



Smoke Alarms and Heat Detectors in Residential Structures

This issue of the Code Outreach Program will give a brief overview of the requirements for smoke alarms, heat detectors, and smoke alarm interconnection in new and existing structures regulated by the 2020 Residential Code of New York State (RCNYS). Section 202 of the 2020 Fire Code of New York State (FCNYS) defines smoke alarms as “a single- or multiple-station alarm responsive to smoke.” Smoke alarms are devices which typically include both a smoke detector and an audible (and/or visible) alarm in one unit. Requirements for carbon monoxide detectors are not addressed in this issue. In many existing residential structures, existing smoke alarms are not interconnected, meaning the activation of any individual alarm does **not** activate other alarms within the structure. However, Section R314.4 of the 2020 RCNYS requires smoke alarms to be interconnected in all new construction that includes dwelling units, and Appendix J of the 2020 RCNYS requires interconnection between smoke alarms in some existing buildings undergoing modifications. All section numbers included below reference the 2020 RCNYS unless otherwise noted.

Required Locations

Per Section R314.3, smoke alarms are required:

- “In each sleeping room.”
- “Outside each separate sleeping area in the immediate vicinity of the bedrooms.”
- “On each additional story of the dwelling, including basements and habitable attics and not including crawl spaces and uninhabitable attics.”

Smoke alarms shall be installed as follows (all distances shall be measured horizontally), unless these constraints would prevent the installation of an alarm in any of the required locations listed above:

- Smoke alarms - not less than 3 feet from the door or opening of a bathroom that contains a bathtub or shower.
- Ionization smoke alarms - not less than 20 feet from a permanently installed cooking appliance.
- Ionization smoke alarms with an alarm-silencing switch - not less than 10 feet from a permanently installed cooking appliance.
- Photoelectric smoke alarms - not less than 6 feet from a permanently installed cooking appliance.

Per Sections R314.2.3 and R314.4.1, heat detectors “shall be installed in new garages that are attached to or located within new and existing dwellings” and “shall be connected to an alarm or smoke alarm that is installed in the dwelling unit.” Heat detectors are not required in existing garages, except where such existing garages are required by the Uniform Code to meet the requirements for new construction.

Interconnection in New Construction

For new construction, smoke alarms “shall be interconnected in such a manner that the actuation of one alarm will activate all of the alarms in the individual dwelling unit” per Section R314.4. Smoke alarms can be interconnected physically (wired together) or by listed wireless devices designed for this purpose. Smoke alarms within two-family dwellings and townhouses do not need to be interconnected between adjacent dwellings—only within the individual dwelling unit.

Interconnection in Existing Buildings

Per Sections AJ401.8, AJ501.6, and AJ601.8, repairs and alterations “shall be done in a manner that maintains the level of fire protection provided.” Existing interconnected smoke alarms cannot be replaced by non-connected smoke alarms even if, absent the existing interconnected smoke alarms, the 2020 RCNYS would otherwise permit an existing dwelling unit of this type to have non-connected smoke alarms. Except in bed-and-breakfast dwellings, for additions or alterations to existing buildings, smoke alarms within the new construction area(s) are not required to be interconnected to existing smoke alarms outside the new construction area(s) which are either not currently interconnected or are unable to be interconnected with the new smoke alarm devices.

All modifications to existing structures require smoke alarms to be located “as required for new dwellings” for any construction which involves modifications to the interior of the structure (per AJ401.8.1, AJ501.6.1, and AJ601.8.1). Except for bed-and-breakfast dwellings, interconnection of the smoke alarms is not required “where existing interior wall or ceiling finishes are not removed to expose the structure.”

Power Source Requirements

In new construction, smoke alarms and heat detectors are required to receive primary power from building wiring and have battery backup, with a few exceptions (R314.6). In existing buildings undergoing repairs or either level of alteration, smoke alarms which operate solely from battery power are permitted to be installed “where existing interior wall or ceiling finishes are not removed to expose the structure” (AJ401.8.2, AJ501.6.1.1, and AJ601.8.1.1). Battery-powered smoke alarms are not required to be interconnected.

Maintenance Requirements

Per Section 907.10 of the 2020 FCNYS: “Smoke alarms shall be tested and maintained in accordance with the manufacturer’s instructions. Smoke alarms shall be replaced when they fail to respond to operability tests, or when they exceed 10 years from the date of manufacture, unless an earlier replacement is specified in the manufacturer’s published instructions.”