

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

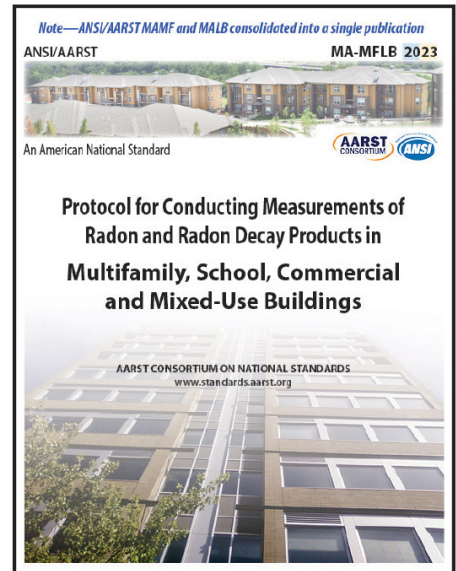
Additional proposed addenda revisions to ANSI/AARST MA-MFLB are being published for public review:

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. A link to ensure you receive future public review notices can be found at www.standards.aarst.org/public-review.

Public Review: MA-MFLB addenda 26-9
COMMENT DEADLINE: Nov. 23rd, 2026



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AARST Consortium on National Standards

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The Consortium Consensus Process

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.

Continuous Maintenance

This standard is under continuous maintenance by the AARST Consortium on National Standards for which the Executive Stakeholder Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the standard.

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TOPIC 1

CLIENT REQUEST

This revision does not remove related legal obligations but removes a minimum requirement to request when and who measurement reports and data are allowed to be shared with occupants or other third parties.

2.6.3 Client authorizations

Note—Prior to testing, the client ~~shall~~ **should** be requested in writing to provide confirmation regarding:

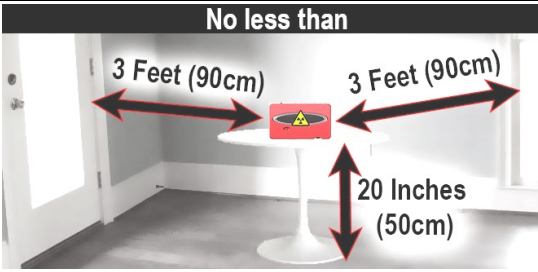
- a) who is authorized by the client to receive test data and any limits the client requests or requires on disclosing test data or results, and
- b) at which junctures during the process that the client requests or requires data to be provided.

Note—**Exhibit 1** provides an example form for seeking to obtain client authorizations.

TOPIC 2

TESTS CONDUCTED NEAR DRAINS

These revisions add a distance between test devices and observable and potential openings to soil.

Table 3.8 Requirements for Test Locations Within a Room	
Detectors shall be located NOT less than:	3 feet (90 cm) from exterior doors, windows or other potential openings to the outdoors. <u>3 feet (90 cm) from large openings to soil and any plumbing drains and floor drains.</u>
	20 inches (50 cm) above the floor.
	1 foot (30 cm) from the exterior wall of the building.
	1 foot (30 cm) below the ceiling.
	

TOPIC 3 ERV

These revisions attempt to clarify concerns when HVAC equipment is temporarily adding ventilation that is a condition that is not representative of average occupied conditions.

4.1 Closed-Building Protocol Requirements

Closed-building conditions, as they are for occupied conditions in winter heating seasons or summer cooling seasons, are required when short-term test results are used for mitigation decisions. Closed-building conditions in accordance with **Tables 4-A, 4-B** and **Exhibit 1** are required to be:

- initiated 12 hours prior to the test for tests lasting less than 72 hours; and
- maintained throughout the test period for tests lasting 2 to 90 days.

Table 4-A ESSENTIAL CLOSED-BUILDING PROTOCOL REQUIREMENTS	
Windows	Keep closed on all levels of the building including areas not being tested
Exterior doors (except for momentary entry and exit)	
Heating and cooling systems	Set to normal occupied operating conditions with temperature settings between 65° and 80° F (18° - 27° C)
~~Systems that temporarily ventilate with outdoor air for seasonal comfort or energy savings~~ <u>Equipment that, for seasonal comfort or energy savings, increases the amount of outdoor air entering the building</u>	~~Set to the lowest seasonal ventilation~~ <u>Do not operate unless set to operate only at the lowest ventilation rate that occurs most of the year</u>

Table 4-C ADDITIONAL CLARIFICATION ON CLOSED BUILDING PROTOCOL REQUIREMENTS FOR SPECIFIC COMPONENTS	
Windows and Doors on all levels of the building including areas not being tested	
Small Appliances	
Crawl Spaces	
Mechanical Systems	
Passive vents for combustion air makeup	Leave open
Combustion appliance fans	Operate normally
Fans installed in attics to ventilate only attic air	

Window air conditioners	Operate in recirculation mode only
Evaporative cooling systems	Do not operate and do not cover
Equipment that, for seasonal comfort or energy savings, increases the amount of outdoor air entering the building. Examples include HVAC economizer systems, energy recovery ventilators or heat recovery ventilators	Operation of permanently installed ventilation systems that bring outdoor air into the building is only permitted to continue during the test so long as: a) the system is set to the lowest ventilation condition that occurs most the year and b) all thermostats in the building are set to normal occupiable temperatures.

TOPIC 4

CONTINUOUS MONITORS HOURLY DATA

These revisions clarify issues about disclosure of hourly data in reporting and hours not reported.

8.4.2 Continuous Monitors

Additional requirements for continuous radon monitor test results include:

- a) hourly data ~~shall either be included in the test report or provided to the client upon request;~~
- b) ~~the calibration date of continuous monitor(s) shall be included on the test report; and~~
- b) the expiration date that is one year after the instrument's most recent calibration shall be included on the test report; and
- c) removal of portions of hourly data imbedded within the contiguous sampling period reported (such as to account for weather or other conditions) **shall** invalidate the measurement.

Exceptions:

1. The first 4 hours of data after starting a test are to not be used ~~be discarded~~ in calculating the reported test result or incorporated into the result using system correction factors (EPA 402-R-92-004, EPA 1992);
2. The first 12 or more hours after starting a test are to not be used ~~be discarded~~ in calculating the reported test result average ~~as required~~ for meeting closed-building requirements in Sections 4, 6.1.2 and 7.3.2 b; and
3. The first 24 or more hours after starting a test are to not be used ~~be discarded~~ in calculating the reported test result average as required in Section 7.3.2 b after activation of a mitigation system fan or completion of other mitigation efforts, for evaluation of post-mitigation effectiveness.

8.4.2.1 Where hourly data is not used in calculating the reported test result average, the report shall include a statement for which data was not used and the reason why.

These revisions seek to facilitate reporting conditions that may influence test results to not reflect occupant risk.

8.2.3 Reliability of the measurements

Summary reports **shall** provide statements regarding reliability and shortcomings of the measurement procedures in accordance with requirements a), b), c), d) and e) of this **Section 8.2.3**.

Detailed elaboration is permitted to be included in summary report attachments.

a) Quality Assurance Summary Statements

A summary statement regarding QC measurements **shall** be provided that conveys:

1. Confirmation of compliance with QC measurements requirements; and
2. Descriptions of any QC measurements that were missing or fell outside of control tolerances established in ANSI/AARST MS-QA (Radon Measurement Systems Quality Assurance).

b) Test Conditions

An advisory and description **shall** be included in the summary report for any of the observed building conditions identified in Table 8.2.3-b that may cause the test to not reflect occupant risk from radon. To facilitate this requirement, quality control records when testing for durations lasting 90 days or less **shall** include records of observed test conditions, as specified in Table 8.2.3-b. These test event records, to include any actions taken to achieve protocol compliance **shall** be either included in the test report or provided to the client upon request.

9.x Long-Term Tests

Radon measurements conducted for a duration of 91 days or longer. Test durations of 90.5 days qualify as being equal to 91 days.

Table 8.2.3-b Quality Control Records / Test Conditions		<i>Example Test Event Log Y = to report</i>
<u>Temporary Conditions</u>		
1.	<u>The property, a dwelling or portion of the building tested was not operated under occupied operating conditions</u>	<u>☐Y ☐N ☐NA ☐U</u>
2.	<u>Systems were temporarily ventilating with outdoor air for seasonal comfort or energy savings during the test period, including:</u>	<u>☐Y ☐N ☐NA ☐U</u>
	<u>a. Closable passive crawl space vents that were open during the test but would be closed more than 50% of the year for energy savings, comfort or to prevent frozen pipes,</u>	<u>☐Y ☐N ☐NA ☐U</u>
	<u>b. Window air conditioners did not have closed outside air dampers,</u>	<u>☐Y ☐N ☐NA ☐U</u>
	<u>c. Evaporative cooling systems were operating or not covered,</u>	<u>☐Y ☐N ☐NA ☐U</u>
	<u>d. Energy recovery ventilators, heat recovery ventilators or economizer ventilation systems:</u>	<u>☐Y ☐N ☐NA ☐U</u>
	<u>— Was an ERV or HRV operating.</u>	<u>☐Y ☐N ☐NA ☐U</u>

	<u>If so, what was the system ventilation setting</u> <u>– not all thermostats in areas served by these systems were set to</u> <u>normal occupiable temperatures.</u>	<u>Y N NA U</u>
3.	<u>Sub-slab return ducts were observed.</u>	<u>Y N NA U</u>
4.	<u>Weather events occurred that were unusually severe for local weather.</u>	<u>Y N NA U</u>
Deviations from Protocol		
1.	<u>Observed noncompliance with required conditions, such as closed-building conditions 12 hours prior to, or during the test period.</u>	<u>Y N NA U</u>
2.	<u>Observed deviation(s) from a normal occupiable indoor temperature.</u>	<u>Y N NA U</u>
3.	<u>Noninterference controls indicate concerns regarding protocol compliance.</u> <u>Note—Non-interference controls can include moved devices, compromised tamper seals and observed anomalies in test data.</u>	<u>Y N NA U</u>
4.	<u>Non-interference agreement(s) not signed or refusal to sign such agreement.</u>	<u>Y N NA U</u>

Note—For this example method of logging observed conditions: Y=yes, N=no, NA=not applicable and U=unknown.

TOPIC 6

MITIGATION OBSERVATIONS

These revisions clarify how observance of mitigation systems are to be reported.

c) Radon Mitigation System Status (if applicable)

Where a mitigation system or efforts to mitigate radon are observed, the test report **shall** include:

- 1.) a statement that a mitigation system was observed and whether it appeared to be operating,
- 2.) a statement regarding the condition of any temporary or passive radon mitigation strategies that are not permanent installations, **as defined in Table 8.2.3-c**. A statement in the report that the test company offers no findings as to the proper installation and effectiveness of the mitigation system is permitted.

Quality control records when testing buildings shall include records of observed test conditions, as specified in Table 8.2.3 c.

Table 8.2.3 c	Quality Control Records / Mitigation Systems or Efforts	Example Test Event Log
ASD System(s)		
1.	<u>Did you witness an ASD mitigation system?</u>	<u>Y N</u>
2.	<u>Did it appear to be operating?</u>	<u>Y N U</u>
3.	<u>Any concerns observed?</u>	<u>Specify</u>
Other mitigation systems/efforts		
1.	<u>Did you witness a passive mitigation system?</u>	<u>Y N U</u>
2.	<u>Did you witness active mitigation efforts that were not ASD?</u>	<u>Y N U</u>
3.	<u>Did you witness any temporary mitigation efforts that are not permanent modifications to the building?</u>	<u>Y N U</u>
4.	<u>Any concerns observed?</u>	<u>Specify</u>

Note—For this example method of logging observed conditions: Y=yes, N=no, and U=unknown.

~~b) Temporary Conditions~~

~~—Where temporary building conditions or other factors are observed that are known or suspected to cause a test to not reflect occupant risk from radon, summary reports **shall** recommend retesting the affected location(s). Temporary conditions subject to this requirement include:~~

- ~~1. The property, dwelling or portion of the building tested was not operated under occupied operating conditions because it was vacant during the test period;~~
- ~~2. Systems were temporarily ventilating with outdoor air for seasonal comfort or energy savings during the test period, including:~~
 - ~~a. Closable passive crawl space vents that were open during the test but would be closed more than 50% of the year for energy savings, comfort or to prevent frozen pipes;~~
 - ~~b. Window air conditioners did not have closed outside air dampers during the test period;~~
 - ~~c. Evaporative cooling systems were operating or not covered during the test period;~~
 - ~~d. Energy recovery ventilators, heat recovery ventilators or economizer ventilation systems were operating under one or both of the following conditions:~~
 - ~~— the system was not set to the lowest outdoor air ventilation rate that occurs during all seasons;~~
 - ~~— not all thermostats in areas served by these systems were set to normal occupiable temperatures;~~
- ~~3. Sub-slab return ducts observed, and minimal air handler activity occurred during the test; and~~
- ~~4. If weather events occurred that were unusually severe for local weather.~~

~~e) Deviations From Protocol~~

~~Where deviations from this standard were observed that are known or suspected to cause a test to not reflect occupant risk from radon, summary reports **shall** recommend retesting the affected location(s). Deviations from protocol subject to this requirement include, but are not limited to:~~

- ~~1. observed noncompliance with required conditions, such as closed-building conditions 12 hours prior to, or during the test period;~~
- ~~2. observed deviation from a normal occupiable indoor temperature; and~~
- ~~3. where noninterference controls indicate concerns regarding protocol compliance.~~

~~d) Radon Mitigation System Status (if applicable)~~

~~—Where a mitigation system or efforts to mitigate radon are observed, summary reports **shall** include:~~

- ~~1. a statement that a mitigation system was observed and whether it appeared to be operating;~~
- ~~2. a statement regarding the condition of any temporary radon mitigation strategies that are not permanent installations; and~~
- ~~3. a statement on the limits of the inspection. It is permitted to provide a statement in the report that the test company offers no findings as to the proper installation and operation of the mitigation system.~~

These revisions clarify a required location for post-mitigation and other test locations to consider.

7.3.3 Clearance Testing

Clearance testing to verify all portions of a building are below the action level ~~shall~~ comply with all requirements in a) and b) of this **Section 7.3.3**.

a) Test Locations

1. ~~Test locations shall include all ground-contact dwellings and non-residential rooms, in accordance with Section 3 (Test Locations), to include not less than 10% of the dwellings and non-residential rooms on each upper floor; and~~
2. ~~Where any active soil depressurization (ASD) system exhausts below the roof, a test shall also be conducted in the room(s) immediately adjoining the outside exhaust location;~~

These revisions clarify the difference between required retests and retests recommended when the degree changed conditions may be more difficult to pinpoint.

Table 8-B	Reporting Low Concentrations
EQUIVALENT STATEMENTS FOR THESE ADVISORIES SHALL BE INCLUDED IN THE REPORT	
- Consider fixing the building if test results indicate radon concentrations greater than half the action level, (e.g., between 2 and 4 pCi/L). - Note that tests conducted when heating systems are active both day and night are more likely to provide a clear characterization of potential radon hazards.	
<i>Advisories required regarding continued protection against long-term exposure to a radon hazard</i>	
- Retest the building at least every 5 years or, to verify continued effectiveness of radon mitigation systems or efforts, at least every 2 years. - Retest in conjunction with any sale of new or existing buildings. ~~In addition, be certain to test again when any of the following circumstances occur:~~ <u>Retest after</u> a new addition is constructed or alterations for building reconfiguration or rehabilitation occur; <u>Retest if</u> a ground contact area not previously tested is occupied, or a home is newly occupied. <u>Where the following changes to the structure are observed and substantial, testing to verify continued low exposure to radon gas should be considered:</u> ✓ heating or cooling systems are significantly altered, resulting in changes to air pressures or pressure relationships; ✓ ventilation is significantly altered by extensive weatherization, changes to mechanical systems or comparable procedures; ✓ significant openings to soil occur due to: – groundwater or slab surface water control systems that are altered or added, ~~(e.g.,~~ such as sumps, perimeter drain tile, shower/tub retrofits, etc.; or, – natural settlement causing major cracks to develop; ✓ earthquakes, construction blasting, or formation of sink holes nearby; or ✓ a mitigation system is altered, <u>or</u> modified ~~or repaired~~.	

TOPIC 9

TEST LIMITATIONS

These revisions speak to clarifying minimum requirements

8.5 e) Statement of Test Limitations

The report **shall** describe the general limitations of the test. An example is the following statement: "There is an uncertainty with any measurement result due to a variety of factors that cause daily and seasonal variations in radon concentrations. Such factors may include changes in the weather, operation of the dwelling, or even possible interference with the necessary test conditions."

These revisions replace the term “normal” with a more clear descriptions and add or clarify a few follow-up testing procedures

2.2.1 *Where occupied both day and night*

Radon testing is permitted any time of year for locations that are residential or significantly occupied both day and night.

Informative Advisory—Measurements are more likely to provide an accurate reflection of occupant exposure to radon hazards when conducted under conditions that most closely align to the ~~normal~~ building operating conditions that last the longest each year. ~~condition that prevails during the greatest amount of time each year.~~ See Normative Appendix A for information on how to determine when testing should occur.

2.2.2 *Where not occupied both day and night*

For buildings or areas that are non-residential and not *significantly occupied* both day and night, measurements shall be taken at times that are representative of building operating conditions that last the longest each year for similar local buildings when they are significantly occupied. Refer to **Section 2.7.2 (Building operating conditions)** for details.

a time that is representative of normal occupied building operating conditions

Exception: It shall be permitted to test at any time of the year when the purpose of the testing demands timeliness, such as a business transaction or health concerns. If choosing this option however, clients shall be notified in writing before testing that evaluations for radon hazards will not be conclusive where test results are below the action level. Where test results are below the action level, test reports and any plans for operation, maintenance and monitoring (OM&M) shall identify the locations and state that test results are not conclusive ~~evaluations for radon hazards are not complete unless additional testing is conducted at these locations:~~

- a) within 1 year after initial testing or assumption of OM&M duties where testing has not been conducted under conditions that represent the building operating conditions that last the longest each year, as defined in Section 2.7.2 (Building operating conditions) ; and
- b) no less than every 5 years.

2.6.2 *Client advisories prior to testing*

During initial interactions or in proposals, the client shall be informed in writing regarding;

- a) Test plan options that comply with this standard;
- b) Required quality control for closed building conditions;
- c) The building operating conditions that last the longest each year when occupied for similar local buildings, in accordance with Appendix A; and

~~The normal occupied building operating condition that prevails during the greatest amount of time each year~~

2.7.2 Building operating conditions

To plan for testing, one shall identify building operating conditions that last the longest each year when building is occupied, in accordance with climate tables in Appendix A.

Note—One should also identify conditions that hinder clear characterization of radon hazards that include:

- a) Days when outdoor temperatures result in little to no activity of heating or cooling systems fans or blowers, and
- b) Days when indoor and outdoor temperatures are almost the same.

~~Planning and conducting measurements require identification of the normal occupied building operating condition that prevails during the greatest amount of time each year. The predominant building operating condition reported and used for testing procedures shall be based on climate examples in accordance with Appendix A.~~

~~Planning and conducting measurements additionally require identification of conditions that temporarily inhibit clear characterization of radon hazards. These are conditions that do not exhibit regularity for at least intermittent periods during a test regarding:~~

- ~~a) Activity of heating or cooling system blowers, where applicable to the HVAC system, and~~
- ~~b) Negative air pressure in the lowest portions of the building relative to outside air.~~

5.1.4 Longer test periods

When longer test periods are chosen with intent to more closely evaluate the annual average radon concentration before deciding if mitigation is warranted, the test period shall include heating season conditions that are not less than the percentage of year when heating systems are active.

Exception: Where heating season conditions are not the building operating conditions that last the longest each year when the building is occupied, ~~normal occupied building operating condition~~

as defined in Normative Appendix A.

7.2.2 Where test results disagree on exceeding the action level

- b) Not Acceptable

If the higher test result is more than twice the lower test result:

1. For two collocated (side-by-side) tests conducted at the same time, a repeated collocated test at this location is required to get a valid measurement; and
2. For two short-term tests conducted at different times in the same location, the higher test result shall be regarded as correct for making mitigation decisions unless the lower result is:
 - a. confirmed by additional testing initiated within 1 year that is conducted under conditions that closely match the building operating condition(s) that last the longest each year when the building is occupied ~~predominant normal occupied building operating condition, as defined in Section 2.7.2; or~~
 - b. confirmed by comparing radon concentrations under significantly occupied conditions compared to unoccupied conditions.

One of these required testing procedures shall be provided in test reports per Section 8.2.2 c (Follow-up testing procedures remaining).

8.0 TEST REPORTS

8.2.5 Low Radon Concentrations

b) Seasonal reliability

If not already accounted for, additional testing shall be recommended, no later than within the first year after occupancy or ownership of property management, where:

1. Testing was not conducted under conditions that are representative of the building operating conditions that last the longest each year when the building is occupied ~~normal-occupied~~ building operating condition that prevails during the greatest amount of time each year; or

NORMATIVE APPENDIX A - REPORTING REQUIREMENTS FOR BUILDING OPERATING CONDITIONS

A-1.0 Reporting Operating Condition Comparisons

Data from the applicable climate table(s) in this **Appendix A, Tables A-1 through A-8**, shall be provided for reporting the building operating conditions that last the longest each year when the building is occupied ~~normal-occupied building operating condition(s)~~ for buildings and unique sectors within a building.

A- 1.1 Data and format

Table A-1 specifies data and information that shall be reported. Information that compares the building operating conditions that last the longest each year when the building is occupied ~~normal-occupied building operating conditions~~ to the operating conditions that occurred during a test shall be portrayed together for easy comparison, such as in **Table A**

9.0 DEFINITION OF TERMS

<u>9.3x Building Operating Conditions</u>	<u>Conditions where maintaining occupant comfort results in active heating systems, active cooling systems or simply intermittent use of HVAC systems and ventilation.</u>
9.39 ~~Normal Occupied~~ Operating Condition	The operational condition for the building or unique sector of the building that exists during the greatest amount of significantly occupied time <u>each year</u> . See <u>"Significantly occupied"</u> <u>See Annex A, Tables A-1 through A-8</u>
9.42 Occupied Work or School Weeks	Those weeks that do not include vacation days such as national or religious holidays, winter breaks or similar weeks where test conditions do not <u>reflect building operating conditions that last the longest each year when the building is occupied.</u> ~~normal-occupied operating conditions for the building. See "Normal Occupied Operating Condition",~~ See "Occupied" and "Significantly Occupied"