
City of Burlington

Hardwired Smoke Detector Installation Guidelines

This booklet should be used as a guide only. All smoke detector placements must be approved by Burlington's Life Safety Code & Building Inspector.

SMOKE DETECTOR LIMITATIONS

According to the Federal Emergency Management Agency, smoke detectors may not go off or provide adequate warning time in as many as 35% of all fires.

Smoke detectors will not work without power.

Battery operated smoke detectors will not work if there is no power because:

- ◆ the batteries are dead
- ◆ the wrong batteries are installed
- ◆ the batteries are incorrectly installed
- ◆ the batteries have been removed to silence a 'nuisance' alarm

Hardwired (AC) detectors will not work if there is no power because:

- ◆ there is Power company failure (either at a generator or along the power lines)
- ◆ there is an open fuse or circuit breaker in the home
- ◆ a fire in the home has burned wiring before the alarm has sounded

AC Powered Smoke Detectors with Battery Backup are the Safest Alternative

Smoke detectors may not be heard.

All UL listed smoke detectors meet current standards for loudness. However, they may not be heard by occupants in a home when:

- ◆ the detector is located outside the closed bedroom door of a sound sleeper
- ◆ the detector is located outside the closed bedroom door of a sleeper who recently used drugs or has been drinking alcoholic beverages
- ◆ the detectors is located on a different level than bedrooms
- ◆ the occupant is hard of hearing
- ◆ the sound is blocked by distance, closed doors, or ambient noise such as:
 - traffic
 - televisions and stereos
 - air conditioners
 - other appliances and equipment

Smoke Detectors Shall Be Placed Within Every Room Used For Sleeping, Outside Of Sleeping Area, And On Every Level Of Each Dwelling Unit, Including Basements

Smoke detectors will not work when the smoke does not reach the detector.

- ◆ Fires may not trigger an alarm when:
 - A fire starts in a chimney, roof or within a wall
 - The fire starts on the other side of a closed door
 - A detector on the 2nd floor may not sense a fire in the first floor or Basement.

***Smoke Detectors Shall Be Interconnected:
A Fire in the Basement Should Alarm in the Bedroom***

BURLINGTON'S SMOKE DETECTOR ORDINANCE

City of Burlington Code of Ordinances

Chapter 18: Housing

Section 18-99. Smoke Detectors

(a) Each and every dwelling, rooming house, dwelling unit or rooming unit let to another for occupancy shall meet the following requirements for smoke detectors/ alarms.

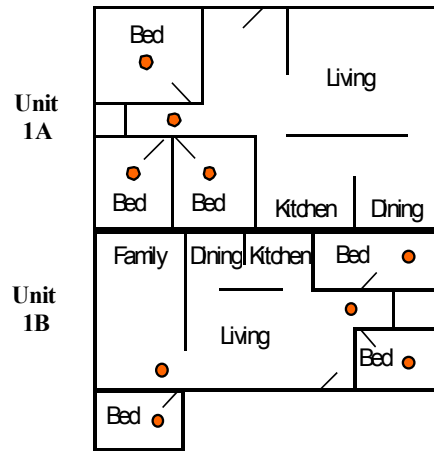
- (1) Smoke detectors/ alarms shall be installed in the following areas:
 - (A) In every sleeping room or area;
 - (B) Outside every sleeping room or area in the immediate vicinity of the sleeping room or area; and
 - (C) On all levels of the dwelling, dwelling unit, rooming house, or rooming unit, including basements but excluding crawl spaces and unfinished attics.
 - (D) Notwithstanding the above installation locations, detectors/alarms shall not be located within kitchens or garages or in other spaces where temperatures can fall below 40 degrees F (4 degrees C) or exceed 100 degrees F (38 degrees C). Detectors/alarms shall not, unless specifically listed for the application, be located closer than 3 feet (0.9 m) horizontally from:
 - (*) the door to a kitchen
 - (*) the door to a bathroom containing a tub or shower
 - (*) the supply registers of a forced air heating or cooling system, and outside of the air-flow from those registers
- (2) Smoke detectors/alarms shall receive their operating power from the building electrical system but shall also receive power from a battery when the building electrical system power is interrupted.
- (3) Smoke detectors/alarms within each dwelling unit or rooming unit shall be interconnected so that the sensing of smoke by one detector sounds the alarms of all detectors within that dwelling unit or rooming unit.
- (4) Smoke detectors/alarms shall be approved or listed by a nationally recognized testing or listing agency for the purposes for which they are intended.
- (5) Smoke detectors/alarms shall be properly installed and shall be maintained in good working condition.

(b) All other dwellings, rooming houses, dwelling units or rooming units not covered by (a) shall have a smoke detector/ alarm installed adjacent to bedroom areas. Such smoke detectors/ alarms shall be approved or listed by a nationally recognized testing or listing agency for the purposes for which they are intended.

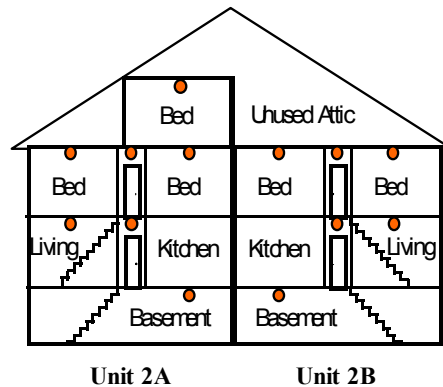
SMOKE DETECTOR PLACEMENT

Best practices for audibility and to mark & protect path of egress:

- ◆ All smoke detectors in a single apartment must be interconnected. This provides optimum protection in bedrooms for a fire starting in the basement.
- ◆ For dwellings with 1 sleeping area per floor: 1 detector in each bedroom and 1 in the hallway outside of the bedroom area, as shown in Unit 1A.
- ◆ For dwellings with more than 1 sleeping area per floor, a detector must be placed outside each sleeping area, as well as in every bedroom, as shown in Unit 1B

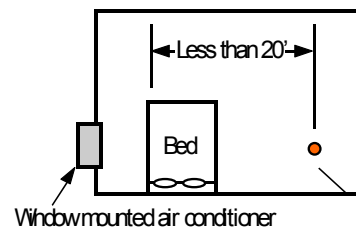


- ◆ For multi level dwellings, detectors should be located in each bedroom, in hallway/ stairs outside of each bedroom area, and at least 1 on every finished floor, including basement (see units 2A & B). (Upper floor detector should be located at the top of stairwells, so long as no other door blocks the path of smoke.)



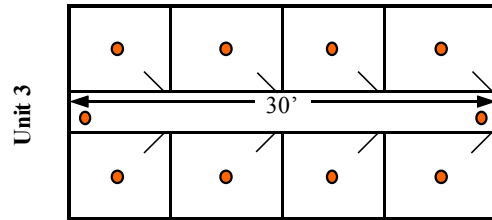
- ◆ Smoke detectors in basement areas should be located within the stairwell, at top of basement stairs (see units 2A & 2B)

- ◆ In bedrooms with window mounted air conditioners, smoke detectors must be located within 20' of the pillow. (see bedroom diagram at right)

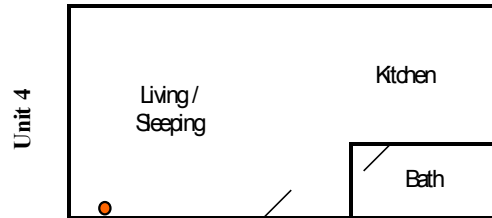


SMOKE DETECTOR PLACEMENT

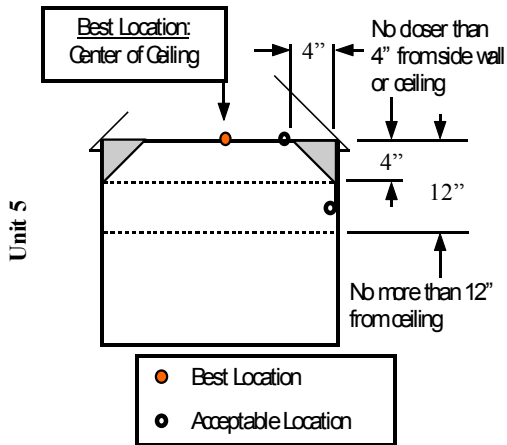
- ◆ A smoke detector shall be placed at each end of a hallway serving bedrooms, if the hallway is in excess of 30' in length, as shown in Unit 3.



- ◆ In an efficiency type apartment, smoke detectors should be placed in the sleeping area, as far away from the kitchen area as possible as shown in Unit 4. *Do not ceiling mount a detector in a room near a kitchen when there is no wall above the passageway that separates the kitchen from that room.* In this instance, mount the detector on a wall furthest from the kitchen (preventing nuisance alarms).

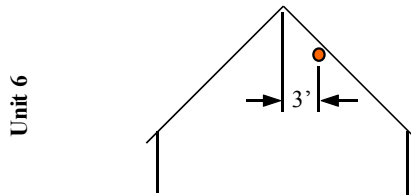


- ◆ Smoke, heat and combustion products rise to the ceiling and spread horizontally. Mounting smoke alarms in the center of the ceiling will provide the earliest warning, and the best possible protection. Ceiling mounted installation is preferred in residential construction



- ◆ If mounting near the center of the ceiling is not practical, a smoke detector may be located on the ceiling no closer than 4" (10cm) from the to the ceiling / wall junction.
- ◆ (See unit 5.)

- ◆ Smoke detectors may be wall mounted, if they are located at least 4", but not more than 12" from the ceiling, and no closer than 4" from a sidewall. (See unit 5)

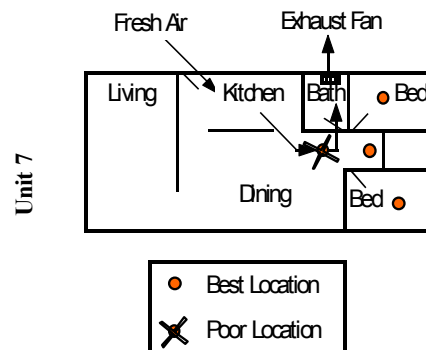


- ◆ If the room has a sloped ceiling, mount detector 3' (measured horizontally) from the highest point of the ceiling. (See unit 6)

WHERE NOT TO PLACE SMOKE DETECTORS

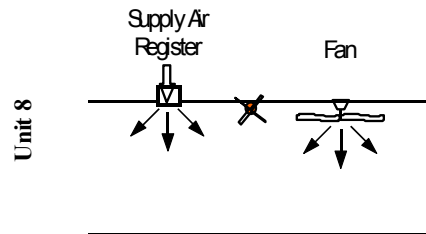
- ◆ Air Streams Near Kitchens Fresh air often enters apartments around the front door (even if the door opens into a common hallway). When the bathroom exhaust fan operates, the fan exhausts air which may be replaced by fresh air entering through the front door. If the air flow goes through a kitchen, products of combustion (from cooking activities) may enter the air under normal, fire free conditions, causing nuisance alarms.

Place smoke detector so that it is out of the air flow of 'normal' kitchen combustion products.
A more appropriate location for the detector in unit 7 is between the two bedroom doors.



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- ◆ Near Bathrooms Excessive steam from a bathroom shower may cause condensation on the detector components, causing a nuisance alarm. See unit 7. (If possible, locate detectors at least 10' away from bathrooms.)

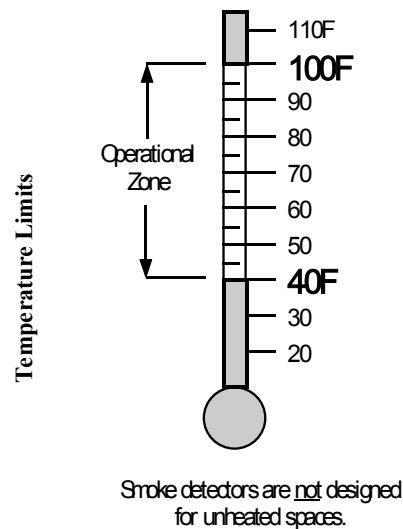


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- ◆ Drafty Areas Including areas affected by heating and cooling supply / return registers, ceiling fans, air conditioners, etc. Install detectors only where they will not be bypassed by mechanical ventilation in the room. See Unit 8.

- ◆ Garages Running automobile engines produce products of combustion which may cause nuisance alarms.

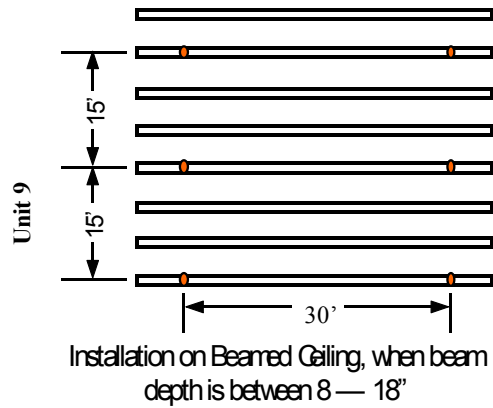
- ◆ Unheated Buildings or Rooms Most smoke detectors will not function properly at temperatures above 100F or below 40F.



SPECIAL SPACING CONSIDERATIONS

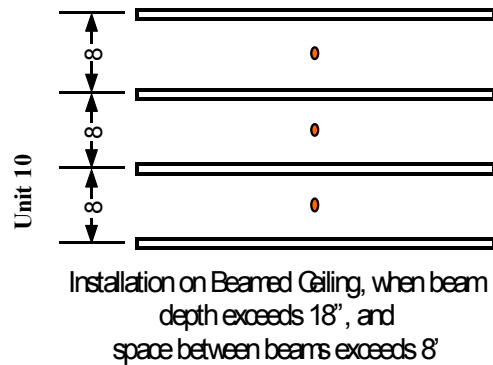
◆ Beamed Ceilings

- If ceiling beams are less than 8” in depth, detectors should be mounted in the center of the room, on the bottom of the beam (not in the channels in between)
- If beams are between 8—18” deep, detectors should be mounted on the bottom of beams, and additional detectors installed. (See unit 9)
- Movement of smoke may be slowed if beam depths exceed 8”. If beam depth exceeds 18” and are more than 8’ on center, each bay will require a separate detector. (See unit 10)



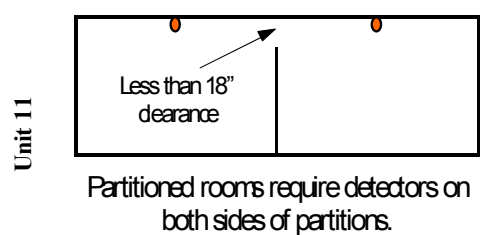
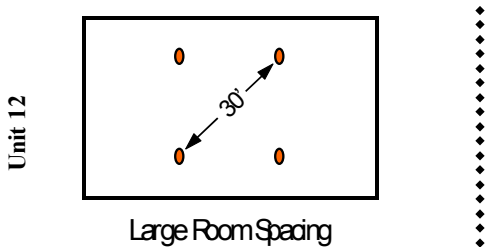
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- ◆ Partitions Any room with partitions mounted on the floor and leaving less than 18” of vertical space between the partition top and the ceiling should be considered a sidewall. Each partitioned area should have a detector. (See unit 11)



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- ◆ Large Rooms / Long Hallways Under ideal conditions, with normal ceiling heights and no physical obstructions between the property protected and a detector, detectors can be installed on 30’ centers. (See unit 12.)



AUDIBILITY REQUIREMENTS

1996 Fire Alarm Code NFPA 72, Section 6-3.4 specifies:

“Where audible appliances are installed to signal sleeping areas, they shall have a sound level of at least 15 dBa above the average ambient sound level or 5 dBa above the maximum sound level having a duration of at least 60 seconds or a sound level of at least 70 dBa, whichever is greater, measured at the pillow level in the occupiable area.”

CONTACTS

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