



**KANSAS STATE**  
UNIVERSITY

# Radon Programs



IRC Appendix F Adoption and Code  
Implementation for Denver

panel discussion

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And participants!

# Denver Appendix F – Radon Control Methods

Section AF101.1 General is replaced as follows:

AF101.1 General. Compliance with the provisions of Appendix AF shall be required in all the following types of construction:

1. Construction of one- and two-family dwellings and townhouses constructed under this code.
2. Additions to dwellings units with existing radon control systems, that include living space, storage space, or utility space constructed over previously exposed earth.
3. New basement additions converted from existing crawl spaces.

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4. Additions to dwellings units without existing radon control systems, that include living space, storage space, or utility space constructed over previously exposed earth with a foundation footprint greater than 300 square feet.

5. Alterations to existing dwelling units or accessory structures that convert nonliving spaces directly over the earth into living space, or storage or utility spaces, such as a change of use of a garage to a living space.

Exceptions:

1. Alterations to existing dwelling units or accessory structures where existing floor assemblies are to remain unaltered.
2. Unconditioned attached and detached garages.

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Section AF103.2 Subfloor preparation is amended by adding item #4 as follows:

4. A soil gas collection mat system shall be installed on top of the sub-grade and beneath a concrete floor slab. The mat shall be installed in a continuous rectilinear loop having a minimum dimension of 1-inch in height by 12-inches (305-mm) in width and a nominal cross-sectional area for airflow of no less than 12 square inches (0.093 m<sup>2</sup>). The mat shall be constructed of a matrix that allows for the movement of air through it and shall be capable of supporting the concrete placed upon it. The matrix shall be covered by approved filter material on all four sides to prevent dirt or concrete from entering the matrix. All breaches and joints in the filter material shall be repaired prior to the placement of the slab.

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- The loop shall be located within 18 inches (458 mm) of the inside of the exterior perimeter foundation walls. Flat mat materials shall not be spaced further than 20 feet (6096 mm) between runs and shall communicate with the bottom of the concrete slab. Where foundation walls, grade beams, or similar separate the under-slab areas, the mat shall communicate through the separations, into each separate area, and form a continuous loop around the exterior perimeter foundation walls. Both ends of the loop shall enter a “T” or equivalent connection from either side to reduce restrictions at the point of connection to the riser.

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Section AF103.5.3 Vent pipe is amended by adding an exception as follows:

Exception: For new basement additions the vent pipe is not required to extend vertically through building floors and the roof where an active wall vent in accordance with Section AF103.13 is installed.

Section AF103.6.2 Multiple vent pipes is amended by adding an exception as follows:

Exception: A separate vertical vent pipe is not required in a separate subslab area where a minimum of 2 penetrations are provided through the footing or barrier adjacent to a vented subslab area. Each penetration shall be a minimum of 12 square inches (0.093 m<sup>2</sup>) for each 10 feet (3048 mm) or less of footing or barrier length.

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Section AF103.8 Vent pipe accessibility is deleted in its entirety and amended to read as follows:

AF103.8 Vent pipe accessibility. Access to radon vent pipes and a space for future fan installation shall be provided in accessible attic or roof top areas outside the habitable space. Access for future fans shall not be located in crawl spaces, basements, below grade, or below habitable spaces. Fans located in unvented attic space shall be isolated in an enclosure that does not communicate with the rest of the attic space. The fan enclosure shall be sealed against air leakage and shall be vented to the outdoors.

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Section AF103.13 Active wall vent is added as follows:

Section AF103.13 Active wall vent. The vent pipe for dwelling units complying with section AF103.5.3 may be installed on the outside of the building when in accordance with all the following:

1. The vent pipe shall be an active system with fan locations compliant with section AF103.8.
2. The vent pipe shall extend vertically past the roof eave and terminate not less than 12 inches (305 mm) above the surface of the roof covering.



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3. The vent pipe termination shall be no less than 3 feet (914 mm) above any forced-air inlet located within 10 feet (3048 mm), not less than 2 feet (610 mm) above any window or other opening located within 10 feet (3048 mm), and not less than 10 feet (3048 mm) from any window or other opening in adjoining or adjacent buildings.
4. The vent pipe shall not terminate over public walkways or over an area where condensate or vapor could create a nuisance or hazard or could be detrimental to the operation of regulators, relief valves or other equipment.
5. Piping joints and connections to fans and other components that are subject to fan- induced positive pressure shall be tested for leakage while the system is operating normally.

# Discussion Questions

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- What level of detail is required at plan submittal for radon components as part of appendix F specifications?

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- Denver plan reviewers require that all radon systems comply with the specific language of the code, no more or no less.
- The level of detail required for plan review approval includes detailed drawings and reference notes indicating materials specific to the building proposed showing the sub slab preparation, vertical vent pipe, plan location and roof top vent location. Photocopies of the building section details in the 2018 IRC Appendix are not acceptable.
- Plan reviewers have had general training as well as updates and questions in weekly meetings. Plan reviewers approvals shall be consistent with the Appendix F.

What is the response to failure to install a rough in passive system?

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- A Passive system needs to be installed per Appendix F / AF requirements.

What are the ramifications if a system that does not meet code passes inspection?

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- Radon Systems are Inspected to Meet Appendix F / AF requirements.

Can inspectors wave the requirement to install a passive system?

- NO

# What training are inspectors/plan reviewers receiving/received?

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- Training is ongoing for Inspectors
- Plan review teams?

What should builders/contractors do when a inspector requires a component for appendix F that is contrary to what was approved at plan review?

- Builders can always have their Leaders / Design professional's provide the code path for what they are or are not installing to the Inspector(s) and / or Chief Inspector(s) when they don't agree with the Inspectors Correction requirements.
- Those code paths provided, along with the approved plans and the appropriate code sections will be reviewed and a Decision provided or they can complete the required corrections.



# Other Questions

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- Do system designers need to be licensed?
- Are tract home developers using licensed installers?
- Jurisdictional interpretations of code requirements – consistent?
- Can inspectors require 4” of gravel?
- Does the code apply to multi-family or just 1-2 single family and townhouses?
- How can the building community stay abreast of the code requirements?

