

## Residential Provisions – Climate Zone 3

### SUPPLEMENTAL RESEARCH INFORMATION

#### R401–R402: Building Thermal Envelope

- **Ceilings / Attic Insulation (R402.1.3)**

- *2024 IECC*: Minimum R-38 (2012 required R-38) in attics and cathedral ceilings.
- The 2024 code formally reduced R-value from R-49 (2021 edition) back to **R-38**, matching 2012 levels for this zone for constructability balance [nahb.org].
- Attic insulation inspections are now mandatory under R107.2.2 & R107.2.6.

- **Walls (R402.1.3)**

- Still requires **R-13 + R-5** (cavity + continuous) or **R-20** cavity-only insulation—similar to 2012 but with explicit high-R continuous insulation options.
- 2024 adds flexibility to use *continuous-only configurations* (R-15 ci), not allowed in 2012.

- **Floors (R402.1.3)**

- *New in 2024*: Three compliance options—cavity-only, continuous-only, or hybrid combinations. Typical for Zone 3: **R-19** cavity or equivalent assembly.

- **Slabs / Foundations (R402.1.3)**

- No prescriptive requirement for under-slab insulation in Zone 3 (same as 2012).
- 2024 clarifies definitions and insulation measurement methods—not present in 2012.

- **Fenestration (R402.1.2 & R402.1.3)**

- *2024 IECC U-factor*: **0.30 (no change from 2012)**.
- *Skylights*: now U-factor  $\leq 0.55$  (was 0.60 in 2012), a modest tightening.
- *Solar Heat Gain Coefficient (SHGC)*:  $\leq 0.25$  (no change from 2012).

- **Air Sealing / Testing (R402.4)**

- 2012 required  $\leq 5$  ACH50 for Zone 3 homes.
- 2024 maintains this but adds third-party inspection documentation requirements and mandatory recorded blower-door test results.
- Continuous air barrier verification now in inspection list (R107.2.2).

---

### **R403: Systems (Mechanical, Ducts, Ventilation)**

- **Duct Sealing:**

- Leakage testing thresholds unchanged ( $\leq 4$  CFM25 per 100 ft<sup>2</sup>), but documentation requirements expanded.
- 2024 includes exception for ducts entirely inside the conditioned envelope.

- **HVAC Efficiency:**

- Updated to reflect federal minimums for SEER2 and AFUE (e.g., 14.3 SEER2 for split cooling units vs. 13 SEER in 2012).
- Added requirements for smart thermostats and airflow verification.
- Optional Energy Recovery Ventilators may assist compliance credits; not mandated in Zone 3.

- **Water Heating:**

- 2024 allows crediting advanced controls or solar-ready connections; tank insulation R-value requirements stay similar.
- 
-

## R404: Electrical Power & Lighting

- **Lighting:**

- 2012: Minimum 75% high-efficacy lamps.
- 2024: 100% high-efficacy required; integrated control provisions for dimming and occupancy sensors for qualifying spaces [[lightingcontrolsacademy.org](http://lightingcontrolsacademy.org)].

---

## R405–R408: Compliance and Credits

- **Compliance Paths:**

- Same three paths—Prescriptive, Simulated Performance, and ERI—remain, but ERI baselines correspond to **ANSI/RESNET/ICC 301-2022**, lowering maximum ERI targets (tightened ~5 points vs. 2012).
- *Climate Zone 3 ERI target:* approximately **59–61** depending on fuel and options (the 2012 equivalent was ~68).

- **Additional Efficiency Packages (R408):**

- New menu: on-site solar readiness, EV-ready outlets, battery-ready circuits, advanced mechanical controls options—previously absent.
- 
-

## Commercial Provisions – Climate Zone 3

### C402: Building Envelope

- **Insulation:**

- Above-grade walls: increased R-values, typically **R-13 + R-7.5 ci** (was R-13 + R-3.8 in 2012).
- Roofs: changed from R-20 ci to **R-25 ci** minimum (varies by assembly).
- Slabs: still no mandatory insulation in Zone 3, but insulation continuity criteria clarified.

- **Thermal Bridging:**

- The 2024 IECC introduces explicit provisions to mitigate metal-framing and balcony thermal bridges—no equivalent in 2012.

---

### C403: Mechanical Systems

- 2024 references **ASHRAE 90.1-2022**, replacing 90.1-2010 (used by the 2012 IECC).

- **Fault Detection and Diagnostics (FDD):**

- Required for air-handling units > 5,000 CFM, with continuous monitoring and automated alerts [vertexcontrolsystems.com].

- **HVAC Controls:**

- New requirements for demand-controlled ventilation, economizer operation with high-limit shutoff, and integrated setpoint reset.

- **Equipment Efficiency:**

- Minimum SEER/EER and heating efficiencies increased in line with 2023 federal standards.
-

#### **C404: Service Water Heating**

- Added demand control recirculation requirements and higher pipe-insulation R-values; hot-water-ready provisions for renewable integration.
- 

#### **C405: Lighting Systems**

- **Lighting Power Densities (LPD):**

- Reduced ~10–15% vs 2012 across space types [[lightingcontrolsacademy.org](http://lightingcontrolsacademy.org)].

- **Controls:**

- Full-off automatic shutoff and occupancy controls required in open offices, corridors, and restrooms.
  - **Daylight zones:** continuous dimming now mandatory where skylights or sidelighting are used.
- 

#### **C406–C408: Additional Efficiency, Performance, and Commissioning**

- **Additional Efficiency Options:**

- 2024 expands list (envelope, HVAC, lighting, renewables, EV). Building in Zone 3 must select one or more options similar to 2012 but stricter performance thresholds.

- **Commissioning (C408):**

- Functional testing and documentation mandated for all new HVAC and lighting systems; optional in 2012.
  - BAS (Building Automation Systems) now must support trend logging and fault notifications.
-

## Summary – Key Takeaways for Climate Zone 3

| Category               | 2012 IECC                 | 2024 IECC (Zone 3)                                    |
|------------------------|---------------------------|---|
| Ceiling Insulation     | R-38                      | R-38 (but with verified installation)                 |
| Wall Insulation        | R-13 + R-5 ci             | R-13 + R-5 ci (new configuration flexibility)         |
| Window U-factor        | 0.30                      | 0.30 (same)   |
| Air Leakage            | ≤ 5 ACH                   | ≤ 5 ACH + mandatory reporting/inspection              |
| Lighting               | 75% high-efficacy         | 100% high-efficacy + control mandates                 |
| HVAC (comm.)           | ASHRAE 90.1-2010 baseline | ASHRAE 90.1-2022 + fault detection, higher efficiency |
| Renewables / EV-Ready  | None                      | Optional/appendix-based credits                       |
| Envelope Commissioning | Limited                   | Mandatory testing and inspection steps                |

In short, **Climate Zone 3** under the 2024 IECC sees tighter inspections, smarter controls, and more flexible envelope assembly options, while maintaining roughly the same thermal values as 2012 for this moderate zone—but with stricter verification, digital readiness, and renewable connectivity requirements.