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R313 - Carbon Monoxide Alarms in One-and-Two-Family Dwellings and Townhouses

Code: 2009 NC Residential Code **Date:** April 1, 2011

Section: R313

The North Carolina Building Code Council approved an amendment to the 2009 NC Residential Code that revises Section R313 to require the installation of carbon monoxide alarms in new and existing one-and-two-family dwellings and townhouses. The amendment has an effective date of January 1, 2011 and reads as follows:

R313.1.1 Carbon monoxide alarms. *In new construction, dwelling units shall be provided with an approved carbon monoxide alarm installed outside of each separate sleeping area in the immediate vicinity of the bedroom(s) as directed by the alarm manufacturer.*

R313.1.2 Where required-existing dwellings. *In existing dwellings, where interior alterations, repairs, fuel-fired appliance replacements, or additions requiring a permit occurs, or where one or more sleeping rooms are added or created, carbon monoxide alarms shall be provided in accordance with Section 313.1.1.*

R313.1.3 Alarm requirements. *The required carbon monoxide alarms shall be audible in all bedrooms over background noise levels with all intervening doors closed. Single station carbon monoxide alarms shall be listed as complying with UL 2034 and shall be installed in accordance with this code and the manufacturer's installation instructions.*

Implementation and enforcement of the above code section has generated a number of questions. Included below is a list of the most significant questions and the DOI, Engineering Division's response:

Question 1:

What work and/or permit issuance triggers the installation of carbon monoxide alarms in an existing residence?

Answer:

Compliance with R313.1.2 is triggered by any of the following:

1. The issuance of a permit, requiring compliance with the NC Residential Code, for interior alterations or repairs, or
2. The issuance of a permit, requiring compliance with the NC Residential Code, for a building addition, or
3. The issuance of any permit (building or trades) for the installation and/or replacement of a fuel-fired appliance, or
4. The addition or creation of one or more sleeping rooms

Question 2:

Relative to the addition or creation of one or more sleeping rooms:

1. Does this mean that if a homeowner converts an existing room from a study or some other use into a bedroom, which does not require a building permit, that the installation of a carbon monoxide detector is required?

Answer: Technically all work must comply with the requirements of the codes and the installation of the alarms would be required. However, since a permit was not issued, there is no way that the local inspections department can verify compliance.

2. Does this mean that if a homeowner finishes off a previously unfinished space in the homeowner's dwelling for a bedroom, doing the work himself without getting a permit (the HVAC and electrical may have been installed earlier), that the installation of a carbon monoxide detector is required?

Answer: Technically all work must comply with the requirements of the codes and the installation of the alarms would be required. However, since a permit was not issued, there is no way that the local inspections department can verify compliance.

Question 3:

As an inspections department, we just recently became aware of the code amendment. Must compliance be required for all permits issued since the beginning of the year or can we draw a line in the sand and begin enforcement as of this date?

Answer:

The amendment requirements should be enforced for all applicable projects with permits that are currently open and issued on or after January 1, 2011.

Question 4:

Is there a special permit for this device or is it lumped with any permit that would trigger the installation as stipulated in R313.1.2?

Answer:

There are no requirements to issue a special permit for compliance with the code amendment. Each jurisdiction should decide individually how to best handle enforcement. The DOI feels that most of the devices will be either plug-in or battery-powered units, for retrofits, that could be inspected without a separate permit. If it is a hard-wired device, then an electrical permit is appropriate.

Question 5:

When the permit is issued for the installation of appliances, equipment, fixtures or devices covered by the trade codes (such as the renovation of a bathroom that encompasses only plumbing fixtures with no building related issues, or the change out of an electrical panel) would the requirements of R313.1.2 apply?

Answer:

If there are no building related issues and a building permit (requiring compliance with the NCRC) is not issued, and no fuel-fired appliance is being installed or replaced, the requirement for carbon monoxide alarms is not triggered. How the local jurisdiction chooses to enforce this (compliance verification by certified building inspector or certified trades inspector) is strictly up to the jurisdiction.

Question 6:

Since this is an amendment in the NC Residential Code, can a mechanical or plumbing inspector do the inspection on the carbon monoxide installation or does it require a certified building inspector?

Answer:

For either plug-in or battery-powered units there is little in the Code to inspect other than the location “in the vicinity of the bedrooms” and compliance with UL 2034. The manufacturer’s instructions will be onsite with the device. The mechanical or plumbing inspector should be able to inspect those items, but that is the local jurisdiction’s decision as referenced in answer 5 above. If it is a hard-wired device, then an electrical permit is appropriate.

Question 7:

Do the requirements for carbon monoxide alarms include homes without any fuel-fired appliances or an attached garage?

Answer:

Yes. The code requirements are not predicated upon a home having a fuel-fired appliance or an attached garage.

Question 8:

If I am an electrical contractor installing an electric fence in the yard of an existing dwelling, would I be required to install carbon monoxide alarms in the dwelling?

Answer:

No. In this case, there are no building related issues and a building permit (requiring compliance with the NCRC) is not being issued; therefore, the requirement for carbon monoxide alarms is not triggered.

Question 9:

I have an inspection for the replacement of an electric water heater (the permit was requested by the plumber for his protection) and per the new GS this replacement does not require the issuance of a permit. Would this installation evoke the requirement for carbon monoxide alarms given that it is not “required by the Residential Code?”

Answer:

No. If there are no building related issues and a building permit (requiring compliance with the NCRC) is not issued and a fuel-fired appliance is not being installed, the requirement for carbon monoxide protection is not triggered.

Question 10:

For existing dwellings, would it be safe to say the carbon monoxide alarm requirements will be triggered for permits issued for Residential Building Code standards (as regulated by the NC Residential Code) and for trade permits issued for the installation/replacement of fuel-fired appliances and all other permits, that may be issued, would not require the installation of these alarms?

Answer:

See the answer to Question 1 above.

Question 11:

Are the carbon monoxide alarms required to be hard-wired units?

Answer:

The new carbon monoxide alarm requirements (NC Residential Code, Section R313) do not include any language that requires the use of hard-wired devices. It is the position of this office that the code text allows the use of alarms that are hard wired, battery operated, or plug-in. The detectors must be labeled as compliant with the requirements of UL 2034 and must be installed in accordance with the device manufacturer’s installation instructions.

Question 12:

Is a carbon monoxide alarm required for fuel-fired appliances installed outdoors?

Answer:

Fuel-fired appliances located on the exterior of a dwelling structure shall be installed in accordance with its listing and the manufacturer’s installation instructions and does not trigger compliance with the carbon monoxide alarm requirements of the NC Residential Code, Section R313.1.2. The exception to this is the exterior installation fuel-fired hot air furnaces which could conceivably introduce carbon monoxide to the dwelling interior through connected ducts.

NOTE: Additional code amendments, to address and clarify the above, are being prepared for presentation to and consideration by the Building Code Council.

Keywords:

carbon, monoxide, alarms, detectors, fuel-fired