

**Appendix A Sizing and Capacities of Gas Piping.** This appendix is informative and not part of the code. It provides design guidance, useful facts and data and multiple examples of how to apply the sizing tables and sizing methodologies of Chapter 24.

**Appendix B Sizing of Venting Systems Serving Appliances Equipped with Draft Hoods, Category I Appliances and Appliances Listed for Use with Type B Vents.** This appendix is informative and not part of the code. It contains multiple examples of how to apply the vent and chimney tables and methodologies of Chapter 24.

**Appendix C Exit Terminals of Mechanical Draft and Direct-vent Venting Systems.** This appendix is informative and not part of the code. It consists of a figure and notes that visually depict code requirements from Chapter 24 for vent terminals with respect to the openings found in building exterior walls.

**Appendix D Recommended Procedure for Safety Inspection of an Existing Appliance Installation.** This appendix is informative and not part of the code. It provides recommended procedures for testing and inspecting an appliance installation to determine if the installation is operating safely and if the appliance is in a safe condition.

**Appendix E Manufactured Housing Used as Dwellings.** The criteria for the construction of manufactured homes are governed by the National Manufactured Housing Construction and Safety Act. While this act may seem to cover the bulk of the construction of manufactured housing, it does not cover those areas related to the placement of the housing on the property. The provisions of Appendix E are not applicable to the design and construction of manufactured homes. Appendix E provides a complete set of regulations in conjunction with federal law for the installation of manufactured housing. This appendix also contains provisions for existing manufactured home installations.

**Appendix F Radon Control Methods.** Radon comes from the natural (radioactive) decay of the element radium in soil, rock and water and finds its way into the air. Appendix F contains requirements to mitigate the transfer of radon gases from the soil into the dwelling. The provisions of this appendix regulate the design and construction of radon-resistant measures intended to reduce the entry of radon gases into the living space of residential buildings.

**Appendix G Swimming Pools, Spas and Hot Tubs.** Appendix G provides the regulations for swimming pools, hot tubs and spas installed in or on the lot of a one- or two-family dwelling. This appendix contains provisions for an effective barrier surrounding the water area and entrapment protection for suction outlets to reduce the potential for drowning of young children.

**Appendix H Patio Covers.** Appendix H sets forth the regulations and limitations for patio covers. The provisions address those uses permitted in patio cover structures, the minimum design loads to be assigned for structural purposes, and the effect of the patio cover on egress and emergency escape or rescue from sleeping rooms. This appendix also contains the special provisions for aluminum screen enclosures in hurricane-prone regions.

**Appendix I Private Sewage Disposal.** Appendix I simply provides the opportunity to utilize the International Private Sewage Disposal Code for the design and installation of private sewage disposal in one- and two-family dwellings.

**Appendix J Existing Buildings and Structures.** Appendix J contains the provisions for the repair, renovation, alteration and reconstruction of existing buildings and structures that are within the scope of this code. To accomplish this objective and to make the rehabilitation process more available, this appendix allows for a controlled departure from full code compliance without compromising minimum life safety, fire safety, structural and environmental features of the rehabilitated existing building or structure.

**Appendix K Sound Transmission.** Appendix K regulates the sound transmission of wall and floor-ceiling assemblies separating dwelling units and townhouse units. Air-borne sound insulation is required for walls. Air-borne sound insulation and impact sound insulation are required for floor-

## APPENDIX F

# RADON CONTROL METHODS

*(The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.)*

### SECTION AF101 SCOPE

**AF101.1 General.** This appendix contains requirements for new construction in *jurisdictions* where radon-resistant construction is required.

Inclusion of this appendix by *jurisdictions* shall be determined through the use of locally available data or determination of Zone 1 designation in Figure AF101 and Table AF101(1).

### SECTION AF102 DEFINITIONS

**AF102.1 General.** For the purpose of these requirements, the terms used shall be defined as follows:

**DRAIN TILE LOOP.** A continuous length of drain tile or perforated pipe extending around all or part of the internal or external perimeter of a *basement* or crawl space footing.

**RADON GAS.** A naturally occurring, chemically inert, radioactive gas that is not detectable by human senses. As a gas, it can move readily through particles of soil and rock, and can accumulate under the slabs and foundations of homes where it can easily enter into the living space through construction cracks and openings.

**SOIL-GAS-RETARDER.** A continuous membrane of 6-mil (0.15 mm) polyethylene or other equivalent material used to retard the flow of soil gases into a building.

**SUBMEMBRANE DEPRESSURIZATION SYSTEM.** A system designed to achieve lower submembrane air pressure relative to crawl space air pressure by use of a vent drawing air from beneath the soil-gas-retarder membrane

**SUBSLAB DEPRESSURIZATION SYSTEM (Active).** A system designed to achieve lower subslab air pressure relative to indoor air pressure by use of a fan-powered vent drawing air from beneath the slab.

**SUBSLAB DEPRESSURIZATION SYSTEM (Passive).** A system designed to achieve lower subslab air pressure relative to indoor air pressure by use of a vent pipe routed through the *conditioned space* of a building and connecting the subslab area with outdoor air, thereby relying on the convective flow of air upward in the vent to draw air from beneath the slab.

### SECTION AF103 REQUIREMENTS

**AF103.1 General.** The following construction techniques are intended to resist radon entry and prepare the building for

post-construction radon mitigation, if necessary (see Figure AF102). These techniques are required in areas where designated by the *jurisdiction*.

**AF103.2 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 building, to facilitate future installation of a subslab 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  $\frac{1}{4}$ -inch (6.4 mm) sieve.
2. A uniform layer of sand (native or fill), a minimum of 4 inches (102 mm) thick, overlain by a layer or strips of geotextile drainage matting designed to allow the lateral flow of soil gases.
3. Other materials, systems or floor designs with demonstrated capability to permit depressurization across the entire subfloor area.

**AF103.3 Soil-gas-retarder.** A minimum 6-mil (0.15 mm) [or 3-mil (0.075 mm) cross-laminated] 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.

**AF103.4 Entry routes.** Potential radon entry routes shall be closed in accordance with Sections AF103.4.1 through AF103.4.10.

**AF103.4.1 Floor openings.** 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.

**AF103.4.2 Concrete joints.** All control joints, isolation joints, construction joints, and any other joints in concrete slabs or between slabs and foundation walls shall be sealed with a caulk or sealant. Gaps and joints shall be cleared of loose material and filled with polyurethane caulk or other elastomeric sealant

applied in accordance with the manufacturer's recommendations.

**AF103.4.3 Condensate drains.** Condensate drains shall be trapped or routed through nonperforated pipe to daylight.

**AF103.4.4 Sumps.** 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. Sumps used as the suction point in a subslab depressurization system shall have a lid designed to accommodate the vent pipe. Sumps used as a floor drain shall have a lid equipped with a trapped inlet.

**AF103.4.5 Foundation walls.** 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 the 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.

**AF103.4.6 Dampproofing.** The exterior surfaces of portions of concrete and masonry block walls below the ground surface shall be dampproofed in accordance with Section R406.

**AF103.4.7 Air-handling units.** Air-handling units in crawl spaces shall be sealed to prevent air from being drawn into the unit.

**Exception:** Units with gasketed seams or units that are otherwise sealed by the manufacturer to prevent leakage.

**AF103.4.8 Ducts.** Ductwork passing through or beneath a slab shall be of seamless material unless the air-handling system is designed to maintain continuous positive pressure within such ducting. Joints in such ductwork shall be sealed to prevent air leakage.

Ductwork located in crawl spaces shall have all seams and joints sealed by closure systems in accordance with Section M1601.4.1.

**AF103.4.9 Crawl space floors.** Openings around all penetrations through floors above crawl spaces shall be caulked or otherwise filled to prevent air leakage.

**AF103.4.10 Crawl space access.** Access doors and other openings or penetrations between *basements* and adjoining crawl spaces shall be closed, gasketed or otherwise filled to prevent air leakage.

**AF103.5 Passive submembrane depressurization system.** In buildings with crawl space foundations, the following

components of a passive submembrane depressurization system shall be installed during construction.

**Exception:** Buildings in which an *approved* mechanical crawl space ventilation system or other equivalent system is installed.

**AF103.5.1 Ventilation.** Crawl spaces shall be provided with vents to the exterior of the building. The minimum net area of ventilation openings shall comply with Section R408.1.

**AF103.5.2 Soil-gas-retarder.** The soil in crawl spaces 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 crawl space area.

**AF103.5.3 Vent pipe.** A plumbing tee or other *approved* connection shall be inserted horizontally beneath the sheeting and connected to a 3- or 4-inch-diameter (76 or 102 mm) fitting with a vertical vent pipe installed through the sheeting. The vent pipe shall be extended up through the building floors, and terminate at least 12 inches (305 mm) above the roof in a location at least 10 feet (3048 mm) away from any window or other opening into the *conditioned spaces* of the building that is less than 2 feet (610 mm) below the exhaust point, and 10 feet (3048 mm) from any window or other opening in adjoining or adjacent buildings.

**AF103.6 Passive subslab depressurization system.** In *basement* or slab-on-grade buildings, the following components of a passive subslab depressurization system shall be installed during construction.

**AF103.6.1 Vent pipe.** A minimum 3-inch-diameter (76 mm) ABS, PVC or equivalent gas-tight pipe shall be embedded vertically into the subslab aggregate or other permeable material before the slab is cast. A "T" fitting or equivalent method shall be used to ensure that the pipe opening remains within the subslab permeable material. Alternatively, the 3-inch (76 mm) pipe shall be inserted directly into an interior perimeter drain tile loop or through a sealed sump cover where the sump is exposed to the subslab aggregate or connected to it through a drainage system.

The pipe shall be extended up through the building floors, and terminate at least 12 inches (305 mm) above the surface of the roof in a location at least 10 feet (3048 mm) away from any window or other opening into the *conditioned spaces* of the building that is less than 2 feet (610 mm) below the exhaust point, and 10 feet (3048 mm) from any window or other opening in adjoining or adjacent buildings.

**AF103.6.2 Multiple vent pipes.** In buildings where interior footings or other barriers separate the subslab 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 terminates above the roof or each individual vent pipe shall terminate separately above the roof.

**AF103.7 Vent pipe drainage.** 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.

**AF103.8 Vent pipe accessibility.** Radon vent pipes shall be accessible for future fan installation through an *attic* or other area outside the *habitable space*.

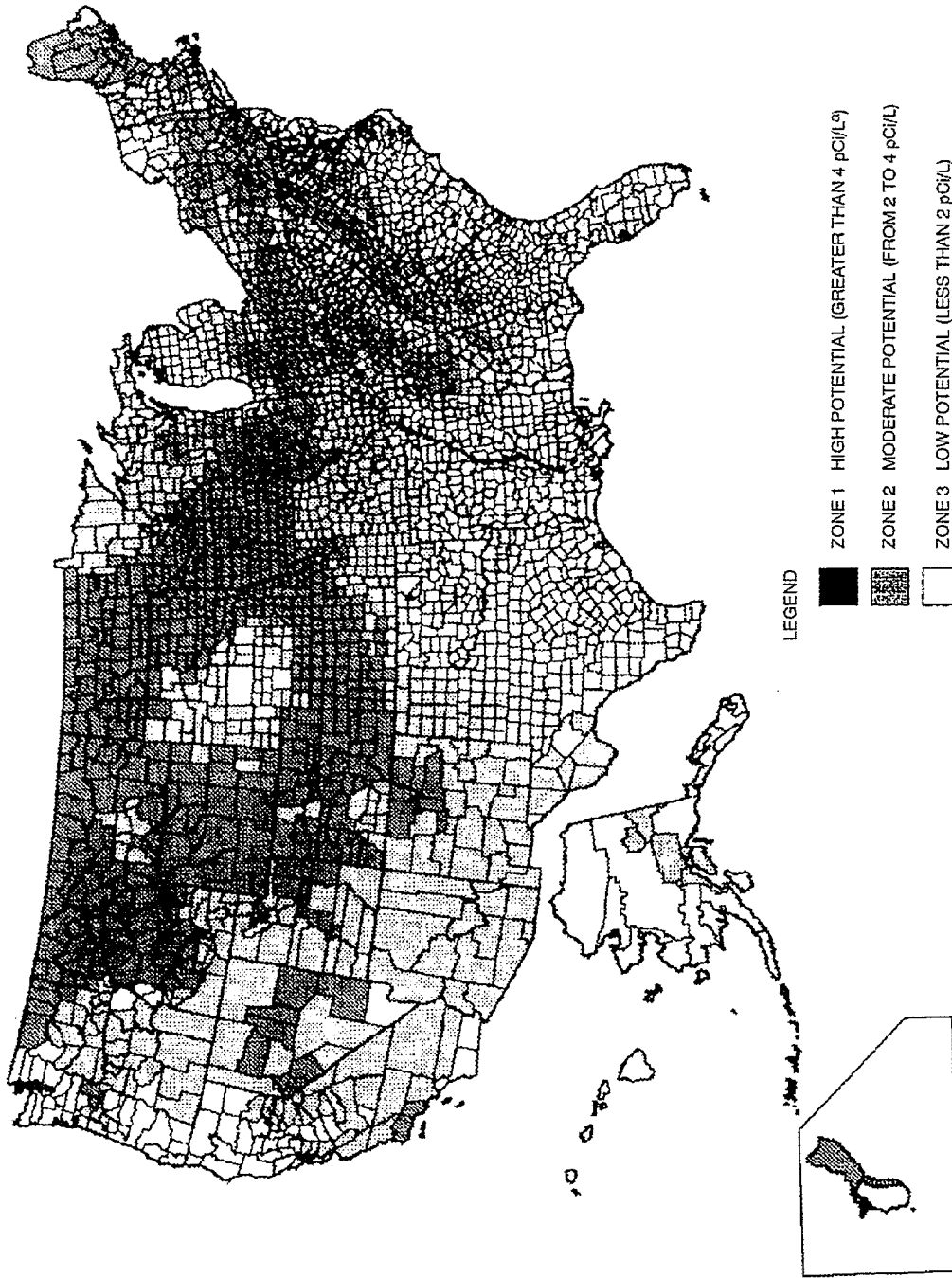
**Exception:** The radon vent pipe need not be accessible in an *attic* space where an *approved* roof-top electrical supply is provided for future use.

**AF103.9 Vent pipe identification.** All exposed and visible interior radon vent pipes shall be identified with at least one *label* on each floor and in accessible *attics*. The *label* shall read: "Radon Reduction System."

**AF103.10 Combination foundations.** Combination *basement/crawl* space or *slab-on-grade/crawl* space foundations shall have separate radon vent pipes installed in each type of foundation area. Each radon vent pipe shall terminate above the roof or shall be connected to a single vent that terminates above the roof.

**AF103.11 Building depressurization.** Joints in air ducts and plenums in *unconditioned spaces* shall meet the requirements of Section M1601. Thermal envelope air infiltration requirements shall comply with the energy conservation provisions in Chapter 11. Fireblocking shall meet the requirements contained in Section R302.11.

**AF103.12 Power source.** To provide for future installation of an active submembrane or subslab depressurization system, an electrical circuit terminated in an *approved* box shall be installed during construction in the *attic* or other anticipated location of vent pipe fans. An electrical supply shall also be accessible in anticipated locations of system failure alarms.



LEGEND

- ZONE 1 HIGH POTENTIAL (GREATER THAN 4 pCi/L<sup>a</sup>)
- ▨ ZONE 2 MODERATE POTENTIAL (FROM 2 TO 4 pCi/L)
- ZONE 3 LOW POTENTIAL (LESS THAN 2 pCi/L)

a. pCi/L standard for picocuries per liter of radon gas. The U.S. Environmental Protection Agency (EPA) recommends that all homes that measure 4 pCi/L and greater be mitigated. The EPA and the U.S. Geological Survey have evaluated the radon potential in the United States and have developed a map of radon zones designed to assist building officials in deciding whether radon-resistant features are applicable in new construction. The map assigns each of the 3,141 counties in the United States to one of three zones based on radon potential. Each zone designation reflects the average short-term radon measurement that can be expected to be measured in a building without the implementation of radon-control methods. The radon zone designation of highest priority is Zone 1. Table AF101 lists the Zone 1 counties illustrated on the map. More detailed information can be obtained from state-specific booklets (EPA-402-R-93-021 through 070) available through State Radon Offices or from EPA Regional Offices.

FIGURE AF101  
EPA MAP OF RADON ZONES

TABLE AF101(1)  
HIGH RADON-POTENTIAL (ZONE 1) COUNTIES<sup>a</sup>

<b>ALABAMA</b>	<b>CONNECTICUT</b>	Moultrie	Warren	Wallace	Jackson	Wilkin
Calhoun	Fairfield	Ogle	Washington	Washington	Kalamazoo	Winona
Clay	Middlesex	Peoria	Wayne	Wichita	Lenawee	Wright
Cleburne	New Haven	Piatt	Wells	Wyandotte	St. Joseph	Yellow Medicine
Colbert	New London	Pike	White		Washtenaw	
Coosa		Putnam	Whitley	<b>KENTUCKY</b>		<b>MISSOURI</b>
Franklin	<b>GEORGIA</b>	Rock Island		Adair		Andrew
Jackson	Cobb	Sangamon	<b>IOWA</b>	Allen	<b>MINNESOTA</b>	Atchison
Lauderdale	De Kalb	Schuyler	All Counties	Barren	Big Stone	Buchanan
Lawrence	Fulton	Scott		Bourbon	Blue Earth	Cass
Limestone	Gwinnett	Stark	<b>KANSAS</b>	Boyle	Brown	Clay
Madison		Stephenson	Atchison	Bullitt	Carver	Clinton
Morgan	<b>IDAHO</b>	Tazewell	Barton	Casey	Chippewa	Holt
Talladega	Benewah	Vermilion	Brown	Clark	Clay	Iron
	Blaine	Warren	Cheyenne	Cumberland	Cottonwood	Jackson
<b>CALIFORNIA</b>	BoiseBonner	Whiteside	Clay	Fayette	Dakota	Nodaway
Santa Barbara	Boundary	Winnabago	Cloud	Franklin	Dodge	Platte
Ventura	Butte	Woodford	Decatur	Green	Douglas	
	Camas		Dickinson	Harrison	Faribault	<b>MONTANA</b>
<b>COLORADO</b>	Clark	<b>INDIANA</b>	Douglas	Hart	Fillmore	Beaverhead
Adams	Clearwater	Adams	Ellis	Jefferson	Freeborn	Big Horn
Arapahoe	Custer	Allen	Ellsworth	Jessamine	Goodhue	Blaine
Baca	Elmore	Bartholomew	Finney	Lincoln	Grant	Broadwater
Bent	Fremont	Benton	Ford	Marion	Hennepin	Carbon
Boulder	Gooding	Blackford	Geary	Mercer	Houston	Carter
Chaffee	Idaho	Boone	Gove	Metcalfe	Hubbard	Cascade
Cheyenne	Kootenai	Carroll	Graham	Monroe	Jackson	Chouteau
Clear Creek	Latah	Cass	Grant	Nelson	Kanabec	Custer
Crowley	Lemhi	Clark	Gray	Pendleton	Kandiyohi	Daniels
Custer	Shoshone	Clinton	Greeley	Pulaski	Kittson	Dawson
Delta	Valley	De Kalb	Hamilton	Robertson	Lac Qui Parle	Deer Lodge
Denver		Decatur	Haskell	Russell	Le Sueur	Fallon
Dolores	<b>ILLINOIS</b>	Delaware	Hodgeman	Scott	Lincoln	Fergus
Douglas	Adams	Elkhart	Jackson	Taylor	Lyon	Flathead
Ei Paso	Boone	Fayette	Jewell	Warren	Mahnomen	Gallatin
Elbert	Brown	Fountain	Johnson	Woodford	Marshall	Garfield
Fremont	Bureau	Fulton	Kearny		Martin	Glacier
Garfield	Calhoun	Grant	Kingman	<b>MAINE</b>	McLeod	Granite
Gilpin	Carroll	Hamilton	Kiowa	Androscoggin	Meeker	Hill
Grand	Cass	Hancock	Lane	Aroostook	Mower	Jefferson
Gunnison	Champaign	Harrison	Leavenworth	Cumberland	Murray	Judith Basin
Huerfano	Coles	Hendricks	Lincoln	Franklin	Nicollet	Lake
Jackson	De Kalb	Henry	Logan	Hancock	Nobles	Lewis and Clark
Jefferson	De Witt	Howard	Marion	Kennebec	Norman	Madison
Kiowa	Douglas	Huntington	Marshall	Lincoln	Olmsted	McCone
Kit Carson	Edgar	Jay	McPherson	Oxford	Otter Tail	Meagher
Lake	Ford	Jennings	Meade	Penobscot	Pennington	Missoula
Larimer	Fulton	Johnson	Mitchell	Piscataquis	Pipestone	Park
Las Animas	Greene	Kosciusko	Nemaha	Somerset	Polk	Phillips
Lincoln	Grundy	LaGrange	Ness	York	Pope	Pondera
Logan	Hancock	Lawrence	Norton		Ramsey	Powder River
Mesa	Henderson	Madison	Osborne	<b>MARYLAND</b>	Red Lake	Powell
Moffat	Henry	Marion	Ottawa	Baltimore	Redwood	Prairie
Montezuma	Iroquois	Marshall	Pawnee	Calvert	Renville	Ravalli
Montrose	Jersey	Miami	Phillips	Carroll	Rice	Richland
Morgan	Jo Daviess	Monroe	Pottawatomie	Frederick	Rock	Roosevelt
Otero	Kane	Montgomery	Pratt	Harford	Roseau	Rosebud
Ouray	Kendall	Noble	Rawlins	Howard	Scott	Sanders
Park	Knox	Orange	Republic	Montgomery	Sherburne	Sheridan
Phillips	La Salle	Putnam	Rice	Washington	Sibley	Silver Bow
Pitkin	Lee	Randolph	Riley		Stearns	Stillwater
Prowers	Livingston	Rush	Rooks	<b>MASS.</b>	Steele	Teton
Pueblo	Logan	Scott	Rush	Essex	Stevens	Toole
Rio Blanco	Macon	Shelby	Saline	Middlesex	Swift	Valley
San Miguel	Marshall	St. Joseph	Scott	Worcester	Todd	Wibaux
Summit	Mason	Steuben	Sheridan		Traverse	Yellowstone
Teller	McDonough	Tippecanoe	Sherman	<b>MICHIGAN</b>	Wabasha	
Washington	McLean	Tipton	Smith	Branch	Wadena	
Weld	Menard	Union	Stanton	Calhoun	Waseca	
Yuma	Mercer	Vermillion	Thomas	Cass	Washington	
	Morgan	Wabash	Trego	Hillsdale	Watonwan	

(continued)

APPENDIX F

TABLE AF101(1)—continued  
HIGH RADON-POTENTIAL (ZONE 1) COUNTIES<sup>a</sup>

<b>NEBRASKA</b>	Hunterdon	Belmont	Delaware	McPherson	Bland	Hancock
Adams	Mercer	Butler	Franklin	Miner	Botetourt	Hardy
Boone	Monmouth	Carroll	Fulton	Minnehaha	Bristol	Jefferson
Boyd	Morris	Champaign	Huntingdon	Moody	Brunswick	Marshall
Burt	Somerset	Clark	Indiana	Perkins	Buckingham	Mercer
Butler	Sussex	Clinton	Juniata	Potter	Buena Vista	Mineral
Cass	Warren	Columbiana	Lackawanna	Roberts	Campbell	Monongalia
Cedar		Coshocton	Lancaster	Sanborn	Chesterfield	Monroe
Clay	<b>NEW MEXICO</b>	Crawford	Lebanon	Spink	Clarke	Morgan
Colfax	Bernalillo	Darke	Lehigh	Stanley	Clifton Forge	Ohio
Cuming	Colfax	Delaware	Luzerne	Sully	Covington	Pendleton
Dakota	Mora	Fairfield	Lycoming	Turner	Craig	Pocahontas
Dixon	Rio Arriba	Fayette	Mifflin	Union	Cumberland	Preston
Dodge	San Miguel	Franklin	Monroe	Walworth	Danville	Summers
Douglas	Santa Fe	Greene	Montgomery	Yankton	Dinwiddie	Wetzel
Fillmore	Taos	Guernsey	Montour		Fairfax	
Franklin		Hamilton	Northampton	<b>TENNESSEE</b>	Falls Church	<b>WISCONSIN</b>
Frontier	<b>NEW YORK</b>	Hancock	Northumberland	Anderson	Fluvanna	Buffalo
Furnas	Albany	Hardin	Perry	Bedford	Frederick	Crawford
Gage	Allegany	Harrison	Schuykill	Blount	Fredericksburg	Dane
Gosper	Broome	Holmes	Snyder	Bradley	Giles	Dodge
Greeley	Cattaraugus	Huron	Sullivan	Claiborne	Goochland	Door
Hamilton	Cayuga	Jefferson	Susquehanna	Davidson	Harrisonburg	Fond du Lac
Harlan	Chautauqua	Knox	Tioga	Giles	Henry	Grant
Hayes	Chemung	Licking	Union	Grainger	Highland	Green
Hitchcock	Chenango	Logan	Venango	Greene	Lee	Green Lake
Hurston	Columbia	Madison	Westmoreland	Hamblen	Lexington	Iowa
Jefferson	Cortland	Marion	Wyoming	Hancock	Louisa	Jefferson
Johnson	Delaware	Mercer	York	Hawkins	Martinsville	Lafayette
Kearney	Dutchess	Miami		Hickman	Montgomery	Langlade
Knox	Erie	Montgomery	<b>RHODE ISLAND</b>	Humphreys	Nottoway	Marathon
Lancaster	Genesee	Morrow	Kent	Jackson	Orange	Menominee
Madison	Greene	Muskingum	Washington	Jefferson	Page	Pepin
Nance	Livingston	Perry		Knox	Patrick	Pierce
Nemaha	Madison	Pickaway	<b>S. CAROLINA</b>	Lawrence	Pittsylvania	Portage
Nuckolls	Onondaga	Pike	Greenville	Lewis	Powhatan	Richland
Otoe	Ontario	Preble		Lincoln	Pulaski	Rock
Pawnee	Orange	Richland	<b>S. DAKOTA</b>	Loudon	Radford	Shawano
Phelps	Otsego	Ross	Aurora	Marshall	Roanoke	St. Croix
Pierce	Putnam	Seneca	Beadle	Maury	Rockbridge	Vernon
Platte	Rensselaer	Shelby	Bon Homme	McMinn	Rockingham	Walworth
Polk	Schoharie	Stark	Brookings	Meigs	Russell	Washington
Red Willow	Schuyler	Summit	Brown	Monroe	Salem	Waukesha
Richardson	Seneca	Tuscarawas	Brule	Moore	Scott	Waupaca
Saline	Steuben	Union	Buffalo	Perry	Shenandoah	Wood
Sarpy	Sullivan	Van Wert	Campbell	Roane	Smyth	
Saunders	Tioga	Warren	Charles Mix	Rutherford	Spotsylvania	<b>WYOMING</b>
Seward	Tompkins	Wayne	Clark	Smith	Stafford	Albany
Stanton	Ulster	Wyandot	Clay	Sullivan	Staunton	Big Horn
Thayer	Washington		Codington	Trousdale	Tazewell	Campbell
Washington	Wyoming	<b>PENNSYLVANIA</b>	Corson	Union	Warren	Carbon
Wayne	Yates	Adams	Davison	Washington	Washington	Converse
Webster		Allegheny	Day	Wayne	Waynesboro	Crook
York	<b>N. CAROLINA</b>	Armstrong	Deuel	Williamson	Winchester	Fremont
	Alleghany	Beaver	Douglas	Wilson	Wythe	Goshen
<b>NEVADA</b>	Buncombe	Bedford	Edmunds			Hot Springs
Carson City	Cherokee	Berk	Faulk	<b>UTAH</b>	<b>WASHINGTON</b>	Johnson
Douglas	Henderson	Blair	Grant	Carbon	Clark	Laramie
Eureka	Mitchell	Bradford	Hamlin	Duchesne	Ferry	Lincoln
Lander	Rockingham	Bucks	Hand	Grand	Okanogan	Natrona
Lincoln	Transylvania	Butler	Hanson	Piute	Pend Oreille	Niobrara
Lyon	Watauga	Cameron	Hughes	Sanpete	Skamania	Park
Mineral		Carbon	Hutchinson	Sevier	Spokane	Sheridan
Pershing	<b>N. DAKOTA</b>	Centre	Hyde	Uintah	Stevens	Sublette
White Pine	All Counties	Chester	Jerauld			Sweetwater
	<b>OHIO</b>	Clarion	Kingsbury	<b>VIRGINIA</b>	<b>W. VIRGINIA</b>	Teton
<b>NEW HAMPSHIRE</b>	Adams	Clearfield	Lake	Alleghany	Berkeley	Uinta
Carroll	Allen	Clinton	Lincoln	Amelia	Brooke	Washakie
	Ashland	Columbia	Lyman	Appomattox	Grant	
<b>NEW JERSEY</b>	Auglaize	Cumberland	Marshall	Augusta	Greenbrier	
		Dauphin	McCook	Bath	Hampshire	

a. The EPA recommends that this county listing be supplemented with other available State and local data to further understand the radon potential of a Zone 1 area.

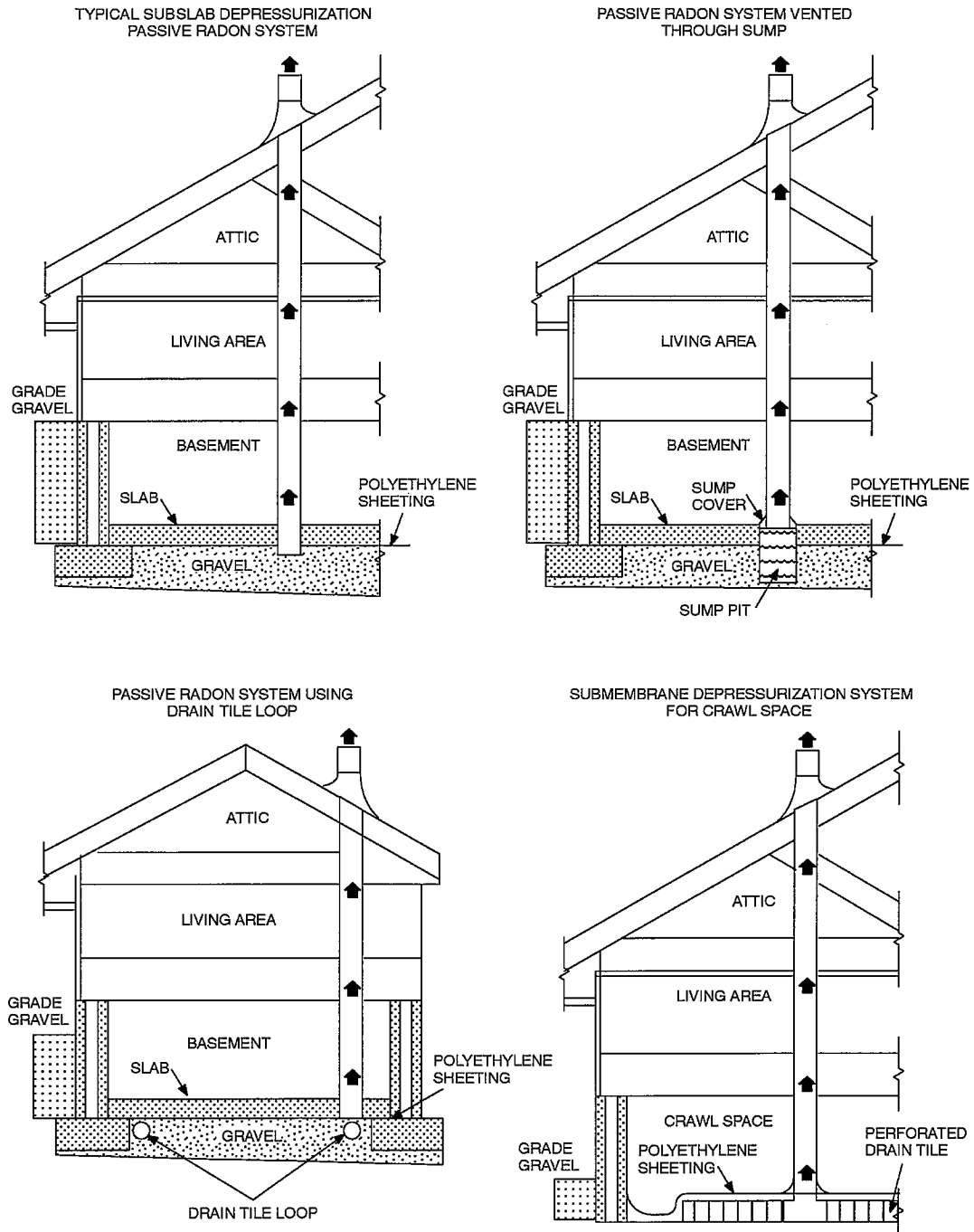


FIGURE AF102  
RADON-RESISTANT CONSTRUCTION DETAILS FOR FOUR FOUNDATION TYPES