Appendix

Ohio Radon Mitigation Standards

A. The Ohio radon mitigation standards (ORMS) include requirements for installation of radon remediation systems and provide a basis for evaluating the quality of such installations. It provides the basis against which in-progress or completed inspections will be evaluated. All documentation required by the ORMS shall be kept on file for ~~twenty~~ five years or the period of any warranty or guarantees, whichever is longer as an auditable record.

B. Radon mitigation specialists and radon mitigation contractors (the licensee) shall be responsible for all radon mitigation systems installed by their company or its subcontractors to ensure compliance with the requirements of this ORMS.

C. Limitations

1. Where discrepancies exist between provisions of the ORMS and municipal codes, the municipal codes shall take precedence, except that the municipal codes shall not take precedence with regard to alterations that may adversely impact the radon reduction functions for which such systems were originally designed and may adversely impact public health and safety regarding exposure to a radioactive element.

2. Compliance with the ORMS does not guarantee reduction of indoor radon concentrations to any specific level.

3. ~~When~~ Any altering of a mitigation system~~, it~~ shall ~~be upgraded to~~ meet the requirements of this appendix. ~~Altering radon mitigation systems does not include activities such as replacing worn out equipment or providing new filters, while leaving the remainder of the system unchanged. When maintenance is performed by a licensee on a mitigation system that does not comply with this chapter, the client shall be notified that the mitigation system does not comply with the mitigation standards of this chapter. Documentation of this activity shall be kept on file.~~

~~4. Mitigation systems in schools and commercial buildings should be designed and installed in conformance with appropriate technology as determined by the director.~~

D. Quality Assurance

Licensees shall follow the procedures specified in their quality assurance program as required by this rule.

Appendix

E. General Practices

The following general practices are required for all contacts between licensees and clients.

1. In the initial contact with a client, the licensee shall review any available results from previous radon measurements to assist in developing an appropriate mitigation strategy. If the radon measurement was not performed in accordance with this chapter, the client shall be advised in writing that a retest is recommended.

2. The licensee shall inform the client of or provide to the client, documents approved by the director, that discuss interpretation of indoor radon test results and the health risk associated with the radon level found in the building. These documents are available from the Ohio Department of Health web site at: http://www.odh.ohio.gov/odhprograms/rp/radlic/radlicg/radonlic1.aspx

3. The licensee shall inform the client in writing, at the time a proposal for the installation of a radon reduction system is offered, of any sealants, caulks, or bonding chemicals containing volatile solvents and of the need to ventilate work areas during and after the use of such materials. The licensee shall provide ventilation as recommended by the manufacturer of the material used if existing ventilation does not meet the recommendations of the manufacturer of the material used.

F. Building Investigation

1. The licensee shall conduct a thorough visual inspection of the building prior to ~~providing a written proposal and~~ initiating any radon mitigation work. The results of the inspection shall be recorded in detail on a drawing of the floor plan. The licensee shall identify and describe any specific building characteristics and configurations, such as, but not limited to: large cracks in slabs, exposed earth in crawlspaces, open stairways to basements, and operational conditions, such as continuously running heating ventilation and air conditioning (HVAC) systems or operation of windows, that may affect the design, installation, and effectiveness of radon mitigation systems.

   a. As part of this inspection, it is recommended that the licensee ~~should~~ request from the client any available information on the building, such as construction specifications, pictures, drawings, etc., that

might be valuable in determining the radon mitigation strategy.

b. A floor-plan drawing shall be finalized from preliminary inspection sketches and shall include illustration of the building foundation, the location of all walls, drain fixtures, HVAC systems and radon entry points, results of any diagnostic testing, the layout of any radon mitigation system piping, and the location of any vent fan and system warning devices.

c. The finalized drawing shall be an auditable part of the mitigation file and shall be available to the client and any future building owner upon request in accordance with subparagraph (H)(16)(B) of this appendix.

~~2. The licensee should conduct diagnostic tests to assist in identifying and verifying radon entry points and shall document the results of these tests in writing. Such tests may include radon grab sampling, continuous radon monitoring, the use of smoke sticks or a digital micromanometer.~~

3. If a licensee has concerns about backdrafting potential at a particular site, the licensee shall recommend that a qualified person inspect the natural draft combustion appliances and venting systems for compliance with local codes and regulations. The licensee shall recommend in writing that the building owner bring into compliance any combustion appliance or venting system found to be out of compliance.

4. The licensee shall not install a fan-powered radon reduction system in any building wherein confirmed spillage from any natural combustion appliance occurs, until the licensee has confirmed that the problem has been corrected by the client.

~~5. The licensee shall conduct a communication test prior to the installation of a radon reduction system in any building where the characteristics of the sub-slab material are unknown to the licensee. The results of the communication test shall be documented in writing or on a drawing of the building floor plan.~~

G. Systems Design

1. All radon mitigation systems shall be designed and installed as permanent, integral additions to a building.

2. All radon mitigation systems shall be designed to avoid the creation of other

health, safety, or environmental hazards to building occupants, such as backdrafting of natural draft combustion appliances.

3. The main run of vent pipe, from primary suction point to exhaust, shall be a minimum three inches in diameter to avoid excessive flow noise inside the pipe and noise when the exhaust is released.

4. All radon mitigation systems and their components shall be designed to comply with the laws, ordinances, codes, and regulations of relevant jurisdictional authorities, including applicable mechanical, electrical, building, plumbing, energy and fire prevention codes.

5. All radon mitigation systems shall be designed to reduce a radon concentration in each area within the footprint of the building as low as reasonably achievable (ALARA) and below the recommended action level of 4.0 pCi/l.

6. As installed, the mitigation system shall operate at a reasonable noise level.

7. The licensee shall conduct diagnostic tests when adding more than one suction point to any foundation type to assist in identifying and verifying radon entry points and shall document the results of these tests in writing. Such tests may include radon grab sampling, the use of smoke sticks or a digital micromanometer.

H. Systems Installation

1. General Requirements

a. All components of radon mitigation systems shall also be in compliance with the applicable mechanical, electrical, building, plumbing, energy and fire prevention codes, standards, and regulations of local jurisdiction.

b. Where portions of structural framing material must be removed to accommodate radon vent pipes, material removed shall be no greater than that permitted for plumbing installations by applicable building or plumbing codes.

c. Where radon mitigation system installation requires pipes or ducts to penetrate a firewall or other fire resistance rated wall, floor or ceiling penetrations shall be protected in accordance with applicable building, mechanical, fire and electrical codes.

~~d. Sump pits containing a sump pump should not be used as the primary suction point for mitigation systems.~~

2. Radon Vent Pipe Installation

a. All joints and connections in radon mitigation systems shall be permanently sealed with adhesives as specified by the manufacturer of the pipe material used, with two exceptions:

i. ~~If secondary s~~Suction points that are installed in sump pits, the system shall be designed with removable or flexible couplings to facilitate removal of the sump pit cover and for sump pump maintenance; and

ii. To facilitate maintenance and future replacement, radon vent fans shall be installed in the vent pipe using removable couplings or flexible connections that can be tightly secured to both the fan and the vent pipe.

b. Vent stack discharge points shall be directed vertically with no obstruction in the discharge. If a rodent screen is used, it shall be made of wire mesh no smaller than one-fourth inch. Rain caps shall not be installed on the discharge.

c. Radon vent pipes shall be fastened to the structure of the building with hangers, strapping, or other supports that will permanently secure the vent material. Fasteners designed and manufactured for this purpose shall be used. Existing plumbing pipes, ducts, or mechanical equipment shall not be used to support or secure a radon vent pipe. Drilling into radon ventilation pipe is prohibited except in the following cases:

i. Diagnostic test holes;

ii. Damper installations; and

iii. Installation of radon mitigation system monitors or a radon fan condensate bypass.

d. Radon vent pipes shall be supported as follows:

i. Interior vent pipes

a. Shall be fastened at a minimum of every eight feet on vertical runs;

b. Vertical runs shall be fastened within twelve inches of the points of penetration through floor, ceilings and roofs;

c. Shall be fastened at a minimum of every six feet on nonvertical runs; and

d. Nonvertical runs longer than ~~sixteen~~ twenty-four inches shall be fastened in at least one location.

ii. Exterior vent pipes

a. To ensure that fans are set as close to the building structure as possible, the distance from the centerline of the suction side vent pipe to the building ~~should~~ shall be no more than nine inches;

b. Shall be fastened within ~~sixteen~~ twenty-four inches of the upper rubber coupling to the fan;

c. Shall be fastened at a minimum of every eight feet on vertical runs;

d. Shall be fastened at a minimum of every six feet on nonvertical runs; and

e. Shall be fastened within three feet of the discharge point.

e. To prevent blockage of air flow into the bottom of radon vent pipes, these pipes shall be supported or secured in a permanent manner that prevents their downward movement to the bottom of suction pits or sump pits, or into the soil beneath an aggregate layer under a slab.

f. Radon vent pipes shall be installed in a configuration that ensures that any rain water or condensation within the pipes drains downward into the ground beneath the slab or soil gas retarder membrane.

g. Radon vent pipes shall not block access to any areas requiring

maintenance or inspection. Radon vents shall not be installed in front of or interfere with any light, opening, door, window or equipment access area required by code.

h. When a radon mitigation system is designed to draw soil gas from a perimeter drain tile loop (internal or external) that discharges water through a drain line to daylight or a soak-a-way, a one-way flow valve, water trap, or other control device shall be installed if diagnostic testing indicates that outside air is entering the system.

3. Vent Stack Discharge Point

The discharge from vent stack pipes of active soil depressurization systems shall prevent reentrainment of radon, prevent vent stack blockage due to heavy snowfall and prevent the direct exposure of individuals outside of buildings to high levels of radon by meeting all the following requirements:

a. Located above the highest eave of the roof and as close to the roof ridge line as possible;

b. Ten feet or more above ground level;

c. Ten feet or more above any yard, patio, deck, or occupiable space that is less than ten feet away from the discharge point. The ten feet may be measured either directly between the two points or be the sum of measurements made around intervening obstacles;

d. Ten feet or more from any window, door or other opening into conditioned spaces of the structure that is less than two feet below the exhaust point. The ten feet may be measured either directly between the two points or be the sum of measurements made around intervening obstacles;

e. Ten feet or more from any opening into an adjacent building;

f. For vent stack pipes that penetrate the roof, at least twelve inches above the surface of the roof; and

g. For vent stack pipes attached to or penetrating the sides of buildings, vertical and at least twelve inches above the edge of the highest roof where it is attached, and in a position to prevent blockage from snow or other materials and from being filled with water from the roof or an overflowing gutter.

4. Radon Vent Fan Installation

a. Radon vent fans used in active soil depressurization systems shall be installed in attics, in garages that are not beneath conditioned spaces, or on the exterior of the building. Radon vent fans shall not be installed below ground; in the conditioned (heated/cooled) space of a building; in window wells; or in any basement, crawlspace, or other interior location directly beneath the conditioned spaces of a building.

b. Radon vent fans shall be installed in a configuration that avoids condensation buildup in the fan housing. Fans shall be installed in vertical runs of the vent pipe.

c. Radon vent fans shall be mounted and secured in a manner that minimizes transfer of vibration to the structural framing of the building.

d. Radon vent fans shall be mounted to the vent pipe with removable couplings or flexible connections to facilitate fan removal for repair or replacement.

e. The intakes of fans used in crawlspace pressurization, or in pressurizing the building itself, shall be screened or filtered to prevent ingestion of debris or personal injury. Screens or filters shall be removable to permit cleaning or replacement and the building occupant and owner shall be informed in writing of the need to periodically replace or clean such screens and filters. This information shall be included in documentation provided to the client and is an auditable part of the mitigation record.

f. Vent fans shall originate from a manufacturer that lists radon mitigation as one of the fan's intended uses.

5. Suction Pit Requirement for Subslab Depressurization (SSD) Systems

a. Materials shall be excavated from the area immediately below the slab penetration point of SSD system vent pipe.

~~b. The area below the slab shall provide optimum pressure field extension.~~

6. Sump Pit Requirements

~~a. Sump pits containing a sump pump should not be used as the primary suction point for mitigation systems.~~

b. Sump pits that permit entry of soil gas or that would allow conditioned air to be drawn into a mitigation system shall be covered and sealed air tight to prevent such entry.

c. When a sump pit, which is the only system in the basement for protection from or relief of excess surface water, is covered for radon control purposes, an alternative floor level drainage system shall be provided. This alternative system may be a new trapped floor drain leading to the sump or a trapped drain installed in the sump pit cover.

d. Sump pit covers shall incorporate a view-port to permit observations of conditions in the sump pit.

e. Sump pit covers shall be made of durable plastic, clear polycarbonate or other rot-proof rigid material and be designed to permit air-tight sealing.

f. Sump pit covers shall be designed to support the weight of a one hundred fifty-five pound individual standing on the cover.

g. To permit easy removal of the sump pit cover for sump pump servicing, the sump pit cover shall be sealed using silicone or other nonpermanent caulking materials.

7. Sealing Requirements

a. Openings around radon vent pipe penetrations of the slab, the foundation walls, or the crawlspace soil gas retarder membrane shall be cleaned, prepared and sealed in a permanent, air-tight manner with a mechanical fastener and using compatible caulks or other compatible sealants.

b. Openings around other utility penetrations of the slab, walls or soil gas retarder shall also be sealed. Cracks in slabs and other small openings around penetrations of the slab and foundation walls shall be cleaned, prepared and sealed in a permanent air-tight manner using caulks or other sealants designed for such application.

c. Where a Block Wall Depressurization (BWD) system is used to mitigate radon, openings in the tops of the block walls and all accessible openings or cracks in the interior surfaces of the block walls shall be cleaned, prepared and sealed with caulks or other sealants designed for such application.

d. When sealing holes for plumbing rough-in or other large openings in slabs and foundation walls that are below the ground surface, nonshrink mortar, grouts, expanding foam, or other sealants designed for such application shall be used. Additionally, flat lids may be used for sealing of holes greater than 10 inches that were created by persons other than the radon mitigation contractor.

e. Openings or cracks that are determined to be inaccessible or beyond the ability of the licensee to seal shall be disclosed to the client in writing and included in the system documentation ~~which is an auditable part of the mitigation record~~.

f. Openings, perimeter channel drains or cracks that exist where the slab meets the foundation wall (floor-wall joint), shall be sealed with urethane caulk or other sealants designed for such application. When the opening or channel is greater than 0.5 inch in width, a foam backer rod shall be inserted in the channel before application of the sealant. This sealing technique shall be done in a manner that retains the channel feature as a water control system. Other openings or cracks in slabs or at expansion or control joints shall also be sealed.

g. When installing baseboard type suction systems, all seams and joints in the baseboard material shall be joined and sealed using materials recommended by the manufacturer of the baseboard system. Baseboards shall be secured to walls and floors with adhesives designed and recommended for such installations. If a baseboard system is installed on a block wall foundation, the tops of the block walls shall be closed and sealed.

8. Soil Gas Retarder Requirements

a. A soil gas retarder membrane shall be installed in basement or crawlspace areas without a concrete floor.

b. Plastic sheeting installed in crawlspaces or basements as soil gas

retarder shall be a minimum of six mil polyethylene or equivalent flexible material (e.g. three mil cross-laminated polyethylene). Heavier gauge sheeting ~~should be used~~ is recommended when crawlspaces are used for storage, or frequent entry is required for maintenance of utilities.

c. Any seams in soil gas retarder membranes shall be overlapped at least twelve inches and sealed in a permanent air-tight manner using compatible glues. The membrane shall also be sealed around interior piers and to all the ~~inside of exterior~~ interior walls of the crawlspace with a continuous band of furring strips or a combination ~~another type~~ of permanent mechanical fastener and sealant or in accordance with specific procedures approved by the director. The membrane shall not be installed on the band board. The membrane must be at least 3 inches below the band board in the crawlspace. When using a mechanical fastener, you shall install one within 3 inches of any outside corner or inside corner on each crawlspace wall and sufficient number to maintain sheeting placement on long runs (maximum spacing 16 inches apart) to securely fasten the membrane to the walls of the crawlspace.

d. Access doors required by local building codes shall be fitted with air-tight gaskets and a means of positive closure, but shall not be permanently sealed. In cases where both the basement and the adjacent crawlspace areas are being mitigated with active SSD and SMD systems, sealing of the openings between those areas is not required.

e. Crawlspace depressurization without the use of a soil gas retarder membrane shall only be used when the crawlspace is inaccessible. An inaccessible crawlspace is one where a rescuer in full gear with an airpack cannot reach a trapped individual within the crawlspace without structural destruction to the building. When crawlspace depressurization is used for radon mitigation, openings and cracks in floors above the crawlspace that would permit conditioned air to pass out of the living spaces of the building, shall be identified, closed and sealed. Sealing of openings around hydronic heat or steam pipe penetrations shall be done using noncombustible materials.

9. Electrical Requirements

a. All mitigation system electrical components shall be UL listed or of

equivalent specifications.

b. All mitigation systems shall conform to provisions of the "National Electrical Code" and any additional local regulations.

c. Wiring shall not be located in or chased through the radon vent piping or any heating or cooling ductwork.

d. Any plugged cord used to supply power to a radon vent fan shall be no longer than six feet in length.

e. No plugged cord shall penetrate a wall or be concealed within a wall.

f. Radon mitigation fans installed on the exterior of buildings shall be hard-wired into an electrical circuit. Electrical disconnects shall be installed outside, within line of sight of the fan and within four feet of the fan.

g. If the rated electricity requirement of a radon mitigation system fan exceeds fifty per cent of the circuit capacity into which it will be connected, or if the total connected load on the circuit (including the radon vent fan) exceeds eighty per cent of the circuit's rated capacity, a separate, dedicated circuit shall be installed to power the fan.

h. An electrical disconnect switch or circuit breaker shall be installed in radon mitigation system fan circuits to permit deactivation of the fan for maintenance or repair. Disconnect switches are not required with plugged fans.

10. Drain Installation Requirements

a. If drains discharge directly into soil beneath the slab or through solid pipe to a soak-a-way, the licensee shall install an airtight drain that meets local building codes and maintains the water drainage properties of the drain.

b. If condensate drains from air conditioning units terminate beneath the floor slab, the licensee shall install a trap in the drain that provides a minimum six-inch standing water seal depth, reroute the drain directly into a trapped floor drain, or reconnect the drain to a condensate pump.

~~c. Perimeter (channel or French) drains shall be sealed with backer rods and urethane or other comparable and compatible sealants in a manner that will retain the channel feature as a water control system.~~

d. When a sump pit is the only system in a basement for protection or relief from excess surface water and a cover is installed on the sump for radon control, the cover shall be recessed and fitted with a trapped drain meeting the requirements of paragraph (H)(6) of this appendix.

11. HVAC Installation Requirements

~~a. Modifications to an existing HVAC system that are proposed to mitigate elevated levels of radon should be reviewed and approved by the original designer of the installed HVAC system or by a licensed mechanical contractor.~~

~~b. Foundation vents, installed specifically to reduce indoor radon levels by increasing the natural ventilation of a crawlspace, shall be noncloseable. In areas subject to subfreezing conditions, the existing location of water supply and distribution pipes in the crawlspace, and the need to insulate or apply heat tape to those pipes, shall be considered when selecting locations for installing foundation vents.~~

c. Heat Recovery Ventilation (HRV) systems shall not be installed in rooms that contain friable asbestos.

d. In HRV installations, supply and exhaust ports in the interior shall be located a minimum of twelve feet apart. The exterior supply and exhaust ports shall be positioned to avoid blockage by snow or leaves and be a minimum of ten feet apart.

~~e. Contractors installing HRV systems shall verify that the incoming and outgoing airflow is balanced to ensure that the system does not create a negative pressure within the building. Contractors shall inform their client, the occupant and the owner that periodic filter replacement and inlet grill cleaning are necessary to maintain a balanced airflow. Information on filter replacement and inlet grill cleaning shall be provided to their client, the occupant and the owner and shall be included in the documentation.~~

f. Both internal and external intake and exhaust vents in HRV systems

shall be covered with wire mesh or screening to prevent entry of animals or debris or injury to occupants.

12. Materials

a. As a minimum, all plastic vent pipes in mitigation systems shall be smooth-walled “Schedule 40” polyvinyl chloride (PVC), foam core, or acrylonitrile butadiene styrene (ABS) pipe.

b. Vent pipe fittings in a mitigation system shall be of the same material as the vent pipes except as noted in paragraph (H)(2)(a) of this appendix.

c. Cleaning solvents and adhesives used to join plastic pipes and fittings shall be as recommended by manufacturers for use with the type of pipe material used in the mitigation system.

d. When sealing holes for plumbing rough-in or other large openings in slabs and foundation walls that are below the ground surface, nonshrink mortar, grouts, expanding foam or other sealants designed for such application shall be used.

e. Penetrations of sump covers to accommodate electrical wiring, water ejection pipes, or radon vent pipes shall be designed to permit air-tight sealing around penetrations, using silicone caulk or grommets.

f. Plastic sheeting installed in crawlspaces as soil gas retarders shall be a minimum of six mil polyethylene or equivalent flexible material (e.g. three mil cross-laminated polyethylene). Heavier gauge sheeting shall be used when crawlspaces are used for storage, or frequent entry is required for maintenance of utilities.

g. Any wood that comes into direct contact with the soil or concrete and is used in attaching soil gas retarder membranes to crawlspace walls or piers shall be pressure treated ~~or naturally resistant to decay and termites~~.

13. Monitors and Labeling

a. All active soil depressurization systems shall include a mitigation system monitor to indicate fan operation system performance or warn of fan failure.

b. If an electrical radon mitigation system monitor~~s~~ (whether visual or audible) is installed, then it shall be installed on nonswitched circuits and be designed to reset automatically when power is restored after service or power supply failure. Battery operated monitoring devices shall not be used unless they are equipped with a low-power warning feature.

c. Mechanical radon mitigation system monitors, such as manometer type pressure gauges, shall be clearly marked to indicate the pressure readings that existed when the system was initially activated. Written documentation of system pressure shall be given to the client and kept as part of the auditable mitigation record.

d. All exposed and visible interior radon mitigation system vent pipe shall be identified with at least one label on each floor level that reads "RADON REDUCTION SYSTEM,"

e. All ~~F~~fans ~~mounted outdoors and exterior vent pipe~~ shall be identified with a label that reads "RADON REDUCTION SYSTEM" in a permanent and weatherproof manner.

f. Sump pits that are depressurized by the mitigation system or covered to minimize radon entry shall be identified with a label that reads:

"RADON REDUCTION SYSTEM – REMOVAL OF THIS COVER MAY RESULT IN FAILURE OF THE RADON REDUCTION SYSTEM. CONSULT (installer's name and phone number) BEFORE REMOVING THIS COVER AND FOR INSTRUCTIONS ON THE CORRECT PROCEDURE FOR REPLACING IT."

g. Circuit breakers controlling the circuits on which the radon vent fan and system failure warning devices operate shall be labeled "RADON REDUCTION SYSTEM or RADON FAN CIRCUIT."

14. Postinstallation Checklist

a. Upon completion of the installation of any radon mitigation system, the ~~licensee~~ mitigation specialist who installed the system shall complete the following steps, and document them on an installation check sheet that shall be signed and dated by said licensee and shall

become part of the auditable mitigation record.

i. Verify the integrity of the fan mounting seals and all joints in the interior vent piping.

ii. Verify system pressure to assure that the system is operating as designed.

iii. Immediately after installation and activation of any active (fan-powered) depressurization system in buildings containing natural draft combustion appliances, ~~the building shall be tested for backdrafting of those appliances~~ if back drafting is suspected or observed ~~Any backdrafting condition that results from~~ the installation of the radon mitigation system shall be corrected before the system is placed in operation. A record of the results of the backdrafting test or the reasons why the test was not conducted shall be included in the auditable mitigation record.

iv. Advise the client that retesting the building at least every two years or if the building undergoes significant alteration is recommended.

v. Request a copy of the postmitigation test report conducted by an independent licensed radon tester if the postmitigation test was not conducted by the licensed radon mitigation specialist who installed the radon mitigation system.

vi. Verify sump pump is connected to an electric source.

b. Radon mitigation licensees shall inform the client in writing that postmitigation testing ~~should~~ shall be conducted no sooner than twenty-four hours, nor later than thirty days following completion and activation of the mitigation system. The client shall also be informed the test shall be conducted by the licensed radon mitigation specialist who installed the radon mitigation system or an independent licensed radon tester or independent licensed radon mitigation specialist. This documentation is part of the auditable mitigation record.

15. Postmitigation Testing

a. Evaluate the effectiveness of the mitigation system using an

approved radon measurement device.

b. Postmitigation tests shall be performed in accordance with the applicable requirements of rule 3701-69-07 of the Administrative Code.

16. Contracts and Documentation

a. No mitigation activity shall be undertaken before a proposal for the work is accepted by the client, as evidenced by the client's signature and date on the proposal. A proposal for the installation of any radon mitigation system is auditable by the director and shall include as a minimum:

i. The Ohio license numbers of the licensed radon mitigation specialist(s) and contractor(s);

ii. A statement describing the planned scope of the work and an estimated completion date;

iii. A statement describing any known hazards associated with chemicals used in or as part of the installation;

iv. A statement indicating compliance with and implementation of the Ohio radon mitigation standards described in this appendix;

v. A description of any system maintenance that the client, the occupant, or the building owner would be required to perform;

vi. ~~A~~ An estimate of both the price of the installation cost and ~~an estimate of~~ the annual operating costs of the system;

vii. A statement that the system is guaranteed to reduce the average radon concentration to less than four picocuries per liter (pCi/L) ~~and the conditions thereof;~~ or a statement explaining that there is no guarantee and the reasons why there is no guarantee; and

viii. A copy of the signed contract stating whether or not the licensee was involved in the testing or initial advice that lead to radon mitigation and the benefits of long-term testing as required in paragraph (B) of rule 3701-69-07, paragraph (B)

of rule 3701-69-08, and paragraph (C) of rule 3701-69-09 of the Administrative Code.

b. Licensees shall maintain the following records for five years or for the period of any warranty or guarantees, whichever is longer. The licensee shall, upon completion of the mitigation project, provide clients with an information package that includes all items in this paragraph. The licensee shall also make the following records available to the current homeowner upon request:

i. Copies of the building investigation summary and floor-plan sketch;

ii. The finalized drawing that includes illustration of the building foundation, the location of all walls, drain fixtures, HVAC systems and radon entry points, results of any diagnostic testing, the layout of any radon mitigation system piping, and the location of any vent fan and system warning devices;

iii. Pre- and postmitigation radon test data;

iv. Copies of contracts and warranties;

v. A description of the mitigation system installed and its basic operating principles;

vi. A description of any deviations from the ORMS and applicable regulations of this section;

vii. A description of the proper operating procedures of any mechanical or electrical systems installed, including manufacturer's operation and maintenance instructions and warranties;

viii. The proposal, contract, and warranties or guarantees made to the client, and any other documentation important to the mitigation system installed;

ix. The address of the building mitigated, including the zip code, the mitigation system type, the mitigation date, and all other information requested in rule 3701-69-13 of the Administrative Code;

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x. A list of appropriate actions for clients to take if the system failure warning device indicates system degradation or failure;

xi. The name, telephone number, and license number of the ~~licensee~~ licensed radon mitigation contractor and the phone number of the "Ohio Department of Health's Radon Program";

xii. The name and license number of the licensed radon mitigation specialist providing on-site supervision at the project site; and

xiii. The names and license numbers of licensed radon testers and radon mitigation specialists involved in the project.