

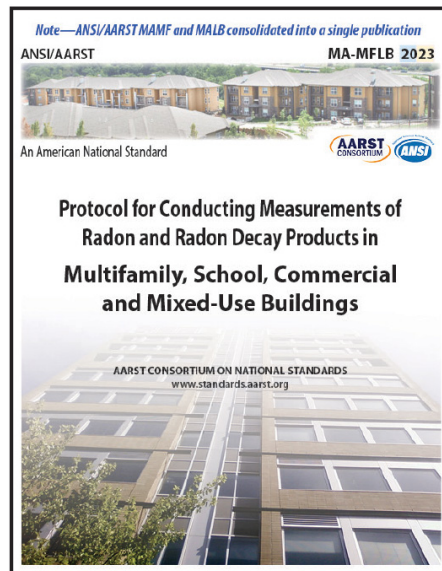
# Public Review of Proposed Addenda Updates to MA-MFLB 2023

Proposed addenda revisions to ANSI/AARST MA-MFLB are being published for public review.

## *Protocol for Conducting Measurements of Radon and Radon Decay Products in Multifamily, School, Commercial and Multi-Use Buildings*

This standard of practice specifies procedures and minimum requirements when measuring radon concentrations in shared structures, or portions of shared structures, used for residential, non-residential, or mixed-use purposes to determine if radon mitigation is necessary to protect current and future occupants.

ANSI/AARST standards are available for review and for purchase at [www.standards.aarst.org](http://www.standards.aarst.org). A link to ensure you receive future public review notices can be found at [www.standards.aarst.org/public-review](http://www.standards.aarst.org/public-review).



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Public Review: MA-MFLB addenda 12-24  
**COMMENT DEADLINE: January 20th, 2025**

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### REQUESTED PROCESS AND FORM FOR FORMAL PUBLIC REVIEW COMMENTS

Submittals (MS Word preferred) may be attached by email to [StandardsAssist@gmail.com](mailto:StandardsAssist@gmail.com)

- 1) Do not submit marked-up or highlighted copies of the entire document.
- 2) If a new provision is proposed, text of the proposed provision must be submitted in writing. If modification of a provision is proposed, the proposed text must be submitted utilizing the strikeout/underline format.
- 3) For substantiating statements: Be brief. Provide abstract of lengthy substantiation. (If appropriate, full text may be enclosed for project committee reference.)

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### REQUESTED FORMAT

Public Reviewed Item and Its Date: MA-MFLB addenda 12-24

- **Name:** Affiliation:
- **Clause or Subclause:**
- **Comment/Recommendation:**
- **Substantiating Statements:**  
*Repeat the four bullet items above for each comment.*

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527 N Justice Street, Hendersonville, NC 28739

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The consensus process developed for the AARST Consortium on National Radon Standards and as accredited to meet essential requirements for American National Standards by the American National Standards Institute (ANSI) has been applied throughout the process of approving this document.

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## TOPIC 1 CERTIFYING BODIES

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These revisions speak to closer compliance with ANSI requirements relative to how private sector certification programs are identified and relaxing the need for private sector certifications where the authority having jurisdiction (AHJ) also has a program to evaluate professional competence or test devices.

### 2.3 Test Devices

#### 2.3.1 *Approved test devices required*

All test devices used for deciding if mitigation is warranted shall be devices that are listed by one of the following authorities:

- a) As specifically required by ~~local jurisdictions~~ the authority having jurisdiction (AHJ) that have a program for evaluating and over approving devices; or
- b) ~~A national certification or listing program, such as the National Radon Proficiency Program (NRPP), the National Radon Safety Board (NRSB), or an equivalent program that verifies device compliance with the latest publication of ANSI/AARST MS-PC (Performance Specifications for Instrumentation Systems Designed to Measure Radon Gas in Air).~~

~~Note—Identification of two existing bodies that have a program for evaluating and listing devices that meet specified quality requirements is not an endorsement of either program.~~

- b) A national certification or listing program that verifies device compliance with the latest publication of ANSI/AARST MS-PC (Performance Specifications for Instrumentation Systems Designed to Measure Radon Gas in Air) or equivalent methods.<sup>1</sup>

footnote

<sup>1</sup> The National Radon Proficiency Program (NRPP) and the National Radon Safety Board (NRSB) are two programs nationally recognized in the United States by the U.S. Environmental Protection Agency (EPA) and other national stakeholders for:  
(1) evaluating the quality of radon measurement devices and instrument systems, and  
(2) publicly listing those verified to meet performance specifications as required in ANSI/AARST MS-PC (Performance Specifications for Instrumentation Systems Designed to Measure Radon Gas in Air).

Note—Identification of these private sector organizations is not an endorsement of either program.

### 2.4 Who Should Conduct the Testing?

To be considered qualified for ~~conducting~~ providing radon measurement services, measurement in multifamily, the person(s) or team, regardless of business organizational structure, shall operate under a quality assurance (QA) program. The QA program shall include individuals who are qualified for their apportioned task and operations conducted under the responsible charge of a qualified measurement professional.

#### 2.4.1 *Qualified measurement professionals*

~~For testing multifamily, school, commercial or mixed use buildings, a “Qualified Measurement Professional” is defined as:~~

~~“An individual that has demonstrated a minimum degree of appropriate technical knowledge and skills both sufficient to place, retrieve and analyze (as applicable) radon detectors and to design, plan, and implement quality procedures when conducting radon measurements in multifamily buildings, schools and other non-residential or mixed use buildings:~~

#### 2.4.1 *Qualified measurement professionals*

A “Qualified Measurement Professional” is defined as: “An individual holding a current credential for having demonstrated a minimum degree of appropriate technical knowledge and skills sufficient to place, retrieve and analyze (as applicable) radon detectors and to implement quality procedures when conducting radon measurements in homes:

- a) as established in certification requirements of a national program that is compliant with requirements in Normative **Appendix D**; ~~or and~~
- b) as required by ~~state, state~~ licensure or certification programs operating under an authority having jurisdiction (AHJ) that evaluates individuals for radon specific technical knowledge and skills.”

Informative Note: The qualified professional should be able to demonstrate a minimum degree of additional education relative to the most current version of this standard.

footnote \_\_\_\_\_

<sup>2</sup> The National Radon Proficiency Program (NRPP) and the National Radon Safety Board (NRSB) are two programs nationally recognized in the United States by the U.S. Environmental Protection Agency (EPA) and other public and private sector stakeholders to meet requirements in Normative Appendix D for evaluation of individuals and listing those who have demonstrated technical knowledge and skills sufficient to be certified as qualified measurement professionals.

Note—Identification of these private sector organizations is not an endorsement of either program

## **NORMATIVE APPENDIX D**

### **NATIONAL CERTIFICATION/LISTING PROGRAMS**

#### **D-1 National Certification/Listing Programs**

For private sector certifications of qualified measurement professionals identified in **Section 2.4**, this standard requires a national program that evaluates and lists qualified individuals, training courses and other products or services, such as laboratory services, integral to achieving public health goals intended by this standard. Programs meeting the purpose, need and requirements of this standard are those with policies as established in a), b) and c) of this **Appendix D**.

- a) Programs with published policies that:
  1. require persons to undergo education and an impartial examination process prior to granting personal certification or certificates of educational achievement; and
  2. require surveillance of continued competence, not less than as demonstrated by continuing education on standards updates, compliance and other related technical knowledge and skills, prior to granting recertification or renewed certificates or listings; and
  3. require, for the certification of radon measurement laboratories, initial demonstration and scheduled ongoing surveillance of compliance with **ANSI/AARST MS-QA** (Radon Measurement Systems Quality Assurance).
- b) Programs that:
  1. have a written policy and means for receiving and adjudicating complaints against individuals or companies who have been granted a credential; and
  2. have publicly published educational and examination requirements for each credential or listing available online where readily accessible for consumers of credentialed services.

b) Programs that include educational prerequisites as follow:

1. **Qualified Radon Measurement Professional—Homes**

Certifications granted that qualify individuals as proficient in conducting radon measurements in existing homes are to include:

- a. no less than 16 hours education prior to granting certification that focuses on tasks required in **ANSI/AARST MAH** (*Protocol for Conducting Measurements of Radon and Radon Decay Products in Homes*); and
- b. biennial recertifications after completing continuing education requirements and any other program surveillance activities.

2. **Qualified Radon Measurement Professional—Multifamily and Commercial**

Listing or certification credentials granted that qualify individuals as proficient in placement, retrieval, and analysis (as applicable) of *radon* detectors and to design, plan, and implement quality procedures when conducting *radon* measurements in multifamily, school, commercial and mixed-use buildings are to include:

- a. current certification as a qualified radon measurement professional in homes; and
- b. additional education and processes approved by the program relative to tasks required in the most current version of this standard **ANSI/AARST MA-MFLB** (*Protocol for Conducting Measurements of Radon and Radon Decay Products in Multifamily, School, Commercial and Multi-Use Buildings*) prior to granting this advanced level certification or listing and recertifications or relisting.

Informative Note 1—The National Radon Proficiency Program (NRPP), the National Radon Safety Board (NRSB), or equivalent programs that also meet requirements of a), b) and c) of this normative **Appendix D** meet the requirements of this standard.

Note that identification of existing certification bodies is not an endorsement of their programs.

Informative Note 2—The purpose of requirements in this **Appendix D** is to ensure contractors have an appropriate degree of technical, engineering, and scientific knowledge to protect occupants by providing reliable measurements of *radon gas* present in indoor air.

footnote \_\_\_\_\_

<sup>1</sup> The National Radon Proficiency Program (NRPP) and the National Radon Safety Board (NRSB) are two programs nationally recognized in the United States by the U.S. Environmental Protection Agency (EPA) and other public and private sector stakeholders to meet requirements in Appendix D for evaluation of individuals and listing those who have demonstrated technical knowledge and skills sufficient to be certified as qualified measurement professionals.

Note 1—Identification of these private sector organizations is not an endorsement of either program

Note 2—The purpose of requirements in this Appendix D is to ensure contractors have an appropriate degree of technical, engineering, and scientific knowledge to protect occupants by providing reliable measurements of *radon gas* present in indoor air.

## 9.0 DEFINITION OF TERMS

9.2x **Qualified Measurement Professional** n—As defined in Section 2.4.1.

**TOPIC 2 CLARITY ON WHEN MITIGATION IS RECOMMENDED**

<b>Table 5.3 Time-Sensitive Testing Option—Required Procedure and Summary</b>	
<b>Step 1 Options</b>	<i>Simultaneous Testing Option</i> Tests at each test location are conducted using two short-term test devices at the same time, 4 to 8 inches (10-20 cm) apart.
	<i>Continuous Monitor Option</i> Tests at each test location are conducted using a monitor that records retrievable hourly measurements.
	Evaluations of occupied versus unoccupied radon concentrations are additionally recommended for non-residential locations.
<b>Step 2</b>	<b>Decisions to Fix the Building</b>
	Mitigation decisions are to be based on the average result from a continuous monitor or the average of two test results conducted at the same time in the same location. <sup>1,2</sup>
	<p><b>Fix the building</b></p> <p>if test results <u>at any location in the building</u> meet or exceed the action level, e.g., 4 pCi/L. Consider fixing the building if results are greater than half the action level, e.g., between 2 and 4 pCi/L.</p>

<b>Table 5.4 Extended Testing Option—Required Procedure and Summary</b>	
<b>Step 1</b>	<i>Initial Test</i> Testing at each location is conducted using a single short-term device.
	Evaluations of occupied versus unoccupied radon concentrations are additionally recommended for non-residential locations.
<b>Step 2</b>	<i>Follow-up Test Options</i> Retest locations that meet or exceed the action level, e.g., 4 pCi/L. Follow-up testing requirements allow the following options: <sup>1,2</sup>
	a) A second test with a short-term device is conducted. Where a first test is twice the action level or greater, this confirmation test should be conducted without delay; or
	b) Where a first test is less than twice the action level, testing can be conducted with a long-term test device for an extended period if the situation allows a closer evaluation of annual average to radon concentrations; or
	c) Evaluation of occupied versus unoccupied radon concentrations for non-residential locations.
<b>Step 3</b>	<b>Decisions to Fix the Building</b>
	Mitigation decisions are to be based on the average of the two test results from short-term devices or the results from long-term testing <sup>3,4</sup>
	<p><b>Fix the building</b></p> <p>if test results <u>at any location in the building</u> meet or exceed the action level, e.g., 4 pCi/L. Consider fixing the building if results are greater than half the action level, e.g., between 2 and 4 pCi/L.</p>

## 9.0 DEFINITION OF TERMS

**9.2x Fix the Building** The process of reducing indoor radon concentrations to below the action level which requires whole building evaluation of mechanical systems and construction design in accordance with ANSI/AARST SGM-MFLB (Soil Gas Mitigation Standards for Multifamily, Schools, Commercial and Mixed-Use Buildings).

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### TOPIC 3

### FOLLOW-UP TESTING PROCEDURES

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These revisions speak to clarifying that follow-up testing procedures encompass more than simply one retest to validate test device accuracy. It is common when testing buildings that are shared by multiple dwellings and occupants, follow-up testing procedures include additional test events for ensuring the building is competently characterized for radon hazards.

## 6.0 CONDUCTING THE TEST

### 6.1.4 Failed closed conditions

Where compliance with closed-building conditions in **Section 4** did not occur for non-residential rooms, dwellings or untested ground-contact spaces, follow-up testing events ~~retest~~ procedures shall include retesting those rooms or dwellings and any tested rooms or dwellings:

- a) that immediately adjoin the side, above and below such locations, and
- b) that share the same heating or cooling air ducts.

## 8.0 TEST REPORTS

### 8.2.2 Summary of measurement results

Summary reports shall provide a summary of information that is pertinent to further actions or procedures that may be required relative to mitigation decisions, to include information required in a), b), c) and d) of this **Section 8.2.2**.

- a) Elevated concentrations  
Summary reports shall describe locations where test results meet or exceed the action level.
- b) Upper floors  
When elevated radon concentrations are found in upper floor test locations, summary reports shall clearly recommend that evaluations for determining the cause be conducted without delay. Procedures for conducting such evaluations are provided in Normative **Appendix C**.
- c) Follow-up testing event procedures remaining  
Summary reports shall identify all locations that still need to be tested or retested to comply with requirements in this standard, to include:
  1. confirmation testing to verify initial test results,
  2. testing in units or dwellings where valid measurements have not been achieved, and
  3. post-mitigation testing and clearance testing
- d) Unoccupied non-residential rooms  
Where nonresidential ground-contact locations, that are part of conditioned space, were not tested because they were not occupied, summary reports shall recommend either testing or that testing be conducted if occupied in the future.

**9.0 DEFINITION OF TERMS**

**9.2x Follow-up Testing Event Procedures**

Procedures for radon measurement events such as confirmation testing to verify initial test results, testing in units or dwellings where a valid measurement has not been achieved, post-mitigation and clearance testing, and other measurements conducted to better evaluate radon hazards.

**6.0 CONDUCTING THE TEST**

**6.2 Quality Control for Number of Valid Tests**

Unless it is decided at any juncture to proceed with mitigation, testing and follow-up testing event procedures shall continue until a valid test, compliant with all requirements of this standard, is achieved at all locations ~~intended~~ required by this standard to be tested.

~~Exception: Allowances shall be permitted due to inaccessible locations or missing detectors upon retrieval, to the extent allowed by requirements in a), b) and c) of this Section 6.2.~~

~~These allowances shall be applicable individually for two distinctly different areas within each building: (1) the number of required ground contact test locations, and (2) the number of tests required on upper floors.~~

Exception: As specified in Section 6.2.1 and compliant with Section 6.2.2. Allowances for missing valid tests in the assessment of radon hazards for each building shall be permitted due to inaccessible locations, missing detectors upon retrieval, less comprehensive initial testing, or other condition cited in Section 6.1.

- ~~a) Where all valid measurement results at the property are less than 4.0 pCi/L (150 Bq/m<sup>3</sup>) and all valid measurement results in the building are less than 2.7 pCi/L (100 Bq/m<sup>3</sup>), the number of missing valid tests shall not exceed the allowance in **Table 6.2.1**.<sup>3</sup>~~

**Table 6.2.1**

Test Locations:	3-5	6-10	9-11	12-16	15-20	18 or more
Allowance:	1	2	3	4	5	≤ 33%

- ~~b) Where any valid measurement at the property is 4.0 pCi/L (150 Bq/m<sup>3</sup>) or more, or where any valid measurement result in a building is 2.7 pCi/L (100 Bq/m<sup>3</sup>) or more, the number of missing valid tests for the property or for the building, respectively, shall not exceed the allowance in **Table 6.2.2**.<sup>4</sup>~~

**Table 6.2.2**

Test Locations:	<4	4-7	8-11	12-15	16-19	20 or more
Allowance:	0	1	2	3	4	≤ 25%

~~Note This allowance observes that the parcel of land where buildings reside has been shown to produce radon in soil sufficient to lead to elevated indoor radon concentrations.~~

- ~~c) An allowance is not extended for two side-by-side ground contact units or rooms that did not achieve a valid test, even though they were both intended to be tested.~~

<sup>3</sup> MIL-STD-105E, MILITARY STANDARD (1989): Sampling Procedures and Tables for Inspection by Attributes.

<sup>4</sup> Evaluating and Assessing Radon Testing in Housing with Multifamily Financing (EARTH).



### 6.2.1 Allowances for missing valid tests

The extent allowed for missing valid tests shall comply with a) or b) of this Section 6.2.1.<sup>5</sup> These allowances shall apply to determining next steps for additional follow-up testing event procedures and future assessments of the building.

#### a) Where lower concentrations are indicated

The number of missing valid tests shall not exceed 33% of required test locations so long as:

1. All valid measurement results in buildings at the property being tested are < 4.0 pCi/L (150 Bq/m<sup>3</sup>); and
2. All valid measurement results in the specific building tested are < 2.7 pCi/L (100 Bq/m<sup>3</sup>).

**Example Table For 6.2.1 a)**

Test Locations:	3-5	6-10	9-11	12-14	15-17	18 or more
Allowance:	1	2	3	4	5	≤ 33%

#### b) Where higher concentrations are indicated

The number of missing valid tests shall not exceed 25% of required test locations:

1. If any valid measurement in buildings at the property is ≥ 4.0 pCi/L (150 Bq/m<sup>3</sup>); or
2. If, for the specific building tested, any valid measurement result is ≥ 2.7 pCi/L (100 Bq/m<sup>3</sup>).

**Example Table For 6.2.1 b)**

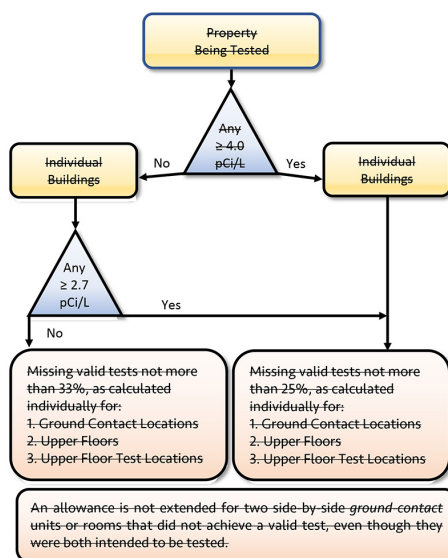
Test Locations:	< 4	4-7	8-11	12-15	16-19	20 or more
Allowance:	0	1	2	3	4	≤ 25%

6.2.1.1 An allowance is not extended at specific ground-contact locations where more than two side-by-side units or rooms required to be tested did not achieve a valid test.

### 6.2.2 Applicability of allowances

The calculations in Section 6.2.1 for allowed missing valid tests shall be met for each of the following different sets of data to be evaluated for each building:

1. the total number of required ground-contact test locations; and
2. the total number of test locations required on all upper floors.

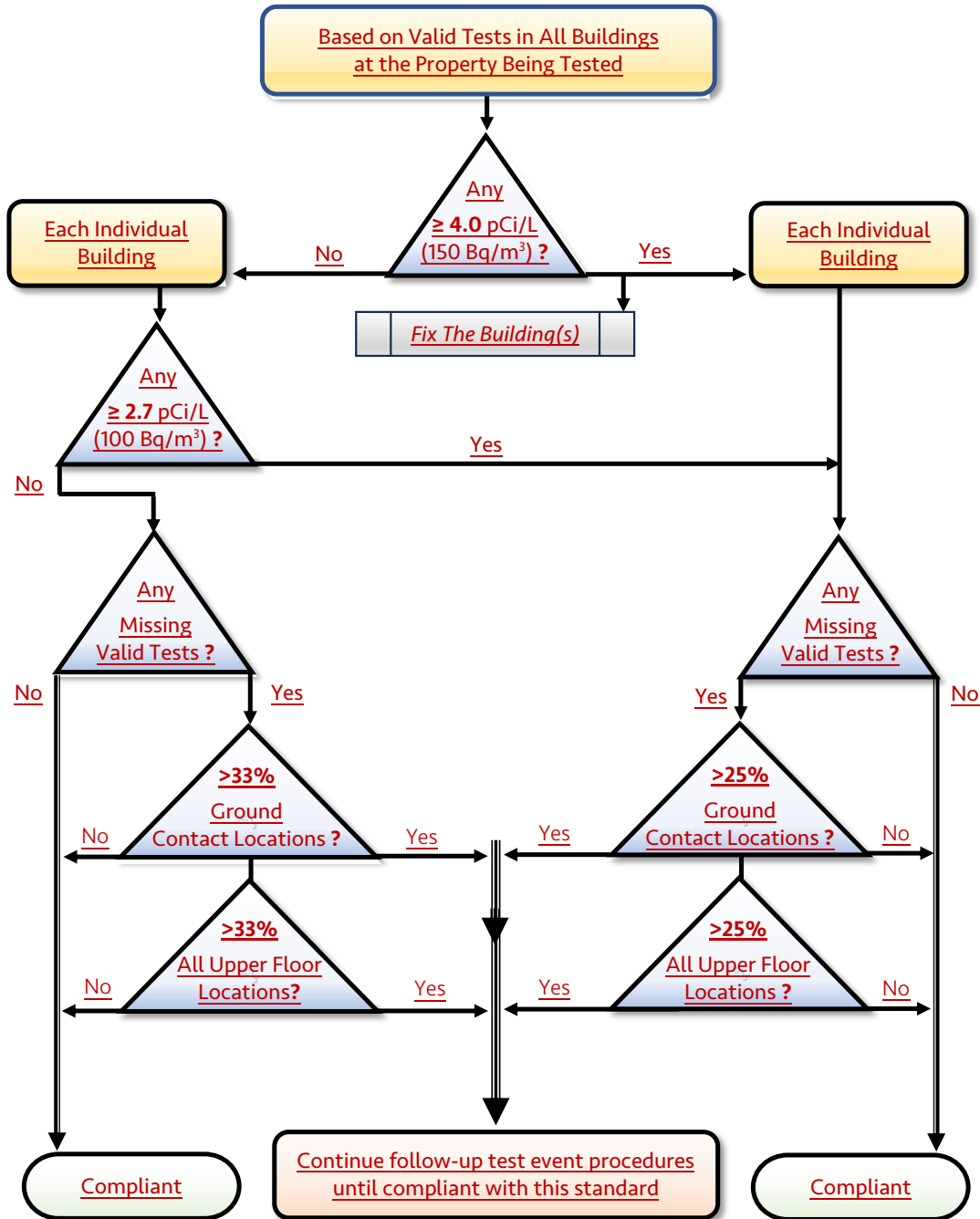


<sup>5</sup> MIL-STD-105E, MILITARY STANDARD (1989): Sampling Procedures and Tables for Inspection by Attributes.

<sup>5</sup> Evaluating and Assessing Radon Testing in Housing with Multifamily Financing (EARTH).

Figure 6.2

**Quality Control Flowchart for Minimum Number of Valid Tests**





**Repopulated Radon Measurement Committee (Consensus Body) 2024**

Non-voting Chair: Shawn Price (NH)

Non-voting Assist Team: Gary Hodgden (KS)

Stakeholder Group	Delegate	Affiliation
(Educators)	David Metzger (OH)	Spruce Environmental
(Non-Regulated States)	Amanda Parkins (CT)	Minnesota Department of Health
(Non-Regulated State <i>alternate</i> )	Michael Gustafson (MT)	Montana Radon Control Program
(Regulated States)	Deborah Madsen (MN)	Connecticut Department of Public Health
(Regulated States <i>alternate</i> )	Stacy Sowers (PA)	Pennsylvania Dept. of Environmental Protection
(Proficiency Program)	Kyle Hoylman (KY)	National Radon Proficiency Program
(Proficiency Program <i>alternate</i> )	Nancy Bredhoff (NY)	National Radon Safety Board
(Federal Government)	Tommy Bowles (DC)	U.S. Environmental Protection Agency
(Public Health NGO)	Kevin Stewart (PA)	American Lung Association
(Consumer Interests)	Derek Cooper (GA)	University of Georgia
(Home Inspectors)	Tom Chartrand (AZ)	Home Inspection Professional
(Home Inspectors <i>alternate</i> )	Nate Burden (PA)	Home Inspection Professional
(Mitigation professionals)	David Coffey (TN)	Professional Service Provider
(Home Measurement)	Maria Stinger (PA)	Professional Service Provider
(Home Measurement <i>alternate</i> )	Tom Wilson (NE)	Professional Service Provider
(Multifamily Measurement)	Kim Dingleline (VA)	Professional Service Provider
(Multifamily Meas. <i>alternate</i> )	Jessica Karnes (OH)	Professional Service Provider
(Large Bldg. Measurement)	Ken Deemer (PA)	Professional Service Provider
(Environmental Consulting)	Myca Bruno (NC)	Professional Service Provider
(Environmental Cons. <i>alternate</i> )	Rusty Vaughn (CA)	Professional Service Provider
(Building Scientist)	Bruce Fergusson (KY)	Professional Service Provider
(Health Scientist)	Michael LaFontaine (ON)	Physics Solutions Inc.
(Health Scientist <i>alternate</i> )	John Neuberger (KS)	University of Kansas Medical Center
(Device Manufacturers)	Alex Stieff (MD)	Rad Elec, Inc.
(Manufacturers <i>alternate</i> )	Carlos Avery (NJ)	Envirolabs, Inc.
(Radon Chambers)	Brian Hansen (KS)	Kansas State University