

**VILLAGE OF DOWNERS GROVE  
REPORT FOR THE VILLAGE COUNCIL MEETING  
MARCH 18, 2014 AGENDA**

SUBJECT:	TYPE:	SUBMITTED BY:
Adoption of Radon Mitigation Standards for New Residential Construction	✓ Resolution Ordinance Motion Discussion Only	Tom Dabareiner, AICP Community Development Director

**SYNOPSIS**

An Ordinance has been prepared amending portions of Chapter 7 of the Downers Grove Municipal Code to adopt Radon Mitigation Standards for New Residential Construction in accordance with the State of Illinois Radon Resistant Construction Act.

**STRATEGIC PLAN ALIGNMENT**

The goals for 2011-2018 identified *Steward of Financial and Environmental Sustainability*.

**FISCAL IMPACT**

N/A

**RECOMMENDATION**

Staff recommends approval on the April 1, 2014 active agenda.

**BACKGROUND**

Under state law, the Village is required to adopt rules of the Radon Resistant Construction Act (420 ILCS 52/1, et seq.), which was passed by the State of Illinois in June 2013. This law requires that all new residential construction include passive radon resistant construction. Radon is a radioactive element that is caused by the decay of uranium in the soil and is a cause of lung cancer among non-smokers.

The Illinois Emergency Management Agency has primary responsibility for oversight, but local governments must provide for the administration and enforcement of this law. To accomplish this, the Village must adopt that Agency’s rules as part of the International Residential Code (2006) for radon resistant construction systems, including the fixtures, materials, and design and installation methods. These rules were issued by the Joint Committee on Administrative Rules (JCAR) effective December 9, 2013, and are included here for adoption by reference.

Staff recommends approval of the building code amendment as proposed.

**ATTACHMENT**

Ordinance

The Radon Resistant Construction Act (420 ILCS 52/)

JCAR Section 422.160 Mitigation Standard for New Residential Construction

Radon

ORDINANCE NO. \_\_\_\_\_

**AN ORDINANCE ADOPTING MITIGATION STANDARDS  
FOR NEW RESIDENTIAL CONSTRUCTION IN ACCORDANCE WITH  
THE STATE OF ILLINOIS RADON RESISTANT CONSTRUCTION ACT**

BE IT ORDAINED by the Village Council of the Village of Downers Grove in DuPage County, Illinois, as follows: (Additions are indicated by shading/underline; deletions by ~~strikeout~~):

**Section 1. That Section 7.1202. is hereby amended to read as follows:**

**7.1202. International Residential Code - Amendments.**

The deletions from and modifications and amendments to the 2006 International Residential Code are the following:

\* \* \*

The following appendices are adopted by reference as amended:

**APPENDIX F**

**AF101.1** is amended by deleting the same in its entirety and by substituting in lieu thereof the following:

**AF101.1 General.** This appendix contains requirements for new construction in accordance with the Radon Resistant Construction Act (420 ILCS 52/1, et. seq.)

**AF102** is amended by deleting the same in its entirety.

**AF103** is amended by deleting the same in its entirety and by substituting in lieu thereof the following:

**AF103 REQUIREMENTS**

**AF103.1 General.** The construction techniques intended to resist radon entry and prepare the building for post-construction radon mitigation shall be in accordance with 32 Ill. Admin. Code 422.150 "Mitigation Standard for New Residential Construction".

\* \* \*

**Section 2.** That all ordinances or parts of ordinances in conflict with the provisions of this ordinance are hereby repealed.

**Section 3.** That this ordinance shall be in full force and effect from and after its passage and publication in the manner provided by law.

\_\_\_\_\_  
Mayor

Passed:

Published:

Attest: \_\_\_\_\_

Village Clerk

**Information maintained by the Legislative Reference Bureau**

Updating the database of the Illinois Compiled Statutes (ILCS) is an ongoing process. Recent laws may not yet be included in the ILCS database, but they are found on this site as [Public Acts](#) soon after they become law. For information concerning the relationship between statutes and Public Acts, refer to the [Guide](#).

Because the statute database is maintained primarily for legislative drafting purposes, statutory changes are sometimes included in the statute database before they take effect. If the source note at the end of a Section of the statutes includes a Public Act that has not yet taken effect, the version of the law that is currently in effect may have already been removed from the database and you should refer to that Public Act to see the changes made to the current law.

## **NUCLEAR SAFETY**

### **(420 ILCS 52/) Radon Resistant Construction Act.**

(420 ILCS 52/1)

Sec. 1. Short title. This Act may be cited as the Radon Resistant Construction Act.

(Source: P.A. 97-953, eff. 6-1-13.)

(420 ILCS 52/5)

Sec. 5. Findings. Radon is a radioactive element that is part of the radioactive decay chain of naturally occurring uranium in soil. Radon is the leading cause of lung cancer among non-smokers and the number one risk in homes according to the Harvard School of Public Health, Center for Risk Analysis. The 2008-2009 Annual Report from the President's Cancer Panel stated: "Comparative risk assessments by the Environmental Protection Agency and its Science Advisory Board have consistently ranked radon among the top 4 environmental risks to the public.". The World Health Organization's Handbook on Radon Key Messages include: "There is no known threshold concentration below which radon exposure presents no risk. The majority of radon-induced lung cancers are caused by low and moderate radon concentrations rather than by high radon concentrations, because in general less people are exposed to high indoor radon concentrations.". The Surgeon General of the United States urged Americans to test their homes to find out how much radon they might be breathing. The United States Environmental Protection Agency estimates that more than 20,000 Americans die of radon-related lung cancer each year.

(Source: P.A. 97-953, eff. 6-1-13.)

(420 ILCS 52/10)

Sec. 10. Primary responsibility with Illinois Emergency Management Agency.

(a) The Illinois Emergency Management Agency shall have primary responsibility for coordination, oversight, and implementation of all State functions in matters concerning the presence, effects, measurement, and mitigation of risks of radon and radon progeny in dwellings and other buildings. The Department of Natural Resources, the Environmental Protection Agency, the Department of Public Health, and other State agencies shall consult and cooperate with the Agency as requested and as necessary to fulfill the purposes of this Act.

(b) The Agency shall promulgate rules necessary for the administration and implementation of this Act.

(Source: P.A. 97-953, eff. 6-1-13.)

(420 ILCS 52/15)

Sec. 15. Definitions. As used in this Act, unless the context requires otherwise:

"Active mitigation system", also known as "active soil depressurization" or "ASD", means a family of radon mitigation systems involving mechanically driven soil depressurization, including sub-slab depressurization (SSD), drain tile depressurization (DTD), block wall depressurization (BWD), and sub-membrane depressurization (SMD).

"Agency" means the Illinois Emergency Management Agency.

"New residential construction" means any original construction of a single-family home or a dwelling containing 2 or fewer apartments, condominiums, or town houses.

"Passive new construction pipe" means a pipe installed in new construction that relies solely on the convective flow of air upward for soil gas depressurization and may consist of multiple pipes routed through conditioned space from below the foundation to above the roof.

"Radon" means a gaseous radioactive decay product of uranium or thorium.

"Radon contractor" means a person licensed in accordance with the Radon Industry Licensing Act to perform radon or radon progeny mitigation or to perform measurements of radon or radon progeny in an indoor atmosphere.

"Radon resistant construction" means the installation of passive new construction pipe during new residential construction.

"Residential building code" means an ordinance, resolution, or law that establishes standards applicable to new residential construction.

"Residential building contractor" means any individual, corporation, or partnership that constructs new residential construction.

"Task Force on Radon-Resistant Building Codes" means the Task Force on Radon-Resistant Building Codes as authorized by the Radon Industry Licensing Act.

(Source: P.A. 97-953, eff. 6-1-13.)

(420 ILCS 52/20)

Sec. 20. Adoption of passive radon resistant construction. All new residential construction in this State shall include passive radon resistant construction.

(Source: P.A. 97-953, eff. 6-1-13.)

(420 ILCS 52/25)

Sec. 25. Installation of active mitigation systems. The installation of an active mitigation system shall only be performed by a radon contractor. The installation of radon resistant construction may be performed by a residential building contractor or his or her subcontractors or a radon contractor during new residential construction. Only a radon contractor may install a radon vent fan or upgrade a passive

new construction pipe to an active mitigation system.  
(Source: P.A. 97-953, eff. 6-1-13.)

(420 ILCS 52/30)

Sec. 30. Local administration and enforcement. A local governmental unit that has adopted any ordinance, resolution, or law regulating radon resistant construction may provide for its administration and enforcement.  
(Source: P.A. 97-953, eff. 6-1-13.)

(420 ILCS 52/35)

Sec. 35. Local standards. Governmental units may adopt, pursuant to local ordinance, regulations at least as stringent as the rules promulgated by the Agency or may, by ordinance or resolution, adopt the rules promulgated by the Agency for radon resistant construction and the fixtures, materials, and design and installation methods of radon resistant construction systems. The rules promulgated by the Agency may be incorporated in the ordinance or resolution by reference.  
(Source: P.A. 97-953, eff. 6-1-13.)

(420 ILCS 52/97)

Sec. 97. (Amendatory provisions; text omitted).  
(Source: P.A. 97-953, eff. 8-13-12; text omitted.)

(420 ILCS 52/99)

Sec. 99. Effective date. This Act takes effect June 1, 2013, except that this Section and Section 97 take effect upon becoming law.  
(Source: P.A. 97-953, eff. 8-13-12.)

# **Joint Committee on Administrative Rules**

# **ADMINISTRATIVE CODE**

**TITLE 32: ENERGY**  
**CHAPTER II: ILLINOIS EMERGENCY MANAGEMENT AGENCY**  
**SUBCHAPTER b: RADIATION PROTECTION**  
**PART 422 REGULATIONS FOR RADON SERVICE PROVIDERS**  
**SECTION 422.160 MITIGATION STANDARD FOR NEW RESIDENTIAL**  
**CONSTRUCTION**

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## **Section 422.160 Mitigation Standard for New Residential Construction**

- a) General Practices. This Section contains the requirements for new construction in Illinois in accordance with the Radon Resistant Construction Act [420 ILCS 52]. The following required construction methods are intended to resist radon entry and prepare the building for post-construction radon mitigation, if necessary. These techniques are required in all areas of Illinois.
  
- b) Subfloor Preparation. A layer of gas-permeable material shall be placed under all concrete slabs and other floor systems that directly contact the ground and are within the walls of the living spaces of the buildings, to facilitate future installation of a sub-slab depressurization system, if needed. The gas permeable layer shall consist of one of the following:
  - 1) A uniform layer of clean aggregate, a minimum of 4 inches (102 mm) thick. The aggregate shall consist of material that will pass through a 2 inch (51 mm) sieve and be retained by a ¼ inch (6.4 mm) sieve; or
  - 2) A uniform layer of sand (native or fill), a minimum of 4 inches (102 mm) thick, overlain by a layer or strips of geo-textile drainage matting designed to allow the lateral flow of soil gases. The geotextile matting shall have a cross-sectional area of not less than 12 square inches (77 sq. cm) and shall be placed, at a minimum, along the entire inside perimeter of the foundation at a distance of 12 to 18 inches (30 to 46 cm) distance from the foundation wall to the edge of the drainage matting. Deviation from the 12 to 18 inches (30 to 46 cm) distance to the foundation wall shall be allowed to avoid obstacles such as plumbing and other utilities; or
  - 3) Other materials, systems or floor designs with demonstrated capability to permit depressurization across the entire subfloor area.

- c) Soil Gas Retarder. A minimum 6-mil (0.15 mm) (or 3-mil (0.075 mm) cross-laminate) polyethylene or equivalent flexible sheeting material shall be placed on top of the gas permeable layer prior to casting the slab or placing the floor assembly to serve as a soil gas retarder by bridging any cracks that develop in the slab or floor assembly and to prevent concrete from entering the void spaces in the aggregate base material. The sheeting shall cover the entire floor area with separate sections of sheeting lapped at least 12 inches (305 mm). The sheeting shall fit closely around any pipe, wire or other penetrations of the material. All punctures or tears in the material shall be sealed or covered with additional sheeting.
- d) Entry Routes. Potential radon entry routes shall be closed in accordance with the following:
- 1) Floor openings around bathtubs, showers, water closets, pipes, wires or other objects that penetrate concrete slabs or other floor assemblies shall be filled with a polyurethane caulk or equivalent sealant applied in accordance with the manufacturer's recommendations.
  - 2) All concrete control joints, isolation joints, construction joints and any other joints in concrete slabs or between slabs and foundation walls shall be sealed with a polyurethane caulk. Gaps and joints shall be cleared of loose material and filled with polyurethane caulk applied in accordance with the manufacturer's recommendations.
  - 3) Condensate drains shall be trapped or routed through non-perforated pipe to daylight.
  - 4) Sump pits open to soil or serving as the termination point for subslab or exterior drain tile loops shall be covered with a gasketed or otherwise sealed lid. Sump pits shall not be used as a primary suction point in a sub-slab depressurization system. Sumps used as a floor drain shall have a lid equipped with a trapped inlet.
  - 5) Hollow block masonry foundation walls shall be constructed with either a continuous course of solid masonry, one course of masonry grouted solid, or a solid concrete beam at or above finished ground surface to prevent passage of air from the interior of the wall into the living space. Where a brick veneer or other masonry ledge is installed, the course immediately below that ledge shall be sealed. Joints, cracks or other openings around all penetrations of both exterior and interior surfaces of masonry block or wood foundation walls below the ground surface shall be filled with polyurethane caulk or equivalent sealant. Penetrations of concrete walls shall be filled.
  - 6) The exterior surfaces of concrete and masonry block walls below the ground

surface shall be damp-proofed in accordance with Section R406 of the 2012 International Residential Code for One- and Two-Family Dwellings (copyrighted 2011 by the International Code Council, Inc.; incorporated by reference in accordance with Section 422.15).

- 7) Air-handling units shall be sealed to prevent air from being drawn into the unit. Units with gasketed seams or units that are otherwise sealed by the manufacturer to prevent leakage are exempted from this requirement.
  - 8) Underground and crawlspace duct systems shall be sealed in accordance with Section M1601.4 of the 2012 International Residential Code for One- and Two-Family Dwellings (copyrighted 2011 by the International Code Council, Inc.; incorporated by reference in accordance with Section 422.15).
  - 9) Openings around all penetrations through floors above crawlspaces shall be caulked or otherwise filled to prevent air leakage.
  - 10) Access doors and other openings or penetrations into crawlspaces shall be closed, gasketed or otherwise sealed to prevent air leakage.
- e) Passive Sub-membrane Depressurization (SMD) System. In buildings with crawlspace foundations or earthen floors, the following components of a passive SMD system shall be installed during construction.
- 1) Crawlspaces shall be provided with vents to the exterior of the building in accordance with Section R408 of the 2012 International Residential Code for One- and Two-Family Dwellings.
  - 2) The soil in crawlspaces shall be covered with a continuous layer of minimum 6-mil (0.15 mm) polyethylene soil gas retarder. The ground cover shall be lapped a minimum of 12 inches (305 mm) at joints and shall extend to all foundation walls enclosing the crawlspace area.
  - 3) Any seams in soil gas retarder membranes shall be overlapped at least 12 inches and sealed in a permanent air tight manner using compatible glues. The membrane shall also be sealed around interior piers and to the inside of exterior walls with furring strips and compatible glues or in accordance with specific procedures submitted by radon contractors as part of their license application and approved by the Agency.
  - 4) A plumbing tee or other approved connection fitted with not less than 5 feet (105 m) of perforated pipe extending from each horizontal opening of the tee shall be inserted horizontally beneath the sheeting and connected to a 3- or 4-inch diameter (76 mm or 102 mm) fitting with a vertical vent pipe installed through the sheeting. The vent pipe shall be extended up through the building floors, terminate



at least 12 inches (305 mm) above the penetration in the highest roof in a location at least 2 feet (609.6 mm) above any window or other opening into the conditioned spaces of the building and 10 feet (3048 mm) from any window or other opening in adjoining or adjacent buildings.

- f) Passive Sub-Slab Depressurization (SSD) System. Buildings with a basement, crawlspace or slab-on grade concrete floor in contact with the earth or grade shall have the following components of a passive SSD system that shall be installed during construction.
- 1) A minimum 3-inch diameter (76 mm) Schedule 40 PVC shall be embedded vertically into the sub-slab aggregate or other permeable material before the slab is cased.
    - A) A plumbing tee or other approved connection fitted with not less than 5 feet (105 m) of perforated pipe extending from each horizontal opening of the tee shall be inserted horizontally within the sub-slab permeable material to ensure that the pipe opening remains within the sub-slab. Alternatively, the 3-inch (76 mm) pipe shall be inserted directly into an interior perimeter drain tile loop. The vent pipe shall be extended up through the building floors, terminate at least 12 inches (305 mm) above the penetration in the highest roof in a location of at least 2 feet (609.6 mm) above any window or other opening into the conditioned spaces of the building and 10 feet (3048 mm) from any window or other opening in adjoining or adjacent buildings; or
    - B) A penetration into the sub-slab permeable material may be cored through sub-slab after the slab is cased. A minimum 3-inch diameter (76 mm) Schedule 40 PVD shall be embedded vertically into the sub-slab aggregate or other permeable material and extended up through the building floors, terminate at least 12 inches (305 mm) above the penetration in the highest roof in a location at least 2 feet (609.6 mm) above any window or other opening into the conditioned spaces of the building and 10 feet (3048 mm) from any window or other opening in adjoining or adjacent buildings.
  - 2) In buildings where interior footings or other barriers separate the sub-slab aggregate or other gas-permeable material, each area shall be fitted with an individual vent pipe. Vent pipes shall connect to a single vent that shall terminate at least 12 inches (305 mm) above the penetration in the highest roof in a location at least 2 feet (609.6 mm) above any window or other opening into the conditioned spaces of the building and 10 feet (3048 mm) from any window or other opening in adjoining or adjacent buildings.
- g) All components of the radon vent pipe system shall be installed to provide positive drainage to the ground beneath the slab or soil gas retarder.

- h) Radon vent pipes shall be accessible for fan installation through an attic or other area outside and above the habitable space. The radon vent pipe need not be accessible in an attic space when an approved roof-top electrical supply is provided for future use.
- i) All exposed and visible interior radon vent pipes shall be conspicuously identified with at least one label on each floor and in accessible attics. The label shall read "Radon Reduction System".
- j) Combination basement/crawlspace or slab-on-grade/crawlspace foundations shall have separate radon vent pipes installed in each type of foundation area or be connected with a continuous drain tile loop. Vent pipes shall connect to a single vent that shall terminate at least 12 inches (305 mm) above the highest roof in a location at least 2 feet (609.6 mm) above any window or other opening into the conditioned spaces of the building and 10 feet (3048 mm) from any window or other opening in adjoining or adjacent buildings.
- k) Joints in air ducts and plenum spaces shall meet the requirements of Section M1601 of the 2012 International Residential Code for One- and Two-Family Dwellings (copyrighted 2011 by the International Code Council, Inc.; incorporated by reference pursuant to Section 422.15). Thermal envelope air infiltration requirements shall comply with the energy conservation provisions in Chapter 11 of the 2012 International Residential Code for One- and Two-Family Dwellings (copyrighted 2011 by the International Code Council, Inc.; incorporated by reference pursuant to Section 422.15). Firestopping shall be in conformance with the most recent general building code enacted by the appropriate local government or meet the requirements contained in Section R302.11 of the 2012 International Residential Code for One- and Two-Family Dwellings (copyrighted 2011 by the International Code Council, Inc.; incorporated by reference in accordance with Section 422.15).
- l) To provide for future installation of an active SMD or SSD system, an electrical circuit terminated to a single outlet in an accessible approved box shall be installed during construction in the attic in the anticipated location of vent pipe fans.
- m) To provide for future installation of an active SSD, the piping length in the attic of the building shall have a minimum height of 3 feet to allow for the anticipated installation of a radon mitigation fan in the vent pipe.
- n) The juncture of each radon vent pipe with the roof line shall be made water tight by an approved flashing. Lead vent flashings or any other flashing or cap that would impede the exhaust from the radon vent are prohibited from use.

(Source: Added at 37 Ill. Reg. 20240, effective December 9, 2013)