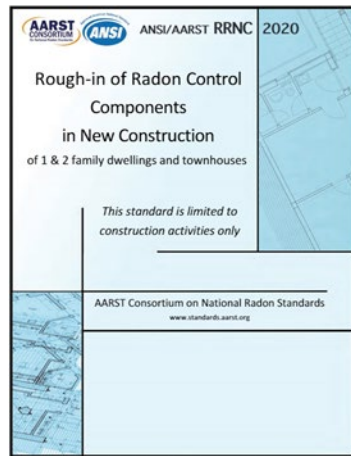
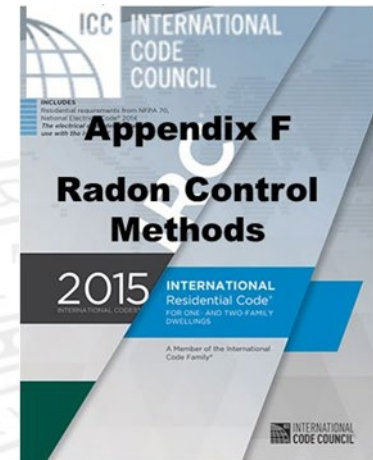
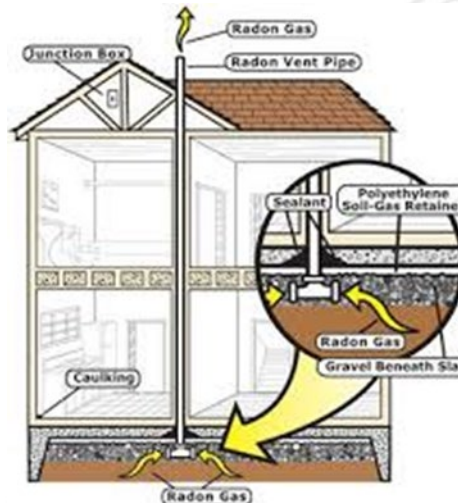


# Radon Resistant Building Codes Resources and Action Planning for Radon Programs



Two Webinars  
May 28, 2020  
June 11, 2020



# Introduction and Welcome



National Radon Program Services at Kansas State University, under its cooperative agreement with EPA, will be conducting two 1-hour webinars focused on helping radon programs evaluate and potentially engage in radon resistant building code adoption and implementation efforts – thanks to all our speakers!

Please use the chat box to type your name, and post any questions!



# Purpose of the Webinars

## Ryder Freed – US EPA Region 9

- Address key questions program administrators need to know to understand the code adoption process.
- Identify necessary resources and partners.
- Build on lessons learned to guide development of program specific plans and action steps.

# Review of Preparation Materials and Resources

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Where is radon addressed in current building codes?

What are the basic elements of RRNC in Appendix F?

What was added to Appendix F in 2020?

Which AARST-ANSI Building Standards address RRNC?

How are building codes/RRNC adopted?

Are building codes/RRNC adopted differently on Tribal lands?

<https://sosradon.org/Resources-for-RRNC-Code-Adoption>

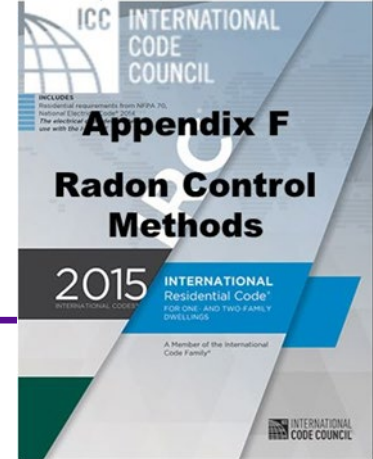


# Webinar #1 Review

## Radon Resistant Building Codes - Background and Case Studies



# IRC Appendix F: Section 103 Requirements (Overview)

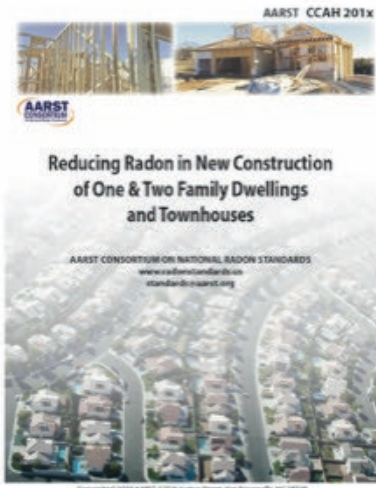


1. General
2. Subfloor Preparation
3. Soil-Gas Retarder
4. Entry Routes
5. Passive Submembrane Depressurization (PSD) Systems: Crawlspace
6. PSD Systems: Basements and Crawlspace
7. Vent Pipe Drainage
8. Vent Pipe Access
9. Vent Pipe Identification
10. Combination Foundations
11. Building Depressurization
12. Power Source

# AF104 Testing. Where radon-resistant construction is required, radon testing shall be as specified in Items 1 through 11: (added this year)

## 1. Testing shall be performed ..

- after the dwelling passes its air tightness test
- and HVAC installations are complete
- different HVAC systems shall be tested separately
- under closed house conditions
- by builder, design professional, approved 3<sup>rd</sup> party
- not less than 48 hours
- results less than 4pCi/L shall be provided to code official.
- where result is 4 pCi/L or + fan shall be installed
- where result is 4 pCi/L or + system modified until less than 4 pCi/L.



# AARST-ANSI New Construction Standards Overview

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## Construction Code Applicable To Houses - CCAH- 2020 Changes

- No Limit on Foundation Size
- Testing Within 60 Days of Occupancy
- Fan Sizing to be Performed by Radon Professional
- Active System Monitors Required
- Numerous Small Changes and Clarifications
- Performance Path Provided (Test <4pCi/L)
- Option for Conditioned Attics
- Fan Access Requirements Increased to 30 Feet





# AARST-ANSI New Construction Standards Overview

## RRNC (Radon Resistant New Construction) - 2020

- Similar to ICC Appendix F *“Radon Control Methods”*
- Requires Rough-in of ASD System
- No Testing Required (For Now)
- Performance Option for Testing less than 4 pCi/L

# Code adoption process and partners

## Process - ICC

- Building Codes Updated every 3 years
- Code Change Proposals Submitted
- Committee Hearings
- Public Comment (Modify Initial Proposal)
- Final Action Hearings (In Room Code Officials)
- Online Voting

## Partners

- Industry (AARST)
- State Radon Officials
- American Lung Association
- Consumer Advocates
- Lung Cancer Advocacy Groups (CanSAR, CRRR)
- Code Officials
- Builders

# Case Studies in Code Adoption

## Five Minute Summaries

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- Jurisdictions
- State code status
- Time to accomplish
- Key participants
- Key actions/decisions
- Current status
- Lessons learned

# Case Studies – Key Points

- Minnesota - Statewide code adoption, took years up until 2015, legislation was passed,  
**TIP:** engage opponents with facts
- Nebraska – Statewide code adoption, completed in 2019, used a statewide task force to form legislation, requires local enforcement, legislation was passed, regulations are now under review,  
**TIP:** be prepared to conduct education for state/county/city code folks



# Case Studies – Key Points

- Kansas – Home rule code adoption, currently 8 cities/2 counties adopted,  
**TIP:** be prepared with training and technical assistance, installed system performance evaluations
- Missouri - Home rule code adoption, outreach to code officials in the state encouraging adoption of Appendix F, realtor training,  
**TIP:** conduct data review
- Georgia – Home rule code adoption, 1 county adopted, Appendix F impractical/costly given construction techniques,  
**TIP:** be aware of installation fail issues and how that can impact on the ground installation

# Jane Malone – AARST Policy Director

Jane joined the AARST staff in 2015 to help advance federal, state and local policies that will reduce radon risk.



# Trends - RRNC Adoptions

- Required by 11 states (CT IL ME MA MD MI MN NJ OR WA) and more than 100 localities in other states
  - How many localities in your state?
- Geographic scope
  - All counties (CT IL ME MN)
  - Zone 1 counties (MA MD MI NJ OR WA)
  - Counties with radon average equal to/above 2.7 pCi/L (NE)
- Type of Occupancy
  - One- and two- family (CT ME MA MI MD; most localities)
  - 1 & 2 family plus apartment buildings (OR)
  - All residential buildings (IL NJ MN NE WA)
- Exceptions: (1) Architect- or PE-designed home exempt; (2) builder can convert to active system, mitigator must test (NE)



# Trends – Which Version of RRNC?

1. Added to code / policy as a state-wide requirement
  - Appendix F as is: MD MI WA
  - Appendix F or ANSI-AARST CCAH: MA
  - Amended Appendix F: CT IL NE MA MN OR
  - ASTM 1465-08: ME (JD > 4,000)
  - Original text: NJ
2. Non-mandatory state-wide approaches
  - Local jurisdictions must use Appendix F if adopting RRNC:  
FL VA
3. Local adoption – typically Appendix F (exc: Wayne Co OH)
4. ANSI-AARST CC-1000, ANSI-AARST CCAH
  - HUD requires ANSI-AARST CC-1000 / CCAH





# Two Interpretations of Appendix F

REQUIREMENT	ILLINOIS TASK FORCE	NEBRASKA LAW
Definitions	Included	Did not include
Reference document	Appendix F	Appendix F
Subfloor preparation	Yes	No
Soil gas retarder	Yes	No
Entry routes	Yes	No
Floor openings	Yes	No
Concrete (cold joints)	Yes	No
Condensate drains	Yes	No
Foundation walls	Yes	No
Damp proofing	Yes	No
Air handling units	Yes	No
Ducts	Yes	No
Crawl space floors	Yes	No
Crawl space access	Yes	No
Crawl space depressurization	Yes	No
Sub slab depressurization	Included	Included
Vent pipe	Included	Included (similar)
Multiple vent pipes	Included	Included
Vent pipe drainage	Yes	No
Vent pipe accessibility	Yes	No
Vent pipe identification	Included	Included
Power source	Yes	Yes

(source ALA UMW)

# Gaining RRNC in the Building Code

- The existing code system is the primary policy target
- Code officials implement and influence the codes
  - State radon programs can educate, regulator-to-regulator
    - Inter- / Intragovernmental education is not lobbying
    - Some will be interested in how to inspect: forward a checklist
  - Elected officials can enact requirement in some cases
    - RRNC is a good topic for NRAM... revenue-neutral policy
- Home builder groups often resist new requirements
  - But builders are including RRNC – 25% of Zone 2 homes have it
  - Builders are allies for RRNC done right – they don't want call-backs
  - Outreach opportunities – builders expo, CE, recognition



# ANSI-AARST RRNC – Visual Review Form

Reviewed	Verification of component completion	
	Component	Corrected
<input type="checkbox"/> 1)	All openings to soil in concrete slabs and membranes are closed to achieve a continuous air barrier that restricts air movement between soil gas and indoor air.	
	<b>Sub-membrane Depressurization</b>	
	<input type="checkbox"/> The tops and sides of the soil gas retarder(s) are sealed	
	<input type="checkbox"/> Penetrations through the membrane(s) are sealed	
	<b>Sub-Slab Depressurization</b>	
	<input type="checkbox"/> Penetrations through the slab(s) are sealed	
	<input type="checkbox"/> Block-outs or openings cast or constructed in the concrete slab, such as for under plumbing fixtures, are sealed	
	<input type="checkbox"/> Accessible floor to wall joints are sealed	
	<b>General</b>	
	<input type="checkbox"/> Sumps are closed with a rigid lid and the lid is sealed	
	<input type="checkbox"/> Openings and penetrations in hollow block masonry walls are sealed	
<input type="checkbox"/> 2)	Circuit conductors are configured for continuous activation that terminate in a receptacle outlet located within 6 feet [1.8 m] of the potential ASD fan location	
<input type="checkbox"/> 3)	Potential fan location exists that is viable for fan installation with the fan and positively pressured system piping not located inside conditioned or occupiable space	
<input type="checkbox"/> 4)	System piping extends from within the gas permeable layer(s) to above the roof and is sloped to drain water to the suction point(s)	

(ANSI-AARST CCAH also has an inspection list)



# RRNC Adoption Mechanisms

- ICC Appendix = the default approach
  - Propose ANSI-AARST RRNC as an option
- State-level adoption
  - Building Code Council/Board Decision?
  - Legislation-Driven Task Force?
  - Legislation?
- Local Adoption - county, municipality
  - Planning Commission / Code Board?
  - Council/Mayor?





# Dallas Jones

is the Executive Director for the American Association of Radon Scientists & Technologists and National Radon Proficiency Program.



# Engaging with Radon Professionals

- Chapters, leaders in states w/o chapters
- Viewpoints vary
  - Preference for ANSI-AARST Standards



# Craig Conner

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serves on the development committee for the National Green Building Standard (NGBS) and NAHB's Energy and Green Building Subcommittees.

# Connecting to Code Officials

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Code staff want:

- Simple
- Clear
- Common sense
- Will not read complex docs
- Home builders want same

# Yea for Testing

- Radon testing required in newest IRC Appendix F
- Propose jurisdiction amend earlier IRC App F with testing?
- Propose testing language in new Appendix F



# Work within jurisdiction code making process

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- Know adoption schedule and steps
- Attend meetings
- Talk at meetings
- Make personal contact
- Think multi year

# IRC Hearing – 10/2019

Video of testimony in support of adding testing to Appendix F  
<http://hearingvideos.iccsafe.org/videos/rb289-19-2/>



National

YEAR

2019

GROUP

2019 Group B

COMMITTEE

IRC – Building

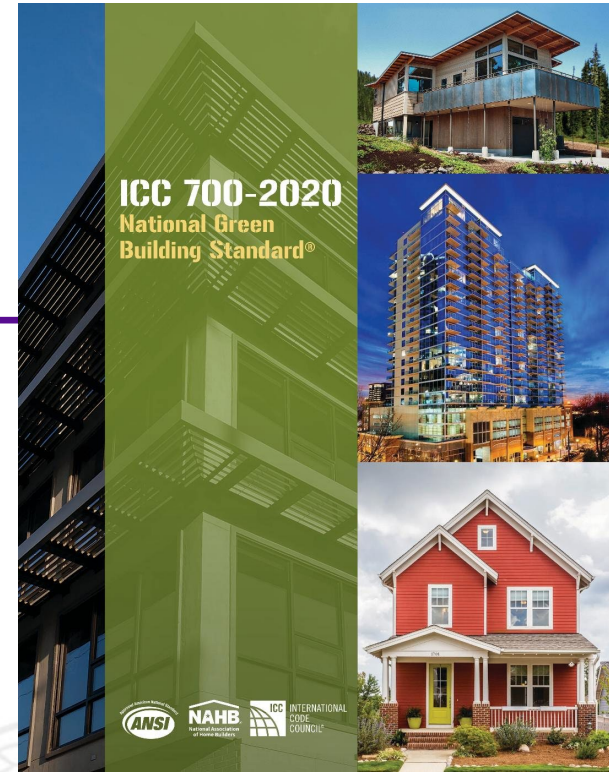
VIEWING

CAH

PCH

# Another Option

- National Green Building Standard
- ANSI approved, Feb 2020
- Requires RRNC and testing in Zone 1
- NGBS program near you?
- NGBS gives locals experience with radon - easier to get RRNC & testing if non-regulatory



# Bruce Snead

is Director of Engineering Extension at Kansas State University (KSU) and has been a state extension specialist in residential energy, radon and indoor air quality since 1982.

# Engaging with Decision Makers

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- What is the schedule for code adoption?
- What are the opportunities for input?
- Who is the adopting authority(s)?
- Who will actually vote on a proposal?



# Engaging with Decision Makers

- Can you find a champion/advocate?
- Strategically positioned to play a role?
- Do they have any experience with radon?  
Tested? Fixed? Lung cancer survivor?
- *These can be the most compelling advocates in a public setting*

# Engaging with Decision Makers

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## Local Level

Code Officials

Building Code Committee?

City Council/Commission/Mayor- contact yours

City Manager/Department Heads

Builders Association – Director/President

Contractors – radon/foundation/plumbing

Developers

# Engaging with Decision Makers

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## State Level

Legislators – contact yours

Legislative research/staff – who writes bills

Legislative Committee – chair – schedules

State agency staff – PI officer/legislative liaison – key filters for testimony

Governor – NRAM - proclamation

# Engaging with Decision Makers

- What are the opportunities to educate these stakeholders?
- Annual conferences – education day at the capitol – code official association meetings/CE offerings
- Technical assistance on RRNC components and performance
- Access to resources – reports/case studies from similar jurisdictions or from local sources –
- Radon data in county/city/state – critical item
- Training for code officials – EPA past example
- Sosradon.org resources

# Achieving Code Adoption

- Be ready to respond to opportunity?
- Publicity opportunities?
- RRNC/radon coverage in the region?  
Successes? Failures?
- Finding advocates – builders who are doing it
- Time frame for being engaged – long term? multiple years – legislative sessions



# Achieving Code Adoption

- Have a goal – what would be the ideal action that could occur?
- What would be a minimum action that would make the effort worthwhile?
- What are critical items that must be included?
- What items are you willing to let go or compromise on?

# Achieving Code Adoption

- Evaluating options, considering compromise...
  - **All buildings, no exceptions, or:**
    - Zone 1 only? (NE above 2.7 pCi/L only?)
    - Residential only?
      - Single and Two-Family only?
  - **Current Standards (ANSI-AARST CCAH CC-1000) or**
    - Appendix F? Modify it?
    - Options – Appendix OR the standards
    - State-allowed template?



# Poll Question

*How likely is it that you will begin an outreach program related to RRNC code adoption to appropriate stake holders ?*

Not Likely

Likely

Very Likely

# Questions/Discussion

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Please use the chat box to  
post any questions!



# Response and Requests

Please respond with feedback to the post-webinar questionnaire you will receive soon.

National Radon Program Services at Kansas State is ready to assist in your code outreach and adoption initiatives – **please contact us if we can be of service with training, technical assistance or other information and resources.**



# National Radon Program Services

— increasing public knowledge of radon and the need to test and fix homes

MAIN  
PAGE

ORDER  
KIT

EPA  
PUBS

FAQ

BUY &  
SELL

Who is  
certified to  
fix my home?

\$1,500  
average cost  
to fix

Can I build  
Radon-  
Resistant?

Yes.  
When done  
properly

How do I  
find a  
test kit?

21,000  
deaths from  
lung cancer

Do I, or my  
family have  
lung cancer?

#1 cause of  
lung cancer  
in non-smokers

I'm buying/  
selling.  
Who tests?

1 in 15 homes  
test high  
for radon

Bruce Snead – [bsnead@ksu.edu](mailto:bsnead@ksu.edu)

785-532-4992

Brian Hanson – [bhanson@ksu.edu](mailto:bhanson@ksu.edu)

785-532-4996

<https://sosradon.org/Resources-for-RRNC-Code-Adoption>