

**Office of the State Fire Marshal - Engineering Division**  
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**Polyethylene ground vapor retarder permitted as wall liner**

**Code:** 2018 North Carolina Residential Code

**Date:** April 16, 2026

**Section:** R409.2.2, N1102.2.11

**Question:**

Does R409.2.2 require the ground vapor retarder to be pulled up to cover the entire surface of the walls in a closed crawl space?

**Answer:**

It is allowed, but not required.

The section which causes some confusion is located in R409.2.2, and it is shown below in context of the overall code section in which it resides.

**R409.2<sup>1</sup> Groundwater vapor retarder. ...**

**R409.2.1 Ground vapor retarder. ...**

**R409.2.2 Liner.** The ground vapor retarder is permitted to be installed as a full interior liner by sealing the edges to the walls and beam columns and sealing the seams. Single piece liner systems are approved. The top edge of the wall liner shall terminate 3 inches (76 mm) below the top edge of the masonry foundation wall. ...

**R409.2.2.1 Wall liner termite inspection gap. ...**

The first sentence in R409.2.2 Liner reads:

**R409.2.2 Liner.** The ground vapor retarder **is permitted** to be installed as a full interior liner by sealing the edges to the walls and beam columns and sealing the seams.

The third sentence reads:

The top edge of the liner **shall** terminate 3 inches (76 mm) below the top edge of the masonry foundation wall.

The first sentence is allowing the ground vapor retarder to be used on the walls, as it can control moisture drive through the walls into the space also, but is **not** requiring it. **Remember, the ground vapor retarder is not the only means of providing air and moisture control through the walls; it could also be controlled with liquid-applied CMU block sealants, some spray foams, rigid foam boards, etc.** However, if and only if it is used on the walls, the third sentence is requiring that it shall stop 3-inches below the top edge of the masonry, so to act as a termite inspection gap, in accordance with **R409.2.2.1 Wall liner termite inspection gap**.

The confusion tends to occur if people skip the first sentence in R409.2.2 and jump directly to the third sentence. It certainly could be worded better, but this web interpretation is clarifying the NC-specific code language as written and intended.

### **Follow up Question #1**

Does R409.2.2 require the ground vapor retarder to be sealed to the walls and beam columns, and if yes, how high?

#### **Answer:**

Yes, the ground vapor retarder is required to be sealed to the walls **and** beam columns. The height of attachment on the walls can be no higher than 3-inches below the top edge of the masonry foundation wall, but no minimum is specified. The permit holder is responsible for attaching it at a height that will achieve the code goals.

However, the attachment to the columns is specified, and that height is a minimum of 4-inches.

### **Follow up question #2**

Is the ground vapor retarder subject to the same bottom termite inspection gap requirement as foam plastic insulation, as described in R318.4.1 or N1102.2.11?

#### **Answer:**

No.

Section R318.4.1 refers to Appendix O, and this appendix is addressing foam plastic mounted on the exterior of the foundation or foundation walls, and does not address the liner at all. Section N1102.2.11 refers to Appendix E-2.2, and there are illustrations of required inspection and treatment gaps at the bottom of the foam plastic, but there is no limitation or requirement imposed on a polyethylene liner on the wall. In other words, the liner is not required to be slit at the ground/wall interface by the code language.

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<sup>i</sup> **R409.2 Groundwater vapor retarder.** Closed crawl spaces shall be protected from water entry by the evaporation of water from the ground surface.

**R409.2.1 Ground vapor retarder.** A minimum 6-mil (0.15 mm) polyethylene vapor retarder or equivalent shall be installed to nominally cover all exposed earth in the crawl space, with joints lapped not less than 12 inches (305 mm). Minor pockets or wrinkles that prevent total drainage across the surface of the vapor retarder are allowed. The floor of the crawl space shall be graded so that it drains to one or more low spots. Install a drain to daylight or sump pump at each low spot. Crawl space drains shall be kept separate from roof gutter drain systems and foundation perimeter drains.

**R409.2.2 Liner.** The ground vapor retarder is permitted to be installed as a full interior liner by sealing the edges to the walls and beam columns and sealing the seams. Single piece liner systems are approved. The top edge of the wall liner shall terminate 3 inches (76 mm) below the top edge of the masonry foundation wall. The top edge of the liner shall be brought up the interior columns a minimum of 4 inches (102 mm) above the crawl space floor. The floor of the crawl space shall be graded so that it drains to one or more low spots. Install a drain to daylight or sump pump at each low spot. Crawl space drains shall be separate from roof gutter drain systems and foundation perimeter drains.

**R409.2.2.1 Wall liner termite inspection gap.** Provide a clear and unobstructed 3 inch (76 mm) minimum, 4 inch (102 mm) maximum inspection gap between the top of the wall liner and the bottom of the wood sill. This inspection gap may be ignored with regards to energy performance and is not intended to create an energy penalty.