

Fire Alarm Codes — Most-Referenced Quick Guide (Connecticut Editions)

Adopted Editions in Connecticut (as of Aug 22, 2025)

- 2022 Connecticut State Building Code (CSBC) — based on the 2021 IBC/IFC; effective Oct 1, 2022.
- Applicable electrical code under the 2022 CSBC: NFPA 70 — 2020 National Electrical Code (NEC), with CT amendments.
- Connecticut State Fire Safety Code (CSFSC) — adopts NFPA 101, 2021 Edition (with CT amendments).
- Fire alarm installation/ITM standard used by 2021 IBC referenced standards: NFPA 72 — 2019 Edition (verify with AHJ for project-specific editions).

Always verify the adopted edition and any local amendments with the AHJ before design, submittal, or ITM. Section numbering varies by edition.

Manual Pull Stations (Manual Fire Alarm Boxes) — NFPA 72-2019, Chapter 17 (Manual Boxes)

- Mounting height: 42–48 in. above finished floor (AFF) to the operable part. [NFPA 72-2019 §17.14 (mounting/location)]
- At exits: provide on the egress side of each exit doorway; typically within ~60 in. of the exit doorway opening (verify with AHJ). [§17.14 (location at exits)]
- Travel distance: provide additional boxes so that the maximum travel distance to a pull station on the same floor does not exceed 200 ft. [§17.14 (travel distance)]
- Grouped openings >40 ft wide: provide boxes on both sides, typically within ~60 in. of each side of the opening. [§17.14 (grouped openings)]
- Visibility/obstructions: boxes shall be conspicuous, unobstructed, and accessible; signage where not plainly visible. [§17.14 (general)]

Smoke Detectors (Spot-Type, Area Protection) — NFPA 72-2019, §17.7.3

- Location: ceiling-mount or sidewall-mount with top of detector within 12 in. of the ceiling. [§17.7.3.2.1]
- Smooth ceilings: spacing per device listing; all points on the ceiling within $0.7 \times$ listed spacing (the “0.7S rule”). Nominal 30-ft listed spacing \approx 900 sq ft coverage (per listing). [§17.7.3.2.3.1 + Annex]
- Air movement/dead air: avoid dead air spaces at corners/peaks; keep detectors away from strong supply diffusers where practicable. [§17.7.3.1 & §17.7.3.2]
- Non-smooth ceilings (beams/joists): apply reduction rules and special corridor allowances (\leq 15-ft wide). [§17.7.3.2.4]

Heat Detectors (Spot-Type) — NFPA 72-2019, §17.6

- Spacing: per listing (UL 521); common nominal spacing 50 ft on smooth ceilings; apply 0.7S rule. [§17.6.3.1]
- Sidewall mounting: top of detector 4–12 in. down from ceiling. [§17.6.3.1.3]
- Beamed ceilings: if beams project >4 in., reduce spacing (often ≤ 2/3 listed spacing) measured perpendicular to beams. [§17.6.3.3.1.1]

Duct Smoke Detectors — NFPA 72-2019, §17.7.5; IBC 2021 §907; IMC/NFPA 90A

- When required: per IBC/IMC mechanical thresholds and application (e.g., fan shutdown vs. alarm).
- Installation: locate and orient per manufacturer's instructions (sampling tubes, straight-duct lengths). Provide remote indicator/test-reset where detector is not readily accessible. [§17.7.5]
- Signal type: often supervisory when used for HVAC shutdown; coordinate with AHJ and sequence of operations. [§17.7.5 + IBC §907]

Notification — Audible (Horns/Speakers) — NFPA 72-2019, §18.4

- Public mode audibility: ≥15 dBA above average ambient or ≥5 dBA above the maximum 60-s sound level, measured 5 ft AFF. [§18.4.4]
- Sleeping areas: ≥75 dBA at the pillow; where required, use low-frequency (520 Hz) appliances in sleeping rooms per code/occupancy. [§18.4.6]
- Mounting: follow device listing; typical wall/surface heights coordinated with §18.4.9 (speakers/horns). [§18.4.9]

Notification — Visible (Strobes) — NFPA 72-2019, §18.5

- Wall-mount height: lens between 80–96 in. AFF or ≥6 in. below the ceiling, whichever is lower. [§18.5.5 (figures/tables)]
- Room coverage & candela: select per Tables 18.5.5.4.1(a) (wall-mount) and 18.5.5.4.1(b) (ceiling-mount). [§18.5.5.4.1]
- Corridors: not more than 15 ft from corridor ends; max 100 ft between strobes; synchronize where multiple strobes are in the same field of view. [§18.5.5.5 & §18.5.5.5.2]

Carbon Monoxide (CO) Detection — IBC 2021 §915 (as adopted by 2022 CSBC)

- Where required: per occupancy and presence of fuel-burning appliances/garages (Groups R, I, certain E classrooms). [IBC §915]
- Integration: when connected to the fire alarm system, install/annunciate per NFPA 72 and device listings.

Power, Standby/Alarm Durations, and Amplifiers — NFPA 72-2019, Chapters 10, 23, and 24

- Minimum standby/alarm: 24 h standby + 5 min alarm (non-voice) or 15 min (voice/ECS), unless otherwise required by AHJ or listing. [Ch. 10; §24.x for ECS]

- Voltage-drop & battery calculations: required on submittals; confirm end-of-line voltage meets each device's listing. [Ch. 7, 10, 23]

Wiring Methods & Separation — NEC 2020, Article 760; NFPA 72-2019, Ch. 12

- Circuit type & cable: PLFA/NPLFA circuits; use listed FPL, FPLR, FPLP as applicable. [NEC 2020 §760.154, §760.176/§760.179]
- Separation from power: maintain separation/barriers or use raceways per §760.136 (A-G); do not mix with power conductors unless permitted conditions are satisfied. [NEC 2020 §760.136]
- Pathway classification & survivability: select Class A/B/N and survivability Level per NFPA 72 Chapter 12; document in sequence of operations. [NFPA 72 Ch. 12]

Notes & References

- Connecticut adoptions: 2022 CSBC (2021 IBC/IFC), NEC 2020 portion, 2022 CSFSC adopting NFPA 101 (2021). Verify local amendments and effective dates with the AHJ.
- Fire alarm installation, ITM, notification, and device placement are governed by NFPA 72-2019 in the 2021 IBC reference set; verify your jurisdiction's adopted edition.
- Manufacturer's listings/instructions apply in addition to the codes above.