

Harmonization and Update effort for
MAH, MAMF and MALB Measurement Standards

Continuous maintenance efforts to improve these standards are currently ongoing.



MAMF- MALB Updates 5/22 Read me

These proposed revisions updates testing provisions that include locations with invalid tests and reporting them, and updates to Appendix C to improve clarity. The proposed revisions are applicable to the following ANSI/AARST publications:

- MAMF 2017 rev.1-21
- MALB 2014 rev.1-21

Latest published versions of those standards are available for comparison at www.standards.aarst.org where all ANSI/AARST standards can be found for review at no charge and for purchase.

The current mitigation standards committee roster (consensus body) can be linked to from www.standards.aarst.org/public-review. The current work project includes (1) harmonization, where possible, for all portions of these documents to read the same for the same tasks; (2) update based on new experiences, and (3) renderings that are more conducive to stakeholders who are involved in compliance assessment.

Public Review: MAMF/MALB Updates 6-22
COMMENT DEADLINE: August 1st, 2022

REQUESTED PROCESS AND FORM FOR FORMAL PUBLIC REVIEW COMMENTS

Submittals (MS Word preferred) may be attached by email to 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.)

REQUESTED FORMAT

Title of Public Review Draft: **MAMF/MALB Updates 6-22**

- **Name:** _____ **Affiliation:** _____

 - **Clause or Subclause:** _____

 - **Comment/Recommendation:** _____

 - **Substantiating Statements:** _____
- Check here if your comment is supportive in nature and does not require substantive changes in the current proposal in order to resolve your comment.

Repeat the five bullet items above for each comment.

Requested registration of your contact information and copyright release.

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Notice regarding unresolved objections: While each committee seeks to resolve objections, please notify the committee responsible for an action or inaction if you desire to recirculate any unresolved objections to the committee for further consideration. Notice of right to appeal. (See Bylaws for the AARST Consortium on National Radon Standards - Operating Procedures for Appeals available at www.radonstandards.us, Standards Forum, Bylaws): (2.1) Persons or representatives who have materially affected interests and who have been or will be adversely affected by any substantive or procedural action or inaction by AARST Consortium on National Radon Standards committee(s), committee participant(s), or AARST have the right to appeal; (3.1) Appeals shall first be directed to the committee responsible for the action or inaction.

AARST Consortium on National Radon 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 Radon 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.

User Tools: User tools are posted online (www.standards.aarst.org/public-review) as they become available (such as templates for field notices, inspection forms, interpretations and approved addenda updates across time).

Notices

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Proposed Maintenance Updates for MAMF/MALB 05/22

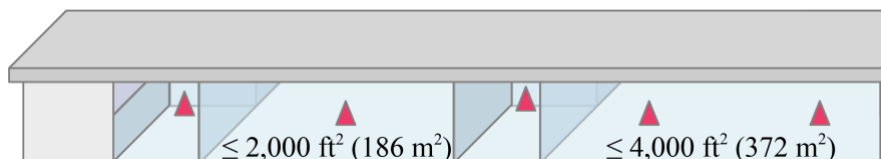
Protocol for Conducting Measurements of Radon and Radon Decay Products in Multifamily, School, Commercial or Mixed-Use Buildings

Commentary/Rationale: The proposed revision to Section 3.4 is to reduce confusion.

3.4 Large Rooms or Open Plan Design Areas

For large rooms and open plan designed areas that may include partitioned rooms that do not have closeable doors may exist, one or more detectors shall be placed for every 2,000 square feet (186 m²) of the room or open area and for any remaining portion of the area that is less than 2,000 square feet (186 m²).

Figure 3 E
2,000 Sq. Ft.



3.4.1 ~~Open-Plan or Pod Design~~

Where an open-plan or pod design area has moveable walls that can physically separate an area into individual rooms, the movable walls shall be configured to divide the area into individual rooms and each resulting room shall be measured separately. Where moveable walls are absent or inoperable, the area shall be measured as one room.

Commentary/Rationale: The proposed revision to Section 6.1.2 was observed to achieve virtually the same goal while allowing more practical application in the field.

6.0 CONDUCTING THE TEST

6.1.2 ~~Where closed-building conditions did not occur prior to the test~~

Where closed-building conditions were not maintained for twelve hours prior to deployment, as required in Section 4, the radon testing shall be conducted with one of the following options:

- The testing is postponed until at least 12 hours of closed-building conditions have been maintained prior to initiating the test; or
- ~~The test period is extended to 4 days or more after closed-building conditions are initiated;~~
- The test period extends not less than 72 hours after closed-building conditions are initiated;

Commentary/Rationale: The proposed replacement to Section 6.2 is to refine requirements for the minimum number of valid tests relative to what information from initial or previous testing steps reveals regarding the parcel of land where buildings reside.

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

~~For dwellings or non-residential rooms where access problems, test conditions, or other reasons or situations prevented achieving a valid test result, follow-up procedures shall include testing all locations that were intended to be tested but did not result in valid measurements.~~

~~6.2.1 Test procedures shall continue until a valid test is achieved at all locations that were intended to be tested unless it is decided to proceed with mitigation or,~~

~~Exception: Where both of the following conditions are met:~~

- a) ~~The number of missing valid tests in *ground-contact* locations of the building does not exceed the allowance provided in [Table 6.2](#); and~~
- b) ~~All other test locations in the building are less than 2.0 (75 Bq/m³).~~

~~Table 6.2~~

<i>Ground-contact</i> Test Locations:	4-7	8-11	12-15	16-19	20 or more
Allowance:	1	2	3	4	5

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* shall continue until a valid test, compliant with all requirements of this standard, is achieved at all locations intended 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.

- a) Where all valid measurement results at the *property* are less than 4.0 pCi/L (150 Bq/m³) and all valid measurement results in the building are less than 2.7 pCi/L (100 Bq/m³), the number of missing valid tests shall not exceed the allowance in Table 6.2.1.

Table 6.2.1 < 2.7 pCi/L (100 Bq/m³)

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

- b) Where any valid measurement results at the *property* are 4.0 pCi/L (150 Bq/m³) or more, or any valid measurement results in the building is 2.7 pCi/L (100 Bq/m³) or more, the number of missing valid tests shall not exceed the allowance in Table 6.2.2.

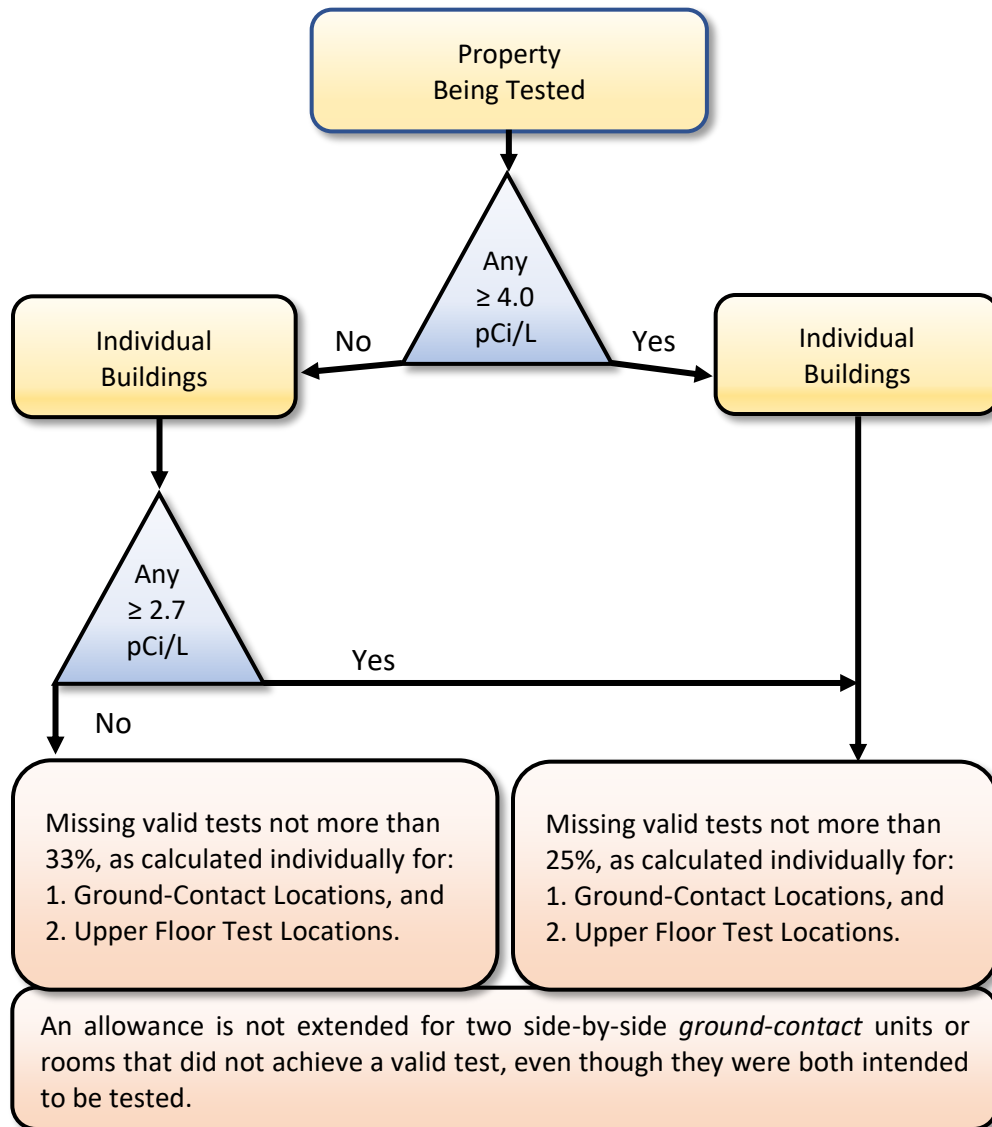
Table 6.2.2 ≥ 2.7 pCi/L (100 Bq/m³)

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

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.

Commentary/Rationale: Editorial flow-charts on the next page intend to help clarify the revised Section 6.2



Commentary/Rationale: Those assessing reports for having completed all steps are unaware if that did not actually occur when statements regarding such status are inadvertently left off the report.

8.2.4 Final Summary Reports

Where, in spite of insistent efforts, it is beyond the control of person(s) conducting the test to achieve valid tests in all locations required by this standard, the final *summary report*, and any elaborations in *summary report* attachments, shall provide a description of efforts for each location where conditions could not be overcome to achieve a valid test.

8.2.4 Final Summary Reports

Summary reports provided when all test procedures required by this standard are complete for the building(s) shall include a statement confirming that valid measurements were achieved at all required test locations unless missing valid tests exceed allowances in Section 6.2. Where exceeding those allowances, the summary report shall instead provide a description of efforts for locations where conditions could not be overcome to achieve the required number of valid tests.

Commentary/Rationale: The proposed replacement for Appendix C is in response to activities witnessed in the field relative to upper floor elevated concentrations now found in almost every region of the country. The revision attempts to establish clarity for the path of action intended.

NORMATIVE APPENDIX C

ELEVATED RADON CONCENTRATIONS IN UPPER FLOORS

C-1 Evaluation Procedures

Where elevated radon concentrations are found in upper floor test locations, an evaluation **shall** be conducted to determine the extent and cause of the elevated concentrations. A report that complies with all applicable portions of **Section 8 Test Reports** shall be provided relative to the results of each step of the evaluation. The report shall recommend that mitigation efforts are to comply with national standards.*(footnote: e.g., ANSI-AARST)

C.1.1 *Step 1—Soil gas and water*

C.1.1.1 Soil Gas

It shall be permitted to mitigate known or suspected sources of soil gas entry prior to initiating radon measurement evaluations of upper floors. When making this choice, post-mitigation testing shall include upper floor measurements in accordance with **Section C.1.2 Step 2**.

C.1.1.2 Water

It shall be permitted to conduct measurements, in accordance with national standards¹, and mitigation for radon in water prior to initiating radon measurement evaluations of indoor air on upper floors. Where *mitigation* included reducing *radon* in water supplies, post-mitigation testing **shall** include testing indoor air for *radon* in one or more locations within each dwelling or non-residential room where elevated *radon* concentrations had been found.

C.1.2 *Step 2—Measurement Evaluations*

Measurements shall be conducted to characterize elevated radon concentrations in upper floor areas of the building that include:

- a) a radon measurement in all dwellings and nonresidential rooms *intended for occupancy* on the floor closest to ground where elevated radon concentrations were found, and
- b) a radon measurement in all dwellings and non-residential rooms for no less than one additional upper floor, whether or not elevated radon concentrations were initially found there.

Exception: Where the cause and extent of elevated concentrations are confirmed to be radon in water.

C.1.3 *Step 3—Localized ventilation or building materials*

C.1.3.1 Step 3 A: Visual Evaluation

Where the measurements conducted in accordance with **Section C.1.2 Step 2** indicate inadequate ventilation or building materials specific to certain dwellings or non-residential rooms are the cause of elevated concentrations:

- a) A visual review shall be conducted for all other locations in the building where lack of ventilation or similar building materials could be the cause of elevated radon concentrations; and
- b) Confirmation that these conditions are the cause of elevated radon concentrations is not required. However, it shall be permitted to attempt confirmation by simultaneous radon measurements:
 1. in a room where poor ventilation or building materials are suspected as the cause, and
 2. in a nearby room suspected of having radon concentrations that are below the *action level*.

¹ ANSI/AARST MW-RN *Protocol for the Collection, Transfer and Measurement of Radon in Water*.

A report shall be provided with a summary of the visual review and any measurements conducted to include recommendations or guidance consistent with the findings of this characterization.

C.1.3.2 Step 3 B: Common To The Structure

Where evaluations indicate inadequate ventilation or building material sources are a cause of elevated concentrations common to the entire building or portions of the building, the measurement evaluation in [Section C.1.2](#) shall be repeated on one or more additional upper floors unless there is reliable evidence to support a different course of action. Where evaluations confirm concerns that the cause is common to the entire building or portion of the building, reports shall recommend *mitigation* for all floors or portions of the building identified with similar conditions.

C.1.3.3 Step 3 C: Clearance testing—Inadequate Ventilation Or Building Materials

Where elevated *radon* is identified to be caused by inadequate ventilation or building materials, *clearance testing* after attempts to mitigate resulting indoor radon concentrations shall be conducted for:

- a) All dwellings and non-residential rooms where efforts have been made to mitigate *radon* from inadequate ventilation or building materials; and
- b) All locations not tested but that demonstrate similar potential for causing elevated *radon* concentrations.

Where *mitigation* efforts include enhanced ventilation techniques, *post-mitigation clearance testing* shall include seasonal verification in accordance with [Section 7.3.2 b](#) within the first year of occupancy or ownership of property management.