



COLORADO • SINCE 1878

# Community Development

## Marshall Fire Statement

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**FROM: Chad Root, CBO**

**SUBJECT: Codes Changes from the 1988 UBC to the 2018 IRC**

**DATE: January 12, 2022**

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**Purpose:** The purpose of this document is to give information to owners, contractors and insurance companies of the major changes to the building code from the 1988 UBC to the 2018 IRC, 2021 IECC and the 2020 National Electrical Code. It is difficult to explain 30 years of building code changes in great detail. For example, in many jurisdictions, insulation was not inspected 30 years ago. The building code was only one book then and the electrical code has changed drastically since 1988. Currently, there are over nine code books in comparison to the one code from 1988. Below are some high level changes to the building and electrical code.

**Changes:**

- New homes will be designed by a design professional and an energy rater to ensure a HERS score of 47 before permit can be issued.
- Alternative construction is allowed (earth ram homes, straw bale, sips panels, ICF walls and foundation, etc.).
- Insulation upgrade to R-21 exterior/basement walls, R-60 ceilings, R-38 under floors over unconditioned spaces, R-5 on hot water pipes, R-8 heated air ducts, R-10 on exterior/interior of foundation walls, R-5 under heated slabs
- Windows: U-.30 on glazing; U-.50 on skylights
- Electrical:
  - In 30 years, the demand has drastically increased for electricity. Many homes in the early 1990's only had a 60-100amp service. Now the bare minimum is a 200amp service. Many homes are putting in a 400amp service for their needs.
  - ARC fault, GFCI breakers for locations throughout the home, electrical conduit to all gas appliances, 1 ready and 1 capable EV charging stations in a garage with 40 amp breakers, Zero Energy Appendix RC requires a HERS rating of 47 without renewable energy and after the rating is zero.

- On site solar
  - Smoke and carbon monoxide detectors interconnected
- Lighting controls
- Air Changes: The home will need a blower door test to verify that the leakage rate does not exceed.
- Mechanical:
  - Appliances: 96% furnace, 90% boiler, 92% on-demand water heater
  - If make up air needed in mechanical room then room is treated as an outside area and walls need to be insulated R-21, ceiling R-38 door required on room.
  - Make up air for hood exhaust exceeding 400cfm
  - Bathrooms must be vented with fan if there is no window
  - Whole dwelling mechanical ventilation system
  - Duct leakage test required
  - Ducts required to be sealed
  - Manual J&D on mechanical systems
  - Hot water circulation system
  - Drip pans under boilers and water heaters
- Framing and Design:
  - 2x6 Walls, house wrap, vapor retarder
  - Sheer wall requirements
  - Decks shall be engineered
  - Hurricane clips, hangers are required in many locations
  - 145 mph 3 second wind gust per ASCE7-10
  - Soils reports required
    - Engineered foundation required in areas
  - Foundation drain
  - Radon system
  - Natural lighting and egress requirements for basement and bedroom windows
  - Windows require water proof membrane around window
  - Tempered windows in locations
  - Ice and water shield on roofs