

2021 Energy Code Building Inspector Checklist - Residential

Project Information Sheet

Permit # _____ Date _____

Project Address _____

Project Contact Info

Name _____ Phone _____

Email _____

Building Type

Single Family Detached _____ Duplex _____

Townhome _____

Multifamily (3 stories or less) _____

New Construction _____

Addition _____

Renovation _____

Compliance Approach

Prescriptive _____

UA Trade Off _____

Performance/ERI _____

Efficiency Pkg option chosen

Envelope _____ HVAC _____

Duct _____

Water heating _____

Air Sealing/Ventilation _____

Compliance Software Used

(i.e. REM/Rate, Ecotrope, REScheck, etc)

Inspector Contact Info

Name _____ Phone _____

Email _____

Jurisdiction Name _____

County _____

Climate Zone _____

Verify Substantiating Data

_____ Mechanical Load Calculations

_____ Duct design

_____ Air sealing details

Compliance Path documentation

_____ UA Trade Off: Verify REScheck or equivalent is installed

_____ Performance: Verify building features in report or equivalent is installed

_____ Energy Rating Index (ERI): Verify report with score

_____ Prescriptive: Compare R values and U factors on plan

_____ R408 Efficiency Pkg option: Verify option selected exceeds code minimum

Inspection and Project Comments:

| 2021 Energy Code Building Inspector Checklist -Residential | | | | | | | | | |
|---|--|---|--|------------------------------------|----------------|---|--|--|--|
| Thermal Envelope Compliance | | | | | | | | IECC Code Sections to Reference (For IRC, replace R4 with N11 at | |
| Insulation: (Table 402.1.2 / 402.1.3 / 402.2.6 or UA Trade-off, Performance or ERI) | | | | | | | | | |
| Every component in the table has a code section that goes with it that gives additional direction | | | | | | | | | |
| Vapor Barrier: | | Per IRC 702.7 | | | Per IBC 1404.3 | | | (R402.1.1) | |
| Slab Edge: | | | | | | | | (R402.2.9) | |
| R- | | Based on certificate on-site | | Quality of Insulation Installation | | Y / N | | | |
| Y / N | | Traded off? | | Notes: | | | | | |
| | | N/A due to Heavy termite infestation (ok per code official only) | | | | | | | |
| Crawl Space: | | | | | | | | (R402.2.10) | |
| Conditioned: | | Wall R-Value: | | R- | | Cavity and/or Continuous | | | |
| | | (Vapor Barrier and | | No outside air openings) | | | | | |
| Unconditioned: | | Floor/Ceiling R-Value: | | R- | | | | | |
| | | (Outside air openings, no conditioned air) | | | | | | | |
| Basement: Conditioned Unconditioned basements must be thermally isolated from remainder of home | | | | | | | | (R402.2.8) | |
| R- | | Cavity and/or Continuous in basement walls (excluding above grade walk out/garden levels) | | | | | | | |
| Y / N | | Insulation installed from top of basement wall down 10' or to floor, whichever is less | | | | | | (R402.2.8.1) | |
| Exterior Walls: | | | | | | | | (R402.2.5/R402.2.6) | |
| R- | | Cavity and/or Continuous | | Wood / Steel / Mass / Other | | | | | |
| R- | | Cavity and/or Continuous | | Wood / Steel / Mass / Other | | | | | |
| R- | | Cavity and/or Continuous | | Wood / Steel / Mass / Other | | | | | |
| Y / N | | Quality of Insulation Installation | | Notes: | | | | | |
| Ceiling: | | | | | | | | (R402.2.1/R402.2.2) | |
| R- | | Cavity / Continuous | | Raised Heel Trusses | | Y / N | | | |
| R- | | Cavity / Continuous | | Ceiling with Attic? | | Y / N | | | |
| R- | | Attic Access Door/Hatch | | Notes: | | | | (R402.2.4) | |
| Y / N | | Eave Baffles | | | | | | (R402.2.3) | |
| Floors over Unconditioned Space or outside air: | | | | | | | | (R402.2.7) | |
| R- | | Insulation Location Option | | 1 2 3 | | floor location | | | |
| R- | | Insulation Location Option | | 1 2 3 | | floor location | | | |
| Sunrooms & heated garages: | | | | | | | | (R402.2.12) | |
| | | Thermally Isolated? | | Y / N | | Conditioned | | Y / N | |
| Roof R-Value | | (Min R19 in CZ 0-4, Min R 24 in CZ 5-8 where thermally isolated) | | | | | | | |
| Wall R-Value | | (Min R13 all climate zones where thermally isolated) | | | | | | | |
| Fenestration: (Table 402.1.2 / 402.1.3 or UA Trade-off or Performance) | | | | | | | | | |
| Windows | | U- | | SHGC- | | Area weighted U-factor used | | Y / N (R402.3.1) | |
| | | U- | | SHGC- | | Dynamic Glazing Used | | Y / N (R402.3.2) | |
| | | U- | | SHGC- | | 15 sq ft glazing exemption used | | Y / N (R402.3.3) | |
| Doors | | U- | | | | 24 sq foot door exemption used | | Y / N (R402.3.4) | |
| | | U- | | | | Max U-factor using UA or Performance trade-offs | | | |
| Skylights | | U- | | SHGC- | | does not exceed required amount | | Y / N (R402.5) | |
| Sunroom or heated garage | | U- | | SHGC- | | fenestration | | (R402.3.5) | |
| | | U- | | SHGC- | | skylight | | | |

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Thermal Envelope Compliance
(Code Section References in Parenthesis)
Air barrier and insulation installation: Table R402.4.1.1

Additional
Prescriptive
Requirements
(R402.4)

Air Leakage:

The following items have been verified on plans per **TABLE R402.4.1.1**

| ✓ | Component | Air Barrier Criteria | Insulation Install Criteria | ✓ | (Table R402.4.1.1) |
|---|----------------------|---|---|---|--------------------|
| | General | Continuous air barrier in building envelope | No air permeable insulation for sealing | | |
| | General | Breaks or joints in air barrier sealed | - | | |
| | Ceiling/Attic | Air barrier in dropped ceiling aligns w/insulation | Insulation aligns with air barrier | | |
| | Ceiling/Attic | Access to unconditioned attics are sealed | - | | |
| | Walls | Junction of foundation and sill plate sealed | Corners/headers insulated | | |
| | Walls | Junction of top plate and top of ext. wall sealed | Insulation in contact with air barrier | | |
| | Walls | Knee walls sealed | Insulation aligns with air barrier | | |
| | Windows/doors | Spaces around windows, doors, skylights sealed | - | | |
| | Rim Joists | Rim joists include exterior air barrier | Insulation stays in contact with rim board | | |
| | Rim Joists | Rim board to sill plate & rim to sub floor sealed | - | | |
| | Floors | Air barrier installed at exposed edge of insulation | Insulation installed to one of 3 options | | |
| | Basement/crawl | Unvented crawl has vapor barrier on soil | Crawl space wall insulation per R402.2.10 | | |
| | Basement/crawl | Air seal penetrations in concrete walls/slabs | Foundation wall insulation per R402.2.8.1 | | |
| | Basement/crawl | Vapor retarders not used as air barriers on walls | Slab insulation per R402.2.10 | | |
| | Shafts/penetrations | Sealed to allow expansion & contraction | Insulation tightly fitted around utilities | | |
| | Shafts/penetrations | Utility penetrations caulked, gasketed, sealed | - | | |
| | Narrow cavities | If 1" or less and unable to insulate, must seal | Cut to fit batts or fill cavities w/ insulation | | |
| | Garage separation | Air seal between garage and conditioned spaces | Insulated assemblies per R303 & R402.2.7 | | |
| | Recessed lights | If installed in envelope, must be sealed | IC rated, buried or surround w/Insulation | | |
| | Plumbing/wiring | All holes in air barrier must be sealed | Surround w/insulation or see Table | | |
| | Shower/tub | Air barrier required behind tubs/showers on exterior walls | Exterior walls behind tubs/showers insulated | | |
| | Electric/phone box | Air barrier behind boxes or use sealed boxes | - | | |
| | HVAC register boots | Boots penetrating envelope - sealed to surface they penetrate | - | | |
| | Concealed sprinklers | Sealed per manufacturer's specs. No caulking | - | | |

Testing:

(R402.4.1.2)

Y / N

Air leakage test report available on-site: ACH/50 or CFM/sq ft/DUEA
or ANSI/RESNET/ICC 380 or ASTM E779 or ASTM E1827

(R402.4.1.3)

Y / N

Third Party Testing Required _____ 3rd party verifier

Y / N

Heated garage

_____ Mechanical Ventilation installed in accordance with IRC M1505 or IMC 403.3.2

_____ Wood-burning fireplaces have tight fitting flue dampers or doors and outdoor combustion air

(R402.4.2)

_____ Windows, skylights, sliding glass doors, and swinging doors meet air leakage requirements

(R402.4.3)

_____ Rooms containing fuel-burning appliances in Climate zones 3-8 meet air leakage requirements

(R402.4.4)

_____ Recessed lighting in the envelop is sealed to limit air leakage per the requirements

(R402.4.5)

_____ Electrical and communication outlet boxes meet air leakage requirements

(R402.4.6)

Notes:

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Mechanical System Compliance

(Code Section References in Parenthesis)

HEATING

(R403)

Installed Heating Equipment Size:

| | | |
|----------------------|------------|---|
| System #1 Input Btuh | Efficiency | % |
|----------------------|------------|---|

| | | |
|----------------------|------------|---|
| System #2 Input Btuh | Efficiency | % |
|----------------------|------------|---|

Programmable Thermostat

(R403.1.1)

Heat Pump Supplementary Heat

(R403.1.2)

COOLING

(R403)

Installed Equipment Size:

| System #1 Btuh | Efficiency |
|----------------|------------|
| 100,000 | 80% |
| 200,000 | 80% |
| 300,000 | 80% |
| 400,000 | 80% |
| 500,000 | 80% |
| 600,000 | 80% |
| 700,000 | 80% |
| 800,000 | 80% |
| 900,000 | 80% |
| 1,000,000 | 80% |
| 1,100,000 | 80% |
| 1,200,000 | 80% |
| 1,300,000 | 80% |
| 1,400,000 | 80% |
| 1,500,000 | 80% |
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| 9,600,000 | 80% |
| 9,700,000 | 80% |
| 9,800,000 | 80% |
| 9,900,000 | 80% |
| 10,000,000 | 80% |

| System #2 Btuh | Efficiency |
|----------------|------------|
| 100,000 | 85.00% |
| 200,000 | 85.00% |
| 300,000 | 85.00% |
| 400,000 | 85.00% |
| 500,000 | 85.00% |
| 600,000 | 85.00% |
| 700,000 | 85.00% |
| 800,000 | 85.00% |
| 900,000 | 85.00% |
| 1,000,000 | 85.00% |
| 1,100,000 | 85.00% |
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| 9,900,000 | 85.00% |
| 10,000,000 | 85.00% |

DUCTS

(R403.3)

Insulation

R6 ☐ 3 inch and larger supply/return ducts outside of building envelope

(R403.3.1)

| | |
|------|--|
| R4.2 | Smaller than 3 inch supply/return ducts outside of building envelope |
|------|--|

(R403.3.1)

☐ No Insulation Required- all ducts within building envelope

(R403.3.2)

| | |
|----|--|
| R8 | Ducts partially or completely buried in ceiling insulation |
|----|--|

(R403.3.3)

| | |
|-----|---|
| R19 | insulation alongside, on top of & underneath ducts buried in ceiling insulation |
|-----|---|

(R403.3.3)

| | |
|-----|--|
| R13 | ** above req for CZ OA, 1A, 2A, 3A, See code section for details |
|-----|--|

(R403.3.3)

Sealing

☐ Duct tightness test performed post-construction or ☐ Rough-in

(R403.3.5)

cfm Duct leakage rate or Being traded off Y / N Note: (R403.3.6)

☐ Duct Tightness test not required for ducts not integrated into HVAC systems only! (403.3.5, exc)

| | | |
|----------|--------------------------|--|
| Cavities | <input type="checkbox"/> | Building framing cavities not used for supply or return ducts or plenums |
|----------|--------------------------|--|

(R403.3.7)

Notes:

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System Compliance Continued

(Code Section References in Parenthesis)

| | | |
|--------------------------|---|----------------|
| OTHER | | |
| <input type="checkbox"/> | Hot water boiler temperature reset where applicable) | (R403.2) |
| <input type="checkbox"/> | Mechanical System Piping, R-3 where required , plus protection of insulation | (R403.4) |
| <input type="checkbox"/> | Heated water circulation systems have circulation pump | (R403.5.1.1) |
| <input type="checkbox"/> | Heated water circulation systems dedicated return pipe or cold water supply pipe | |
| <input type="checkbox"/> | controls for circulating HW system pumps automatically turn off pump at desired temp and no demand for hot water | |
| <input type="checkbox"/> | Controls limit temp of water entering cold water piping to no more than 104 degrees. | |
| <input type="checkbox"/> | Any demand recirc system controls start pump on a signal from a user or sensing flow | (R403.5.1.1.1) |
| <input type="checkbox"/> | Electric heat trace has controls to automatically adjust energy input to maintain the desired water temp in piping in accordance with times heated water is used in occupancy | (R403.5.1.2) |
| <input type="checkbox"/> | Hot water piping insulated to R3 where applicable per code section | (R403.5.2) |
| <input type="checkbox"/> | Where installed, drain water heat recovery units comply with CSA B55.2 | (R403.5.3) |
| <input type="checkbox"/> | Mechanical Ventilation and Whole House Mechanical Ventilation | (R403.6) |
| | IRC/IMC WHMV strategy _____ | |
| <input type="checkbox"/> | Automatic or Gravity dampers where required | (R403.6) |
| <input type="checkbox"/> | Heat or Energy recovery ventilation for Climate Zones 7 and 8 | (R403.6.1) |
| <input type="checkbox"/> | WHMV Fan efficacy- does the fan used meet the efficacies in Table R403.6.2 or approved plan set? | (R403.6.2) |
| <input type="checkbox"/> | Mechanical ventilation systems shall be tested to verify flow rates | (R403.6.3) |
| <input type="checkbox"/> | Snow & Ice Melt controls shut off system when surface temp is over 50degrees or when outside temp is over 40 degrees | (R403.9) |
| Pools | <input type="checkbox"/> Ready access for on-off switches for pool heaters where applicable | (R403.10.1) |
| | <input type="checkbox"/> Automatic time switches for pool heaters where required | (R403.10.2) |
| | <input type="checkbox"/> Vapor retardant Pool cover for outdoor heated pools | (R403.10.3) |
| | <input type="checkbox"/> Portable spas comply with APSP 14 | (R403.11) |
| | <input type="checkbox"/> Energy consumption of residential pools and permanent spas per APSP 15 | (R403.12) |
| Lighting | <input type="checkbox"/> 100% of lamps in permanently installed fixtures are high efficacy | (R404.1) |
| | <input type="checkbox"/> Exterior lighting complies with commercial lighting section C405.4 (see exceptions) | (R404.1.1) |
| | <input type="checkbox"/> Fuel gas lighting does not have continuously burning pilot lights | (R404.1.2) |
| | <input type="checkbox"/> Permanently installed lighting fixtures have dimmers, occupant sensors, or other controls see exceptions | (R404.2) |
| | <input type="checkbox"/> Exterior lighting of greater than 30 watts has proper lighting controls | (R404.3) |

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Total Building Performance Compliance Method

(R405.2)

For buildings going Total Building Performance, buildings must comply with Table R405.2 mandatory items. In old editions of the code you would see (mandatory) by a code section. Now the items that they cannot trade off are located in this table below or in R405 for this compliance path.

| SECTION and TITLE | | ✓ | Notes |
|--|---|----------|--------------|
| General | | | |
| | R401.2.5 Additional energy efficiency | | |
| | R401.3 Certificate | | |
| Building Thermal Envelope | | | |
| | R402.1.1 Vapor retarder | | |
| | R402.2.3 Eave baffle | | |
| | R402.2.4.1 Access hatches and doors | | |
| | R402.2.10.1 Crawl space wall insulation installations | | |
| | R402.4.1.1 Installation | | |
| | R402.4.1.2 Testing | | |
| | R402.5 Maximum fenestration U-factor and SHGC | | |
| Mechanical | | | |
| | R403.1 Controls | | |
| | R403.3, including R403.3.1, except Sections | | |
| | R403.3.2, R403.3.3 and R403.6 Ducts | | |
| | R403.4 Mechanical system piping insulation | | |
| | R403.5.1 Heated water circulation and temperature maintenance systems | | |
| | R403.5.3 Drain water heat recovery units | | |
| | R403.6 Mechanical ventilation | | |
| | R403.7 Equipment sizing and efficiency rating | | |
| | R403.8 Systems serving multiple dwelling units | | |
| | R403.9 Snow melt and ice systems | | |
| | R403.10 Energy consumption of pools and spas | | |
| | R403.11 Portable spas | | |
| | R403.12 Residential pools and permanent residential spas | | |
| Electrical Power and Lighting Systems | | | |
| | R404.1 Lighting equipment | | |
| | 404.2 Interior lighting controls | | |