

NRCA Fall Committee and Roofing Alliance Meetings

The Hutton Hotel Nashville – November 7-10, 2023

Industry Executives and One Voice Breakfast



NRCA Fall Committee and Roofing Alliance Meetings

The Hutton Hotel – Nashville – November 7-10, 2023

NRCA Technical Issues



Mark S. Graham

Vice President, Technical Services

National Roofing Contractors Association

Rosemont, Illinois

NRCA Technical Services staff

Mark Graham

Vice President

Glen Clapper, AIA

Director

Maciek Rupar

Director

Nick Gallagher

Director

Kurt Fester

Project Engineer

Andrea Khalil

Program Manger

Technical Committees

2023-24 NRCA fiscal year

- Technical Operations Committee
- Manual Update Committee
 - Roof Coatings Task Force
- Sustainability Committee



The NRCA Roofing Manual—2023 Set

Consider referencing The Manual in your product literature and installation instructions



2,781 Trainers
44,297 Applicators

TRAINING
CERTA

*Consider referencing CERTA in your product literature and installation instructions.
Are your construction details CERTA compliant?*



351 companies

ROOFING GUIDELINES AND RECOMMENDATIONS

ES-1 Testing of Shop-fabricated Edge Metal

Consider referencing NRCA's ES-1 (and GT-1) sheet metal details and certification program in your product literature and installation instructions.

Roof Wind Designer

www.roofwinddesigner.com



LOGIN

HOME

CONTACT

FAQ

ROOF WIND DESIGNER

ASCE 7-05, ASCE 7-10, ASCE 7-16 AND ASCE 7-22

Usage:


- 15,688 users
- 62,766 projects

Roof Wind Designer is intended to provide users with an easy-to-use means for determining roof systems' design wind loads for many commonly encountered building types that are subject to building code compliance.

EnergyWise

energywise.nrca.net

» Log in | Register



EnergyWise Roof Calculator

Home Contact Help FAQ Log in

Welcome to EnergyWise Roof Calculator

EnergyWise Roof Calculator Online is a Web-based application that provides a graphical method of constructing roof assemblies to evaluate thermal performance and estimated energy costs under normal operating conditions.

This application also provides minimum insulation requirements as stipulated by the following codes and standards:

- International Energy Conservation Code (IECC), versions 2006, 2009, 2012, 2015, 2018, and 2021
- International Green Construction Code (IgCC), versions 2012 and 2015
- American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) Standard 90.1, "Energy Standard for Buildings Except Low-rise Residential Buildings," versions 1999 (2001), 2004, 2007, 2010, 2013, 2016, and 2019
- ASHRAE Standard 189.1, "Standard for the Design of High-Performance Green Buildings," versions 2009 and 2011

[Click here](#) for additional information about IECC, IgCC, ASHRAE 90.1 and ASHRAE 189.1


Usage:

- 5,295 users
- 12,383 projects

Related sites

- NRCA
- Professional Roofing Alliance for Progress

In partnership with





“Frankenstein” roofs

*There are currently 1,109,997 roof assembly configurations
in FM Approvals' RoofNav*

This breakdowns as follows:

- Metal panel roof systems: 2,047
- Liquid-applied membrane systems: 10,617
- BUR membrane systems: 163,334
- Single-ply membrane systems: 218,760
- MB membrane systems: 714,989

FM Approvals' RoofNav -- New Beta test version



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Approval Guide

RoofNav

Approval Standards

Customer Portal

ABOUT FM APPROVALS

PRODUCTS WE CERTIFY

ADDITIONAL CERTIFICATIONS

FM MARKS & AUDITING

CUSTOMER APPLICATIONS

STANDARDS DEVELOPMENT

PRODUCT ALERTS & NEWS / EVENTS

Home > Product Alerts & News / Events > Approved Product News > Approved Product News Recent Issues > APN Volume 39 Issue 1 > User Input Helping Drive RoofNav® Improvements

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SEPTEMBER 12, 2023

USER INPUT HELPING DRIVE ROOFNAV® IMPROVEMENTS

Beta version of RoofNav® lets users test new, intuitive capabilities and provide feedback

When long-time users of original RoofNav—FM Approvals' complimentary online roof assembly selection and project management tool—log in to the beta version of the improved system currently nearing completion, they are greeted by the welcoming message: "RoofNav Just Got Easier".

TAGS

Approved Product News, United States: Norwood, MA, Article / Document / White paper

Subscribe

APPROVAL STANDARDS

FM Approvals has developed more than 200 Approval Standards that specify the Approval criteria of various types of products and services.

[See Standards](#)

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FEATURED ITEMS

JUNE 20, 2015

[About FM Approvals](#)

JUNE 19, 2015

[Customer Applications](#)


The screenshot shows the RoofNav BETA interface. At the top, there's a search bar and a 'RoofNav BETA' header. Below the header, there are tabs for 'Filters' and 'Tools'. The 'Filters' section is expanded, showing 'Metric/US Standard' and 'Assembly Properties'. The 'Tools' section is also visible. Below the filters, there's a 'RoofNav Just Got Easier' message and a 'Quick Tips for Getting Started' section with two cards: 'Filters' and 'Tools'.

[Link](#)


^ Metric/US Standard

^ Assembly Properties


Assembly Type

Select 

Application

NEW ROOF	RE-ROOF	RE-COVER 
----------	---------	--


Cover Securement Method

ATTACHED	ADHERED	NONE 
----------	---------	--

Deck Type

Select 


Slope Operator

= >= <= Select 


Wind Uplift Operator

= >= <= Select 

Internal Fire Rating

NC	1 
----	---

External Fire Rating

A	B	C 
---	---	---

Hall Rating

SH	MH	VSH 
----	----	---

^ Roof Layers



Add Roof Layers by clicking the + where you would like the new layer to be added. Search results will be refined.

RoofNav Just Got Easier

FM Approvals welcomes you to RoofNav, your source for the latest information on FM Approved roofing assemblies and products.

To get started immediately, begin making your selections in the Filters area. You will notice your search results being parsed down as you select more attributes. If you have any questions or would like assistance completing successful searches, click on the ? icon at the top of this page.

Quick Tips for Getting Started

Filters	Tools
 <p>Filter by Assembly Properties and/or Roof Layers and your search results will update automatically.</p>	 <p>Use the Tools tab to search by Assembly Number, Manufacturer, or Product.</p>

Field wind-uplift testing

FM 1-52 and ASTM E907

Field wind-uplift testing

- ASTM E907, “Standard Test Method for Field Testing Uplift Resistance for Adhered membrane Roofing Systems”
- FM 1-52, “Field Verification of Roof Wind Uplift Resistance”





Field-uplift testing

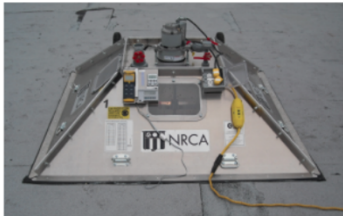
ASTM E907 and FM 1-52 tests continue to be problematic

June 2015

NRCA continues to receive a significant number of reports from roofing contractors, manufacturers and designers regarding the use of and problems associated with field-uplift tests as post-installation quality assurance measures for membrane roof systems. NRCA has addressed these testing issues a number of times during the years. Following is a summary of NRCA's previous discussions, as well as updated information and recommendations.

ASTM E907/FM 1-52

There are two recognized field test methods for determining adhered membrane roof systems' uplift resistances: ASTM E907, "Standard Test Method for Field Testing Uplift Resistance of Adhered Membrane Roofing Systems," and FM Global Loss Prevention Data Sheet 1-52 (FM 1-52), "Field Verification of Roof Wind Uplift Resistance."



An example of a test chamber used for negative-pressure uplift testing

Both test methods are similar and provide for affixing a 5- by 5-foot dome-like chamber to a roof surface's topside and applying a defined negative (uplift) pressure inside the chamber to the roof system's exterior-side surface using a vacuum pump (see photo). During the test, membrane surface deflection inside the chamber is visually monitored and measured to determine whether a roof system passes or is "suspect."

Using ASTM E907, a roof system is considered to be suspect if the deflection measured during the test is 25 mm (about 1 inch) or greater. During FM 1-52 testing, a roof system is suspect if the measured deflection is between 1/4 of an inch and 3/8 of an inch depending

on the maximum test pressure; 1 inch where a thin topping board (cover board) is used; or 2 inches where a thin cover board or flexible, mechanically attached insulation is used.

If an ASTM E907 or FM 1-52 test yields a suspect result, a test cut should be taken in the test area to determine whether failure has occurred and the specific failure mode.

ASTM E907 and FM 1-52 differ notably in their test cycles and maximum test pressures for determining roof system deflections and whether a roof system passes or is suspect. ASTM E907 testing is conducted in 15-pounds per square foot (psf) pressure intervals up to the calculated design wind (uplift) pressure for the specific roof system being evaluated. FM 1-52 testing is conducted using an initial 15-pounds psf pressure followed by 7.5-pound psf increments up to a maximum test pressure of 1.25 times the design uplift pressure for the specific roof system being evaluated.

Considering maximum test loading and allowable test deflections in combination, FM 1-52 requires 25 percent higher test loads, yet only allows as little as 1/4 the test deflection of ASTM E907. That said, FM 1-52 is a significantly more stringent test than ASTM E907.

ASTM E907 originally was published as a recognized consensus standard in 1983, and it was revised in 1996. In 2013, ASTM withdrew ASTM E907 because a consensus could not be reached regarding necessary revisions—most significantly, defining the test method's precision and bias (accuracy). ASTM E907-96 still is available for use and can be obtained directly from ASTM's website, www.astm.org.

FM 1-52 is an FM Global-promulgated evaluation method and not a recognized industry-consensus test standard. FM 1-52's scope indicates it only is intended to confirm acceptable wind-uplift resistance on completed roof systems in hurricane-prone regions, where a partial blow-off has occurred or where inferior roof system construction is suspected or known to be present.

FM 1-52 originally was published by FM Global in October 1970. The negative-pressure uplift test was added in August 1980 and has been revised several times. The current edition is dated July 2012 and includes an option for "visual construction observation (VCO)" as an alternative to negative-pressure uplift testing. VCO provides for full-time, third-party monitoring of a roof system application to verify roof system installation in accordance with contract documents.

NRCA "Industry Issue Update," June 2015 NRCA members' experience:

- Most tests not conducted in accordance with ASTM E907 or FM 1-52.
- No correlation between field test vs. lab. results/classifications
- NRCA survey: 55% passing

[Link](#)



Revisiting field uplift testing

NRCA's long-standing concerns continue with this issue

by Mark S. Graham

It has been a while since I have written about NRCA's concerns with field uplift testing, which sometimes is inappropriately used as a way to assess the quality of an adhered membrane roof system installation. Despite the time that has passed, NRCA continues to have reservations about field uplift testing, and the test procedure has not yet been revised to address NRCA's concerns.

ASTM E907

In 2013, ASTM International withdrew its consensus-based test method for field uplift testing, ASTM E907, "Standard Test Method for Field Testing Uplift Resistance of Adhered Membrane Roofing Systems."

ASTM International requires its test method standards to include a precision statement addressing two things:

- Known within-laboratory variability, referred to as "repeatability"
- Relative variability of test results obtained from different laboratories, referred to as "reproducibility"

Test methods also are required to include an estimate of bias in test results.

Professional Roofing December/January 2022-23

[Link](#)

ASTM Interlaboratory study (ILS)

“Testing the test”

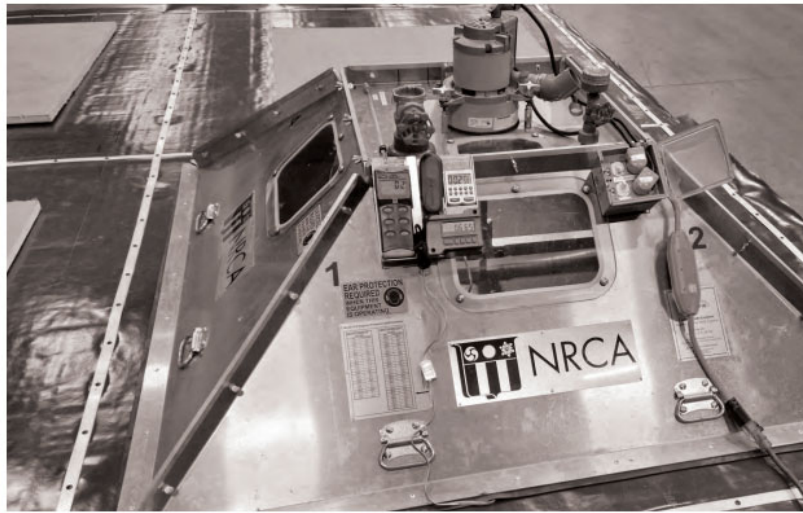
- Built three identical test decks allowing for 24 tests total
- FM Class 90 roof system (FM tested to 90 psf)
- 8 testing entities conducted 3 test each
- Each test run at 15 psf increments up to 90 psf classification
- Membrane deflection is measured
- ASTM ILS staff planned the study and analyzed the test results
- At FM Global’s research center in Glocester, RI

ILS results

“Testing the test”

- Statistical outliers 15-, 30-, 45-, 60- and 90-psf test increments
- Outlier data excluded at 30-, 45- and 90-psf test increments
- 16 of the 24 specimens exhibited failure before completing the 90-psf test increment.
- 5 results at the 45-psf increment and all the tests' results at 60, 75- and 90-psf test increments exceeded FM 1-52's maximum allowable deflection.

All specimens should have exceeded 90 psf



Putting the test to the test

Substantial variability has been found in field-uplift testing

by Mark S. Graham

NRCA participated in an ASTM International interlaboratory study to evaluate the accuracy and precision of the field-uplift test method. The study provides some useful data and information for evaluating the appropriateness and effectiveness of field-uplift testing.

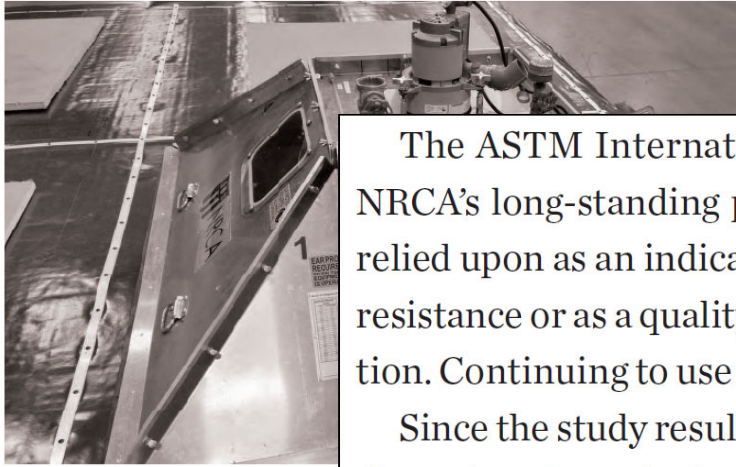
Field-uplift testing

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ASTM E907 has been a consensus-based standard since it was originally published in 1983. ASTM International withdrew the standard in 2013 because it lacked a precision statement, which is required for all ASTM International test methods.

Professional Roofing September 2023

[Link](#)



Putting the test to the test

Substantial variability has been found in field-uplift testing

by Mark S. Graham

The ASTM International interlaboratory study clearly illustrates NRCA's long-standing position that field-uplift testing should not be relied upon as an indicator of an adhered roof assembly's in situ uplift resistance or as a quality-assurance measure of roof assembly installation. Continuing to use it as such is irresponsible.

Since the study results were released, NRCA's Technical Operations Committee has asked FM Global to immediately discontinue use of FM 1-52's field-uplift test as a quality-assurance measure for roof assembly installation. 

Test Method for Field Testing Uplift Resistance of Adhered Membrane Roofing Systems," and FM Global Loss Prevention Data Sheet 1-52 (FM 1-52), "Field Verification of Roof Wind Uplift Resistance." In each of these test methods, a vacuum is created inside a test chamber mounted on a roof surface and membrane deflections resulting from the induced negative (uplift) pressures inside the chamber are measured.

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[Link](#)

Radio frequency radiation

Rooftop cell phone transmitters

Rooftop cell phone transmitters



Radiofrequency Radiation and Electromagnetic Fields

The increased number of cellular antennas and other communication equipment that generates radiofrequency radiation (RF) and electromagnetic fields (EMF) may be exposing roofers and other contractors to harmful levels of radiations when working on rooftops, sides of buildings and other locations where RF generating antennas are located. This bulletin will focus on radiation types, safety limits and mitigating exposure.

With the ever-increasing use and development of communication technology, there is an increased risk for those working in and around communication devices and equipment that emit radiofrequency electromagnetic fields (EMF) such as smart meters, cell phone towers and equipment using 5G technology. Roof areas are often prime locations for this type of equipment and anyone accessing these roof areas for any reason should be aware of the Occupational Health and Safety requirements and the Safety Code 6. Consult with provincial and/or federal authorities having jurisdiction for further information/guidance for most stringent requirements.

What is Radiofrequency (RF) Radiation?

There are two types of radiation – ionizing radiation and non-ionizing radiation. Both are forms of electromagnetic energy, but ionizing radiation has more energy than non-ionizing radiation. Ionizing radiation, like x-rays or gamma rays, has enough energy to cause chemical changes by breaking chemical bonds. Sources of this type of radiation can be found in hospitals, nuclear energy plants, and nuclear weapons facilities. Non-ionizing radiation causes molecules to vibrate, which generates heat. RF radiation is a type of non-ionizing radiation and is the energy used to transmit wireless information. RF radiation is invisible and power levels of equipment and amount of RF radiation can fluctuate without warning.

About Safety Code 6

Health Canada publishes Safety Code 6¹ which sets out recommended safety limits for human exposure to radiofrequency electromagnetic fields (EMF) in the frequency range from 3 kHz to 300 GHz. This range covers the frequencies used by communications devices and equipment that emit radiofrequency EMF such as: Wi-Fi, cell phones, smart meters, cell phone towers, those using 5G technology.

Safety Code 6 is reviewed on a regular basis to confirm that it continues to provide protection against all known potentially adverse health effects. If new scientific evidence were to show that exposure to radiofrequency EMF below the levels found in Safety Code 6 poses a risk, the Government of Canada would take steps to protect the health of Canadians.

¹ <https://www.canada.ca/en/health-canada/services/health-risks-safety/radiation/occupational-exposure-regulations/safety-code-6-radiofrequency-exposure-guidelines.html>

CRCA Advisory Bulletin

June 2023

[Link](#)



How protect yourself from RF radiation

The risks associated with RF radiation increases with the number of devices present, the closer a worker is to the equipment/device(s), and the more time that is spent in the area. Workers can protect themselves by the following:

How protect yourself from RF radiation

The risks associated with RF radiation increases with the number of devices present, the closer a worker is to the equipment/device(s), and the more time that is spent in the area. Workers can protect themselves by the following:

- Complete a visual assessment of the area to determine if cellular antennas or other RF radiation generating antennas are present. If you are not sure, ask your supervisor, the building owner, or the property manager if RF-generating antennas are present where you need to work. The building owner or property manager should have the information, or know whom to contact for information about antennas, their locations, and the RF radiation levels.
- Look for warning signs posted near RF antennas; the signs should identify the hazard and tell you where to get more information.
- Contact the building owner/manager and the antenna licensee to have the equipment temporarily powered down or moved.

The opinions expressed herein are those of the CRCA National Technical Committee. This Advisory Bulletin is circulated for the purpose of bringing roofing information to the attention of the reader. The data, commentary, opinions and conclusions, if any, are not intended to provide the reader with conclusive technical advice and the reader should not act only on the roofing information contained in this Advisory Bulletin without seeking specific professional, engineering or architectural advice. Neither the CRCA nor any of its officers, directors, members or employees assumes any responsibility for any of the roofing information contained herein or the consequences of any interpretation which the reader may take from such information.

Recognize the signage



Photos courtesy of Peter Shackford—Hetrick, Cyr & Associates, Inc.



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- Look for warning signs posted near RF antennas; the signs should identify the hazard and tell you where to get more information.
- Contact the building owner/manager and the antenna licensee to have the equipment temporarily powered down or moved.

If work needs to be performed within a potentially hazardous area:

- Check the site survey or roof plan for potential exposure levels
- Pre-plan work tasks and travel routes so you can limit trips through the RF field and time spent on tasks there – the goal is to get in and out as quickly as possible.
- Avoid standing directly in front of or close to an antenna. As a rule of thumb, stay 1.5 m (6 feet) away from a single antenna and 3 m (10 feet) away from a group of antennas.
- Use a personal RF monitor. The monitor will warn you if you are in an area where RF radiation is at a dangerous level. There are several handheld EMF personal safety monitors available on the market that measure exposure and allow workers to work in an exposed area for a limited time. Use personal monitors and protective clothing while work is being performed and if an alarm sounds, stop work and leave the area immediately.

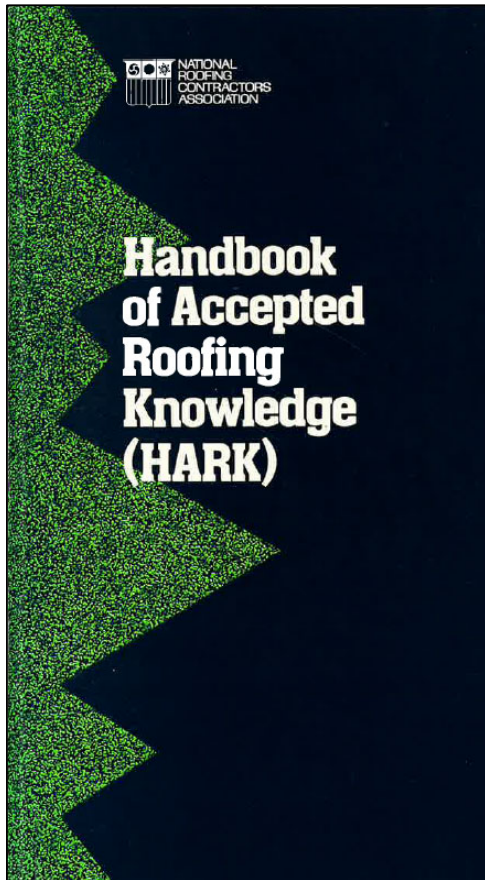
no employee assumes any responsibility for any of the foregoing information contained herein or the consequences or any interpretation which the reader may take from such information.

Some useful references

- CRCA Advisory Bulletin ([Link](#))
- Health Canada's Safety Code 6 ([Link](#))
- Federal Communications Commission ([Link](#))
- Center for Construction Research and Training ([Link](#))

Nighttime tie-in and night seal considerations





XXI. WATER CUTOFFS AND WEATHER PROTECTION

Water cutoffs are temporary felt courses that are installed to prevent moisture from entering the insulation and membrane during construction. They should be applied at the end of each day's work and whenever work is halted for an indefinite period to protect the membrane from precipitation. They must be removed prior to installing additional insulation.

Temporary flashings should be installed as weather protection if permanent flashings are not in place. All openings in the membrane should be sealed to prevent any moisture from entering the roof system before completing membrane application.

Specifications requiring gravel installation each day are unrealistic and sometimes detrimental to the quality of the completed roof. Where working conditions permit, roofing felts should be "glazed" and sealed at the end of each day's work if final surfacing is not installed.

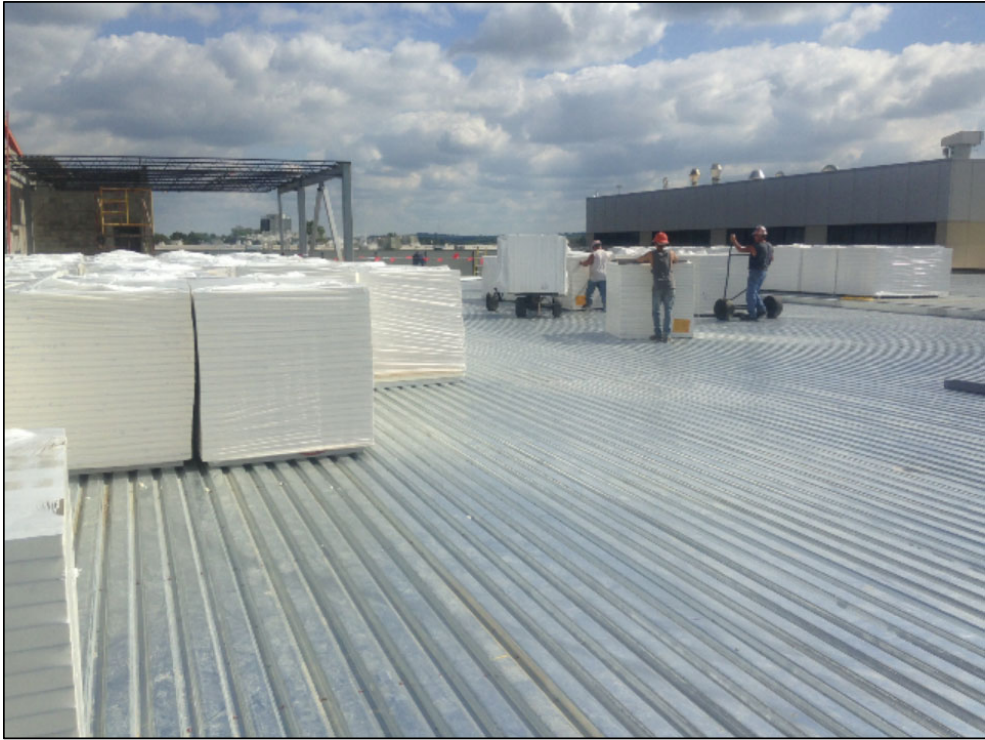
*With single-ply membrane systems, nighttime tie-ins
and night seals have gotten more difficult...*

Some considerations

Nighttime tie-ins and night seals

- Project specific planning...
- Get back to the basics...
 - Water cut-off
 - Night seals
- SA underlayment and base sheet products can work well for cut-offs

Concepts to share?



Roof deck loading
considerations

University of Massachusetts – Amherst

Draft report: “Roof Live Loads for Low-Slope Roofs”

Joint research

Metal Building Manufacturers Association

National Roofing Contractors Association

Steel Deck Institute

Some examples of roof loading

- Pallet of asphalt shingles (42 bundles): 2,500 to 4,200 lbs.
- Pallet of TPO membrane rolls: 1,400 to 3,450 lbs.
- Pallet of MB cap sheet (20 rolls): About 2,500 lbs.
- Pallet of glass-faced gypsum board (4 x 4): 1,600 to 2,400 lbs.
- Pallet of bonding adhesive (45 pails): 1,800 lbs.
- Bundle of polyiso. (4 x 8): 250 to 500 lbs.

Some initial considerations

Roof deck loading concerns

- Roofing operations may exceed live load capacity
- Note joist/framing orientation
- Consider avoiding adjacent load placement
- Position loads across joists/framing
- Consider added dunnage across framing
- Also consider rooftop equipment weight

***I encourage your company to engage with NRCA
at a greater level...***



Mark S. Graham

Vice President, Technical Services
National Roofing Contractors Association
10255 West Higgins Road, 600
Rosemont, Illinois 60018-5607

(847) 299-9070
mgraham@nrca.net
www.nrca.net

Personal website: www.MarkGrahamNRCA.com

LinkedIn: [linkedin.com/in/markgrahamnrca](https://www.linkedin.com/in/markgrahamnrca)