof drainage provisions contained in the latest editions of the I-Codes can be appropriately clarified or revised, designers of roof drainage systems need to clearly define the extent and sizing of any intended roof drainage system work. Given the codes' current requirements and manufacturers' lack of code-compliant design information, performance-based statements simply indicating a design intent to comply with the applicable codes clearly are inadequate.

Designers of roof drainage systems can consult with the plumbing code official or the authority having jurisdiction for the code official's interpretation of the necessary requirements for roof drainage systems.

Mark S. Graham is NRCA's vice president of technical services. @MarkGrahamNRCA

# ROOF DRAINAGE SYSTEM CONSIDERATIONS

## Part 1

Written by Mike Silvers, CPRC, Owner, Silvers Systems, Inc. and FRSA Director of Technical Services | Published in Florida Roofing, August 2020

As roofing contractors, we endeavor to keep water outside of structures. With most roof drainage designs, we direct the water to the outside of the structure, but there are exceptions to this. Sometimes we purposely direct the water towards the inside. Hopefully, all of that water goes into a drain and then a leader (pipe), which keeps the water out of the interior elements. But when one considers that all of the water from the contributing roof area must pass over and through this drain, it often is not given the careful consideration it deserves. I hope to provide you with some specific code requirements and some observations that apply to interior drains, both primary and secondary. I will also cover some other types of drains like scuppers, porch tubes and flashings at the roof edge.

Properly performing roof drainage systems are a collaboration between the designer, the plumbing contractor (if drains are involved) and the roofing contractor. However, after the initial design and installation, most types of roof drainage, except for some of the plumbing components, are addressed primarily by the roofer. During reroofing (recovering or replacement) the roofing contractor is almost always the party responsible for work done to the drainage system regardless of the type.

Let's answer a couple of general code questions before we start into particular drain requirements.

When performing a reroof, do I have to bring everything that interfaces with the roof covering, including drainage, up to current code? No.

First, a reroof is an Alteration Level 1 and there is an exception and several other provisions that address this based on the following:

FLORIDA BUILDING CODE (FBC) EXISTING BUILDING (EB) 6TH EDITION (2017)

Chapter 2 Definitions  
Section 202 General Definitions

**Alteration.** Any construction or renovation to an existing structure other than a repair or addition. Alterations are classified as Level 1, Level 2 and Level 3.

Chapter 3, Provisions for all Compliance Measures  
Section 301 Administration

**301.1 General.** The repair, alteration, change of occupancy, addition or relocation of all existing buildings shall comply with one of the methods listed in Sections 301.1.1 through 301.1.3 as selected by the applicant.

**Exception:** Subject to the approval of the code/official, alterations complying with the laws in existence at the time the building or the affected portion of the building was built shall be considered in compliance with the provisions of this code unless the building is undergoing more than a limited structural alteration as defined in Section 907.4.4.

Section 302, General Provisions

**302.3 Existing Materials.** Materials already in use in a building in compliance with requirements or approvals in effect at the time of their erection or installation shall be permitted to remain in use unless determined by the building official to be unsafe.



Continued on next page

## Chapter 5 Classification of Work Section 503, Alteration – Level 1

**Scope.** Level 1 alterations include the removal and replacement or the covering of existing materials, elements, equipment, or fixtures using new materials, elements, equipment, or fixtures that serve the same purpose.

**Application.** Level 1 alterations shall comply with the provisions of Chapter 7.

Keep in mind that the actual work you are doing still must comply with the current code. There are also some very specific areas where some of the building elements must be addressed during certain alterations. One example of this is the deck re-nailing and roof-to-wall connection requirements covered under mitigation.

Does that mean that I can address the drainage as I choose? No.

The code has a common theme of not reducing compliance that addresses this, including:

## Chapter 7 Alterations – Level 1

**701.2 Conformance.** An existing building or portion thereof shall not be altered such that the building becomes less safe or energy efficient than its existing condition.

This provision is extremely important when it comes to drainage. Many of the roof drainage requirements are covered under the FBC Plumbing (P) volume. In particular, the size of roof drainage system is in this volume and is quite complex. If you have been doing any roofing work on new construction over the last 20 years or so, you know that the size of roof drains has greatly increased during that period. This means that drainage systems in buildings built prior to the current code are often undersized in comparison. If you reduce the capacity of the existing drainage system, it will most likely not meet the requirements in place at the time it was designed. This includes drains and scuppers, both primary and secondary, as well as other types of drainage such as porch tubes and edge flashing. You do not want to be the contractor who decided to reduce the ability of a roof to drain properly during a heavy



rain, particularly when it causes what could be a very serious problem.

In the HVHZ a change has been made to help clarify this in the new code:

### FBC Building (B) 7th Edition (2020) HVHZ

**1514.4 Roof drainage.** Unless roofs are sloped to drain over roof edges, roof drains shall be installed at each low point of the roof. If required, roof drains shall comply with the Florida Building Code, Plumbing. Where required for primary roof drainage, scuppers shall be placed level with the roof surface in a wall or parapet. The scupper shall be located as determined by the roof slope and contributing roof area. Scuppers shall be sized in accordance with the provisions contained in ASCE 7, Chapter 8 with commentary and shall comply with Section 1611 herein.

**1514.4.2.1** When overflow scuppers and roof drains are installed, they shall be lined with approved metal or other approved materials set forth herein.

**1514.4.2.2** When recovering, reroofing or repairing an existing roof, the existing number or size of required scuppers and/or roof drains shall not be reduced, unless a new drainage system is designed by a registered design professional in compliance with the provisions of this code.

**1514.4.3 Sizing and discharge.** Roof drains, gutters, conductors and leaders shall be sized and discharge in accordance with the Florida Building Code, Plumbing and ASCE 7, Chapter 8 with commentary.

So how can roofing contractors have a negative impact on the existing drainage system? There are numerous ways.

When you consider these code requirements, several areas come to mind. If you are installing a new tapered insulation system you may be completely changing the way the building was designed to drain. For additional information on this, please see these previous columns in Florida Roofing: Tapered Insulation Considerations – September 2018 and Tapered Insulation Considerations, Part II – October 2018. But back to the drains themselves.

One of the most common areas where we see the size of drains reduced is when a “retrofit” type drain (see picture 1 above) is used. Depending on the size of the original drain, a retrofit drain may reduce the effective opening of the drain by as much as 20 percent. This calls into question when they can be used. If the building has had interior drainage added to reduce ponding, it was not part of the original drainage design or it has multiple drains and effective secondary or overflow drainage and a concrete deck, you may be okay; but if it is an older building with parapet walls, a metal or wood deck and structure with no overflow provisions, it is a different story. So, a contractor must choose carefully where they use these drains.

How about using an inverted lead boot or a similar liner in a drain or, worse yet, for a drain? No.

The first problem with this approach is that if the drain is connected to a leader inside the building a “gravity seal” is not acceptable. If the drain backs up for any reason, including an extremely hard rain, the connection will leak. This drainage system must be able to withstand the pressure that will be created from water standing on the roof surface all the way to the discharge. Some liners have an expansion device to put pressure on the liner and against the pipe to attempt a seal. These devices can also reduce the effective area of the drain.

I referred to a “porch tube” (see pictures 2 and 3 above) earlier. A porch tube serves the same function as a drain, but is usually one piece that discharges or makes its first “gravity sealed” connection out-

side the building, usually below the soffit.

How do we comply with these requirements and still reroof a building with drains? You have many options.

This comes back to two main concerns; both typically can be addressed by reusing the original drains or with new replacement drains. You can't reduce the effective area of the drains and you need a watertight connection between the drain and the roof covering or, in the case of replacement drains, between the drain and the leader as well. To reuse the drain as originally intended, you need to achieve several things. It needs to be clean, particularly where the drain and the clamping ring (see picture 4 below) create a gasket effect.

Just like with any gasketed surface, contamination of these surfaces will create problems. If the drain doesn't use a gasket, it will usually have a flange. Some drains may use both a gasket and a flange. It is still important that the flange be clean and primed. The clamping ring must be there and match the drain. The bolts, washers and nuts must all function. You must use flashing at all roof drains because it is a termination and is required by the code. Field membrane alone does not satisfy this flashing requirement. In many roof systems, the flashing will be a lead sheet formed to fit the condition (see picture 5 below) Other systems may use a flashing membrane or an additional layer of field membrane. A drain should also have an appropriate cap, dome or screen. Being able to identify the manufacturer and model of the drain will be critical if any parts are broken, deteriorated or missing and you plan to reuse the drains. Most drain components will have identifying marks (see pictures 6 and 7 next page). If not, with some accurate dimensions and pictures, they can usually be identified by specialty distributors or some plumbing supply warehouses.

Often replacement and/or reworking of clamping ring bolts and the threads in the drain is required. This may require the use of drills, easy-outs, helicoils or taps to save the drain. If this can't be ac-

complished, the drain may need to be replaced by a licensed plumbing contractor. This can be the case if the drains use a synthetic rubber insert to seal between the drain body and the leader. You can replace the drains with new drains that do not reduce the effective opening size to correct any of these conditions.

## SCUPPERS

Another area of concern are scuppers. I have seen both primary and secondary scuppers that have been relined multiple times, sometimes with a new smaller metal scupper or multiple layers of flashing material. All of this reduces the originally designed effective opening of the scupper. Remember, if you are not redesigning the drainage system (use extreme caution if so) you need to maintain both the ability to drain the volume of water and the intent of the original design.

When recovering and/or adding insulation you will be raising the height of the roof covering. If the roof drains through

scuppers, you will need to either raise or widen the scupper to maintain the original size or create a sump in front of the scupper that maintains its original effective opening.

As I stated earlier, the Plumbing volume of the code contains much of the roof drainage information. Among other requirements, it contains the requirements for gutter and downspout sizing. I will address some of what is included there, as well as other drainage considerations, in a future article. Watch this space.

Hopefully, I've provided some information that will help you when considering how to address roof drainage during you re-roof projects.

*Mike Silvers, CPRC is owner of Silver Systems Inc. and is consulting with FRSA as Director of Technical Services. Mike is an FRSA Past President, Life Member, and Campanella Award recipient and brings over 40 years of industry knowledge and experience to FRSA's team.*

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## RAINWATER MANAGEMENT

### Tapered Insulation Can Prevent Ponding on Low-Slope Roofs

The primary and most important function of a roof membrane in a low-slope roof system is to provide weatherproofing by keeping the rainwater from entering the roof assembly. Ponding water poses the greatest risk to a roofing membrane, since it not only shortens its service life, but can lead to more serious life safety concerns when loads and deflections exceed the designed conditions. This could lead to a roof collapse. From an aesthetics standpoint, areas on roofs with a prevalence for ponding are susceptible to unsightly bacterial and algae growth as well as accumulation of dirt. Given the large footprint of low-slope roofs on typical commercial buildings, managing rainwater timely and effectively is an important design consideration in new roof design as well as roof replacements on existing buildings. In addition, the model building codes include requirements for minimum drainage slope and identify ponding instability as a design consideration for rain loads.

Tapered insulation systems are an integral part of roof system design and can help reduce or eliminate the amount of ponding water on the roof when the roof deck does not provide adequate slope to drain. The popularity of tapered insulation has grown as more designers and roofing professionals understand the importance of positive drainage in good roofing practice. Because of its wide use in low-slope roofing application, tapered polyiso insulation systems offer a number of benefits in addition to providing positive drainage: high R-value, versatility and customization to accommodate project-by-project complexity as well as ease of installation. This article highlights the key considerations for tapered insulation systems.

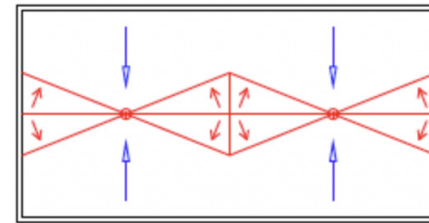


FIGURE 1a Two-way tapered insulation system

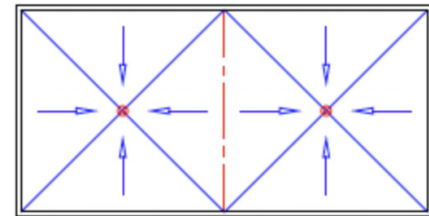


FIGURE 1b Four-way tapered insulation system

### SLOPE AND DRAINAGE REQUIREMENTS IN BUILDING CODES

The model building codes require that commercial roofs be sloped to achieve a positive drainage of rainwater to drains, scuppers, and gutters. The term “positive roof drainage” is defined in the 2018 International Building Code (IBC) as “the drainage condition in which consideration has been made for all loading deflection of the roof deck, and additional slope has been provided to ensure drainage of the roof within 48 hours of precipitation.” The 2018 IBC indicates a minimum design 1/4:12 units slope requirement for membrane roof systems, and minimum slope of 1/8 inch per foot for coal tar pitch roofs. New construction must comply with the minimum slope requirements in IBC Section 1507. Roof replacement or roof recover applications of existing low-slope roof coverings that provide positive roof drainage are exempt from the minimum prescriptive 1/4:12 units slope requirement.

Roof drains are part of an approved storm drainage system and function to divert water off and away from the building. Roof drainage systems in new construction must comply with provisions in Section 1502 of the 2018 IBC and Section 1106 and 1108 of the International Plumbing Code (IPC) for primary and

*Continued on next page*

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## DESIGN CONSIDERATIONS FOR TAPERED INSULATION SYSTEMS

Proper design and installation are critical to the effective performance of tapered polyiso insulation systems, and this is true for any product or system. Tapered polyiso is manufactured in 4-foot-by-4-foot or 4-foot-by-8-foot panels that change thicknesses over the 4-foot distance from the low edge to the high edge on the opposing sides of the panel. The standard slopes for tapered insulation are 1/8 inch, 1/4 inch and 1/2 inch per foot to accommodate specific project requirements. However, tapered insulation panels with slopes as low as 1/16 inch and other alternative slopes (3/16 inch and 3/8 inch per foot) can be specially ordered to accommodate unique field conditions. The minimum manufactured thickness of tapered polyiso insulation board at its low edge is 1/2 inch and the maximum thickness at the high edge is 4-1/2 inches.

The design of the tapered insulation system will be governed by the footprint and complexity of the roof under consideration, slope of the roof deck, presence and configuration of roof drains (primary and secondary), scuppers, gutter or drip edges. In addition, roof structures, height of parapet walls, expansion joints, curbs and through-wall flashings and any other elements that may obstruct water management also needs to be considered in the design phase. The tapered insulation system will be lowest at internal drains, scuppers, gutters and drip edges, and will slope upwards away from these features.

Keeping in mind that the primary goal of a tapered insulation system is to most effectively move water to the specified drainage points. A two-way (two directional slope) or four-way (four directional slope) system are the most common designs. A two-way tapered insulation system is commonly used on roofs where multiple drains are in straight lines. In this scenario, there is a continuous low-point between the drains and it often extends to the parapet walls. Crickets are installed in between the drains and be-

tween the building or parapet walls and the drains. (See Figure 1a.)

A four-way tapered insulation system is the most effective way to move water off the roof, and this approach is highly recommended by industry professionals. In this scenario with a drain located in the center, water is drained from the higher perimeter edges on all four sides. (See Figure 1b.) Variations of two-way and four-way systems exist to accommodate complexities in the field. In addition to two-way and four-way systems, one directional slope and three directional slope tapered systems can be used to effectively move water to gutters, drip edges and scuppers.

Keeping in mind that a tapered system is more expensive than a roof system constructed with standard flat insulation only, the tapered design is often a target for “value engineering.” Value engineering can compromise the drainage intent of the design professional, architect or roof consultant for the purpose of lowering the installed cost of the roof system. Value engineering may change the specified slope or redesign the configuration of the tapered panels. In the end, the building owner may pay for a tapered insulation system that does not effectively drain water from the roof as intended by the

original design. This will likely result in higher long-term costs for roof maintenance and premature roof system failure.

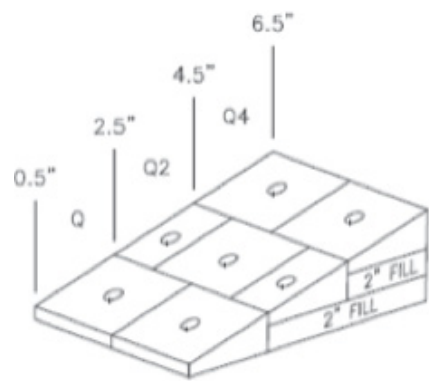
A typical tapered insulation system will incorporate flat polyiso board stock (referred to as “fill panels” or “tapered fill panels”) beneath continuing, repeating tapered panels. The tapered panels can be a single panel (or “one panel repeat”) system, meaning that the taper is provided by a single repeating panel in conjunction with fill panels. (See Figure 2a.) Non-typical designs can feature up to an eight-panel (or “eight panel repeat”) system with eight tapered panels making up the sloped section prior to incorporating the first fill panels. An example of “four panel repeat” system with 1-inch and 2-inch fill panels and 1/16 inch per foot slope is provided in Figure 2b.

Finally, crickets are an integral part of a tapered insulation system and are commonly used in two-way systems. Crickets can divert water toward drains and away from curbs, perimeter walls, and roof valleys. The two factors that must be considered in the design and installation of crickets are slope and configuration. The general “rule of thumb” is that for a full diamond cricket the total width should be between 1/3 to 1/2 of the total width. The wider the design of the cricket, the more you utilize the slope in the field of the roof, which improves the drainage efficiency.

Crickets typically have diamond or half-diamond shapes. (See Figures 3a and 3b.) However, kite-shaped and snub nose crickets can also be configured to accommodate specific roof designs. To keep water from remaining on the cricket surface, the design needs to have a sufficient slope (generally, twice the slope in the adjacent field of the roof). NRCA provides guidance regarding cricket geometry (see “The NRCA Roofing Manual: Membrane Roof Systems: 2019”).

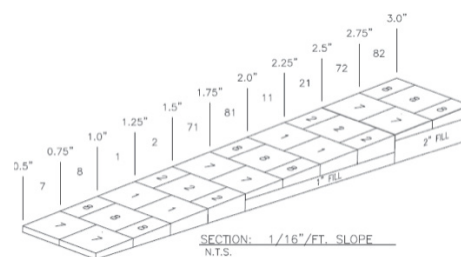
Tapered insulation systems offer a cost-effective solution to achieving positive slope and improved drainage in new roof systems and roof replacement applications. An adequate rainwater management strategy that includes both proper drainage and elimination of ponding water is critical to the longterm performance and durability of a roof system. In addition, proper design, detailing, and installation of products must be an integral part of a tapered roof system design. For more information, consult with a polyiso insulation manufacturer who provide guidance, design assistance, and technical information regarding tapered insulation systems. In addition, the Polyisocyanurate Insulation Manufacturers Association (PIMA) publishes technical bulletins to help navigate the process of designing a tapered system. PIMA’s Technical Bulletin #108 on Tapered Insulation Systems can be found at [www.polyiso.org/resource/resmgr/Tech\\_Bulletins/tb108\\_Mar2017.pdf](http://www.polyiso.org/resource/resmgr/Tech_Bulletins/tb108_Mar2017.pdf).

**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](http://www.polyiso.org).



SECTION: 1/16\"/>

FIGURE 2a Cross sections of a one panel repeat tapered insulation systems.

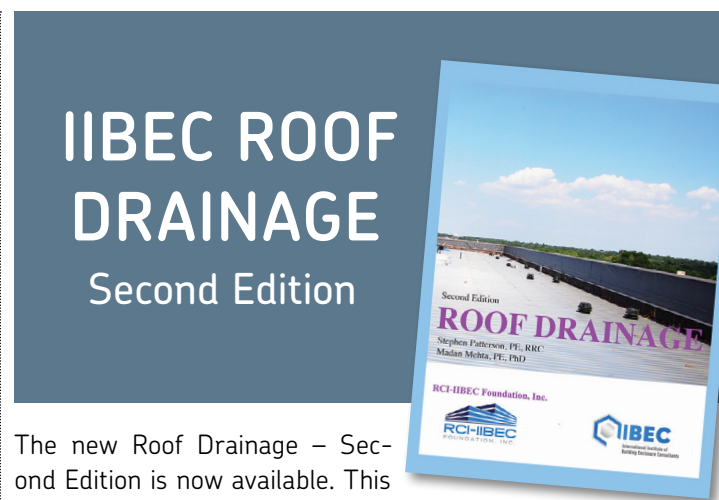
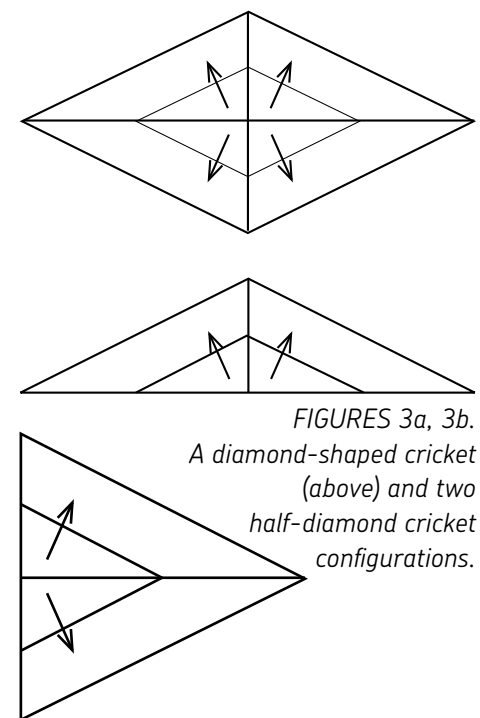


SECTION: 1/16\"/>

FIGURE 2b Cross-sections of a four panel repeat tapered insulation system.

secondary (emergency overflow) drains or scuppers. Roof replacement and recover applications on existing low-slope roofs that provide positive roof drainage are exempt from requirements for secondary drains or scuppers. It is important to note that secondary drainage systems or scuppers in place on existing buildings cannot be removed unless they are replaced by secondary drains or scuppers designed and installed in accordance with the IBC.

When reviewing the options available for achieving the required slope in a roof system, designers have a number of choices. According to the National Roofing Contractors Association (NRCA) (see “The NRCA Roofing Manual: Membrane Roof Systems: 2019”) the slope can be achieved by: sloping the structural framing or deck; designing a tapered insulation system; using an insulating fill that can be sloped to drain; properly designing the location of roof drains, scuppers and gutters; or a combination of the above.



The new Roof Drainage – Second Edition is now available. This publication was funded by the RCI-IIBEC Foundation as an update of the 2003 edition of the Roof Drainage monograph as a result of significant changes in the International Building Code (IBC), the International Plumbing Code (IPC) and the methods used for roof drainage design. The authors of Roof Drainage are IIBEC member Stephen L. Patterson, RRC, PE, of Roof Technical Services, Inc. and Dr. Madan Mehta, PhD, PE, with the University of Texas at Arlington.

“We now know that the flow through a vertical leader and a roof drain are unrelated. Unlike the flow through a vertical leader, which is simply related to the pipe diameter, the flow through a roof drain is a function of several factors, such as the head of water over the drain’s rim, rim diameter, drain bowl depth, drain outlet diameter, and the strainer. As a result, the familiar plumbing code tables giving maximum drainable roof areas for roof drains became inapplicable and have been deleted from the codes. This left a large gap for the design disciplines to address.”

“Compounding the problem has been the continuing discrepancies between the three plumbing codes, which give different provisions for the same design issue. Existence of unexplainable discrepancies within the same plumbing code has been another problem. It is in this context that we decided to work on the second edition of Roof Drainage.”

“This monograph has been written as a textbook to serve all three disciplines—architecture, plumbing engineering, and structural engineering,” said Dr. Mehta. “We have learned a great deal since the 2003 publication and have incorporated it into this book.”

“Both Steve Patterson and Dr. Mehta deserve a great deal of thanks and praise,” said Mike Blanchette, chair of the RCI-IIBEC Foundation. “Their work on this publication took much longer than expected due to the complexity and changes that have taken place (in addition to the impact of COVID-19). The RCI-IIBEC Foundation is honored to have supported this work and we look forward to sharing this knowledge with the entire building enclosure industry.”

The publication is now available through the IIBEC website in both printed and electronic versions.

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The magazine provides valuable information from products to services and regulations that are important to the roofing industry businesses as well as news and events within the roofing industry.

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*Ads due: January 15*

### March/April

2021 Carolinas Mid-Winter Roofing Expo event details; Focus on Residential (Shingles); National Roofing Week; Ladder Safety Awareness  
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### July/August

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*Ads due: July 15*

### September/October:

Insulation & Coverboards; Fire Prevention Awareness; 2022 Carolinas Mid-Winter Roofing Expo event details  
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## YOUNG AND INEXPERIENCED

**Summer is here**, and the typical seasonal increase in construction coupled with a very challenging labor market has likely resulted in an increased number of younger workers for most roofing companies.

Unfortunately, all too often these young and inexperienced employees are treated the same as other employees when it comes to on-the-job safety. However, to do that is a mistake on the part of management and a mistake on the part of any employee who will be working with them. In reality, they need significantly more training and attention from supervisors and their new co-workers.

There are at least three reasons for this – (1) age, (2) experience, and (3) social dynamics.

**Age:** This probably could be better described as “hormonal.” Young employees (particularly young men) are impulsive, take chances, and have a lack of appreciation of hazards. This is a generalization and there are exceptions, but it is likely true for at least 9 out of 10 young men entering the workforce for the first time. In the realm of occupational safety, this characteristic is known as the “Superman Complex,” because the person feels somewhat invincible – even if that feeling stems purely from a failure to recognize and contemplate hazards. It can be very dangerous especially when the employee is using a machine that could amputate a body part or is working at elevations.

**Experience:** The fact is that young employees are inexperienced employees. They do not have any significant work history.



None of us did when we started. It is normal, but not safe. It is a mistake to assume young workers are competent just because they are confident.

**Social Dynamics:** This factor is linked to both of those described above. Social relationships are extremely important to young people. They want to fit in and they want to make a good first impression. This needs to be controlled; otherwise, they will end up hurting themselves or someone else. Two of the best ways to control this is by providing detailed instructions and training, and by supervising young employees very closely. Also, if there is more than one young employee, they should not work side by side, as that invites “social/occupational competition.” Remember when you were young and someone dared you to do something risky? The only reason you would even consider doing it was if someone “witnessed” the event. If you have young employees then separate them so they won’t tempt one another to do something unsafe.

### DISCUSS WITH YOUR CREW

- What ill-advised things did you do as a young and inexperienced worker?
- What stories do you have about working with young and inexperienced employees?
- What young or inexperienced workers are on our crew?
- What can you do to help prevent those employees from getting hurt on the job?

## JÓVENES E INEXPERTOS

**El verano está aquí**, y el típico aumento estacional en la construcción, junto con un mercado laboral muy desafiante, probablemente ha resultado en un mayor número de trabajadores más jóvenes para la mayoría de las compañías de techos.

Desafortunadamente, con demasiada frecuencia estos empleados jóvenes e inexpertos reciben el mismo trato que otros empleados cuando se trata de seguridad en el trabajo. Sin embargo, hacer eso es un error por parte de la dirección y un error por parte de cualquier empleado que vaya a trabajar con ellos. En realidad, necesitan mucha más capacitación y atención de los supervisores y sus nuevos compañeros de trabajo.

Hay al menos tres razones para esto: (1) edad, (2) experiencia y (3) dinámica social.

**Edad:** Esto probablemente podría describirse mejor como “hormonal”. Los empleados jóvenes (particularmente los hombres jóvenes) son impulsivos, se arriesgan y no aprecian los peligros. Esta es una generalización y hay excepciones, pero es probable que sea cierto para al menos 9 de cada 10 hombres jóvenes que ingresan a la fuerza laboral por primera vez. En el ámbito de la seguridad en el trabajo, esta característica se conoce como el “Complejo Superman”, porque la persona se siente algo invencible, incluso si ese sentimiento proviene puramente de la falta de reconocimiento y contemplación de los peligros. Puede ser muy peligroso, especialmente cuando el empleado está usando una máquina que podría amputar una parte del cuerpo o está trabajando en elevaciones.

**Experiencia:** El hecho es que los empleados jóvenes son empleados inexpertos. No tienen ningún historial de trabajo significativo. Ninguno de nosotros lo hizo cuando empezamos. Es normal, pero no seguro. Es un error asumir que los trabajadores jóvenes son competentes sólo porque tienen confianza.

**Dinámica Social:** Este factor está vinculado a los dos descritos anteriormente. Las relaciones sociales son extremadamente importantes para los jóvenes. Quieren encajar y quieren dar una buena primera impresión. Esto hay que controlarlo; de lo contrario, terminarán lastimándose a sí mismos o a otra persona. Dos de las mejores maneras de controlar esto es proporcionando instrucciones detalladas y capacitación, y supervisando a los empleados jóvenes muy de cerca. Además, si hay más de un empleado joven, no deben trabajar codo con codo, ya que eso invita a la “competencia social / ocupacional”. ¿Recuerdas cuando eras joven y alguien te atrevía a hacer algo arriesgado? La única razón por la que incluso consideraría hacerlo era si alguien “presenciaba” el evento. Si tiene empleados jóvenes, sepárelos para que no se tentarán unos a otros a hacer algo inseguro.

### DISCUTA CON SU TRIPULACIÓN

- ¿Qué cosas desafortunadas hiciste cuando eras un trabajador joven e inexperto?



- ¿Qué historias tienes sobre trabajar con empleados jóvenes e inexpertos?
- ¿Qué trabajadores jóvenes o inexpertos están en nuestra tripulación?
- ¿Qué puede hacer para ayudar a evitar que esos empleados se lastimen en el trabajo?

Commercial, Industrial

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