

CRSMCA
Myrtle Beach, South Carolina
June 26-30, 2024

Roofing Industry Issues Update

presented by

Mark S. Graham

Vice President, Technical Services
National Roofing Contractors Association (NRCA)



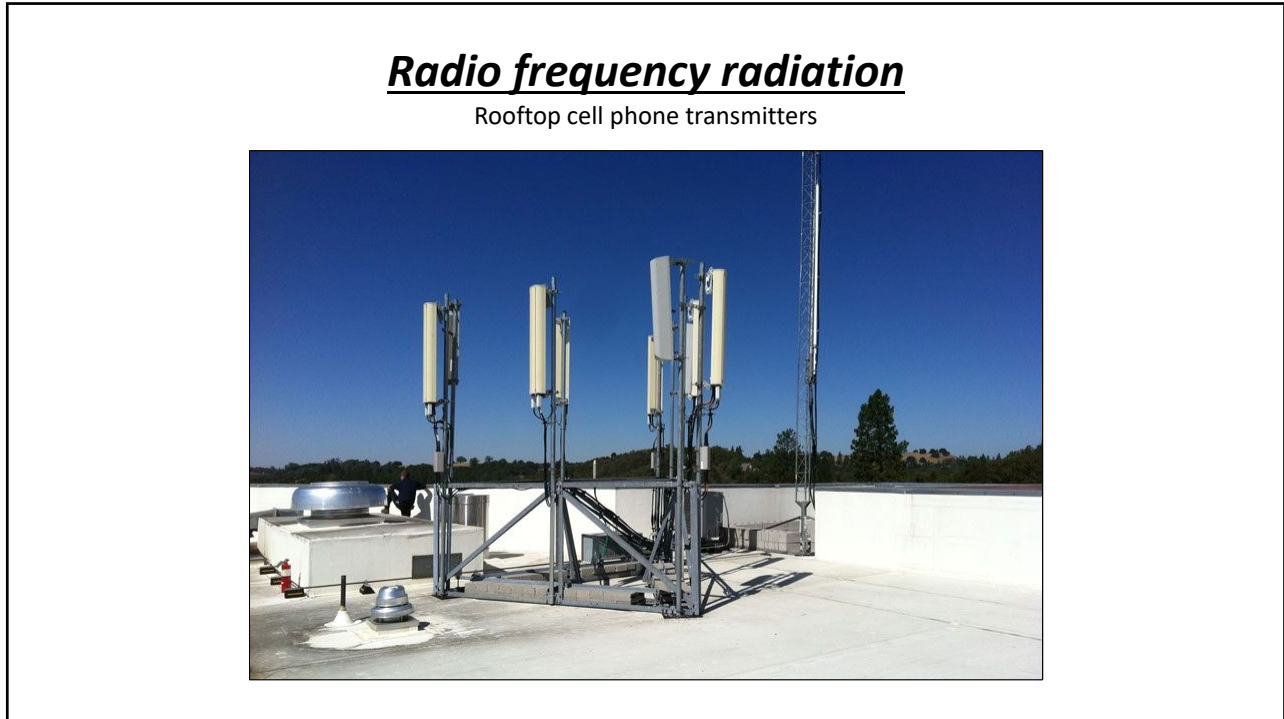
1



2

3

4



Radio frequency radiation

Rooftop cell phone transmitters

5

CRCA Advisory Bulletin

June 2023

[Link](#)

6

CRCA
Construction Roofing Contractors Association

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.

2

7

Recognize the signage

The image displays four safety signs:

- Property of AT&T Authorized Personnel Only:** A white sign with blue and orange accents. It includes the text: "Property of AT&T Authorized Personnel Only", "No Trespassing Violators will be Prosecuted", and "In case of emergency, or prior to maintenance on this site, call 800-955-1817 and reference cell site number".
- NOTICE:** A blue sign with a white border. It features a black icon of a radio tower with signal waves. The text reads: "Radio frequency fields beyond this point may exceed the FCC general public exposure limits. Obey all posted signs and site guidelines for working in radio frequency environments. In accordance with Federal Communications Commission rules on radio frequency emissions 47 CFR 1.1307(b)".
- CAUTION:** A yellow sign with a black border. It features a black icon of a radio tower with signal waves inside a yellow triangle. The text reads: "Beyond this point: Radio-frequency fields at this site may exceed FCC rules for human exposure. For your safety, obey all posted signs and site guidelines for working in radio frequency environments. In accordance with Federal Communications Commission rules on radio frequency emissions 47 CFR 1.1307(b)".
- WARNING:** An orange sign with a black border. It features a black icon of a radio tower with signal waves inside an orange triangle. The text reads: "Beyond this point: Radio frequency fields at this site exceed the FCC rules for human exposure. Failure to obey all posted signs and site guidelines for working in radio frequency environments could result in serious injury. In accordance with Federal Communications Commission rules on radio frequency emissions 47 CFR 1.1307(b)".

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

8

The screenshot shows a document from the CRCA (Construction Radiation Control Association). At the top center is the CRCA logo. Below it is the heading "How protect yourself from RF radiation" followed by a paragraph: "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:". This is followed by a bulleted list of three items. A white callout box is overlaid on the page, containing the text "If work needs to be performed within a potentially hazardous area:" followed by a bulleted list of four safety instructions. At the bottom of the page, there is a small disclaimer: "The reader may take from such information." and a page number "2".

CRCA

How protect yourself from RF radiation
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- 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.

The reader may take from such information.

2

9

The screenshot shows a vertical blue banner. At the top left is the NRCA logo (a stylized 'N' with 'NRCA' next to it). To the right of the logo is the text "TOOLBOXTALKS" in a bold, white, sans-serif font. At the bottom of the banner, the text "National Roofing Contractors Association" is written in a smaller white font. In the bottom right corner of the banner, there is a small blue "Link" icon.

NRCA | **TOOLBOXTALKS**

National Roofing Contractors Association

Link

10

TOOLBOX TALKS

Radio frequency (RF) hazards

According to the Federal Communications Commission (FCC), radio waves and microwaves emitted by transmitting antennae are one form of electromagnetic energy that harm people. Harm from RF exposure will vary according to power levels, length of exposure time and distance from the antennae. Sources of RF energy on a rooftop often are not obvious and usually are not properly marked or defined as danger zones by warning signs. In many cases, antennae are hidden by building elements so workers may not be aware of their presence. Here are some important facts about RF energy and things that you can do to avoid it:

- High levels of RF may heat body tissue and increase body temperature, causing tissue damage because the body cannot cool quickly enough to prevent damage. This is called RF's thermal effects, and your eyes are the most vulnerable part of your body. Actual contact may cause a shock or burn.
- At lower, nonthermal levels of RF exposure, nervous system and immune system problems, kidney damage, neurological disorders and even some cancers may occur.
- Become familiar with what RF transmitters or antennae look like and the dangers of working near them. Be aware that warning signs for RF transmitters may not always be present on a roof.
- Your employer must inquire as to the presence of RF equipment and whether it may be shut down or shielded or other barrier devices installed for the duration of the work period roofing workers will be in proximity to the transmitter.
- Symptoms of RF exposure often seem the same as physical exertion and can become heat exhaustion or heat stroke. Removing a worker from the area and cooling the body is important. Trained, professional medical care of the symptoms is critical.

National Roofing Contractors Association
TOOLBOX TALKS
www.nrca.net
219


11

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](#))

12

RESEARCH+TECH



Plywood or OSB?
Moisture-related concerns exist with wood structural panels
by Mark S. Graham

NBCA's technical services staff continues to hear from roofing contractors experiencing moisture-related dimensional stability problems with plywood and oriented strand board structural panel sheathing used with steep-slope roof systems. Following is a brief discussion of moisture mechanics, linear expansion and thickness swell testing, and NBCA's recommendations for plywood and OSB structural panel sheathing roof decks.

Moisture mechanics
Plywood and OSB sheathing, similar to all wood products, are hygroscopic, meaning they tend to absorb and release moisture from their surroundings.
When not exposed to direct wetting, structural panel sheathing's moisture content is a function of its environment's relative humidity and temperature. During construction and its service life, panels may be exposed to direct moisture. When exposed to direct wetting, structural panel sheathing's moisture content is influenced by wetting time and panel variables that affect capillarity, such as veneer species of plywood and wax additives in OSB.

24 professionalroofing.net APRIL 2021

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[Link](#)

13

Standards for wood structural panels

International Residential Code, 2021 Edition

Plywood:

- U.S. Department of Commerce PS-1, "Structural Plywood"
- CSA Group O325, "Construction Sheathing"

Oriented-strand board (OSB):

- U.S. Department of Commerce PS-2, "Performance Standard for Wood-based Structural-use Panels"
- CSA Group O437, "Standards for OSB and Waferboard"

14

Common, but not referenced in the Code

Plywood and OSB:

- APA-The Engineered Wood Association Standard PRP-108, “Performance Standards and Policies for Structural-Use Panels”

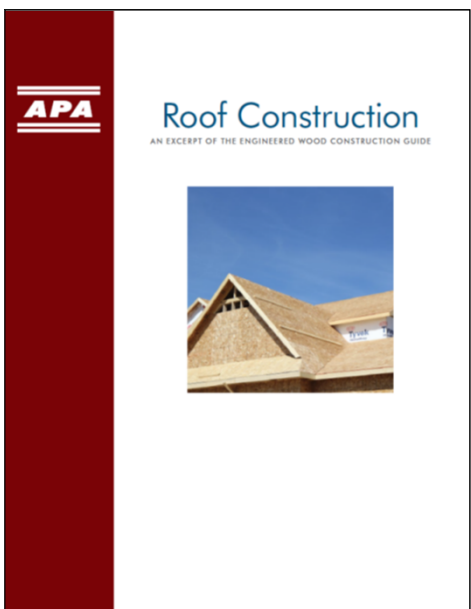
15

Attachment of Wood Panels: The *International Residential Code, 2024 Edition's* Table R602.3(1)-Fastening Schedule provides minimum fastener and fastener spacing requirements for wood structural panels into roof framing shown in Figure 6.1.

Item	Description of building elements	Number and type of fasteners	Spacing of fasteners	
			Edges (inches)	Intermediate supports (inches)
Wood structural panels, roof sheathing to framing and particle board wall sheathing to framing				
31	3/8- to 1/2-inch-thick	6d common or deformed nail (2" x 0.113" x 0.281" head)	6	6
		8d common nail (2 1/2" x 0.131" x 0.281" head), or RSRS-01 nail (2 3/8" x 0.113" x 0.281" head)	6	6
32	19/32- to 3/4-inch thick	8d common nail (2 1/2" x 0.131" x 0.281" head), or RSRS-01 nail (2 3/8" x 0.113" x 0.281" head)	6	6
33	7/8- to 1 1/4-inch thick	10d common nail (3" x 0.148" x 0.281" head), or 2 1/2" x 0.131" x 0.281" head deformed nail	6	12

Figure 6-1. Roof sheathing-specific excerpt from *International Residential Code, 2024 Edition's* Table R602.3(1)-Fastening Schedule

16




APA Form E30, “Roof Construction”

--Roofing-specific excerpts from
APA’s *Engineered Wood Construction Guide* (102 pages)

[Link](#)

17



2024 IIBEC Convention Proceedings

March 8-11, 2024

[Link](#)

18

Considerations

Lumber, plywood and OSB

- Be extra cautious of plywood and OSB roof decks
- Limit your deck acceptance responsibilities
- Consider more proactive plywood and OSB deck replacement
- Consider pull tests for plywood and OSB roof decks when using mechanically-attached membrane systems

19



Nailbase insulation considerations

20

Nailbase insulation considerations

- Double layer design and application
- Taped joints can control vapor leaks/underlayment wrinkling at board joints
- Pressure-tested and FRT nailbase are not good ideas for nailbase

21



Roof deck loading considerations

22

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.

23

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

24

“Moisture” meter concerns



25

*These meters do not read moisture...
...they read relative conductivity, which can be correlated
to specific materials in specific conditions when properly
calibrated.*

26

Considerations

“Moisture” meters

- Read/understand the instruction manual
- Understand device sensitivity
- Understand proper operating conditions
- Proper calibration/recalibration is critical
- Don't overstate the meter's capability
- Verify job-specific results with gravimetric analysis

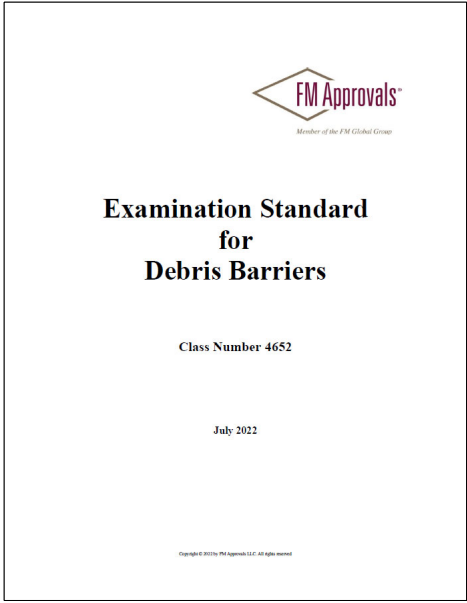
27



Photo courtesy of TuffWrap Inc.

Interior debris protection systems during reroofing

28



FM Approvals
Member of the FM Global Group

**Examination Standard
for
Debris Barriers**

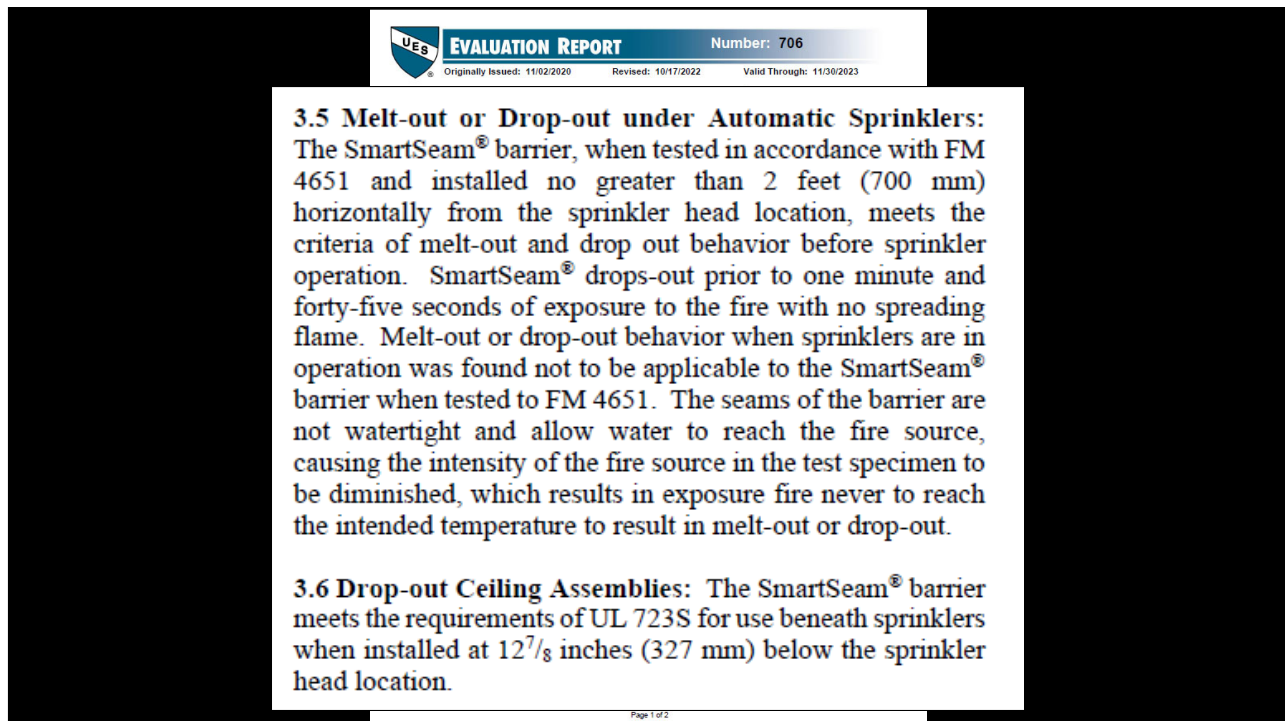
Class Number 4652

July 2022

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FM 4652, “Examination Standard for Debris Barriers”

29



UL EVALUATION REPORT Number: 706
Originally Issued: 11/02/2020 Revised: 10/17/2022 Valid Through: 11/30/2023

3.5 Melt-out or Drop-out under Automatic Sprinklers: The SmartSeam® barrier, when tested in accordance with FM 4651 and installed no greater than 2 feet (700 mm) horizontally from the sprinkler head location, meets the criteria of melt-out and drop out behavior before sprinkler operation. SmartSeam® drops-out prior to one minute and forty-five seconds of exposure to the fire with no spreading flame. Melt-out or drop-out behavior when sprinklers are in operation was found not to be applicable to the SmartSeam® barrier when tested to FM 4651. The seams of the barrier are not watertight and allow water to reach the fire source, causing the intensity of the fire source in the test specimen to be diminished, which results in exposure fire never to reach the intended temperature to result in melt-out or drop-out.

3.6 Drop-out Ceiling Assemblies: The SmartSeam® barrier meets the requirements of UL 723S for use beneath sprinklers when installed at 12⁷/₈ inches (327 mm) below the sprinkler head location.

Page 1 of 2

30

Preliminary considerations

Interior debris protection systems during reroofing

- Be knowledgeable... ask questions
- Seek out code “acceptance” information from the supplier
- An Evaluation Report is useful documentation
- More suppliers are applying for FM 4652 approval
- Contact NRCA

31

Questions... other topics

32



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

Twitter: @MarkGrahamNRCA
Personal website: www.MarkGrahamNRCA.com