



IRC Building Submittal Guide

A description of permit requirements for detached one and two family dwellings
and townhouses under the **International Residential Code**

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Documents

Planning Approvals (1 copy)

Check with the Planning Department to see if your project requires land use review. Any of the following that are specific to your project must be submitted:

- Resolutions
- Decisions
- Ordinances
- Development Orders
- Other Land Use Approvals

Permit Application & Contact Sheet

Fill out the entire upper portion of the form.

- **Existing Square Feet (Sqft):** Provide the Gross Floor Area (See Area Sheet section for definition) of the entire unit or house as it exists.
- **Sqft this Permit:** Provide the Gross Floor Area of the area where the scope of work will take place. This includes the area of alteration + addition.
- **Contractor:** The permit must be signed by a contractor who is licensed with the City of Aspen. Alternatively, for single family projects, the owner may sign for the permit as an owner/builder. This requires filling out the Owner/Builder Affidavit and taking the owner/builder test. You may schedule the test with the Pitkin County Building Department (970-920-5526).
- **Valuation:** Enter the project valuation in the appropriate line on the Permit Application Form. Per City Policy, the permit valuation shall include **the total value of the work for which a permit is being issued**. This includes **materials and labor** for the permanent structure and mechanical, electrical, plumbing and gas, fire sprinkler and elevator systems and equipment. Permanent systems such as audio visual, lighting and HVAC controls are included in the total as are expenses directly related to construction such as equipment rental and contractor fees.

Costs such as architectural and engineering design fees, landscaping and planting, tap fees, development mitigation fees, trash removal and cleaning are not included.

Fees

Fees will be due at submittal and at issuance. Contact a permit coordinator for an estimate at (970)920-5090.

HOA Certification (1 copy)

Form must be filled out and signed by owner.

IRC Building Description Form (1 copy)

Fill out the form completely. If you do not know the type of construction, we may have it on file at the Building Department.

Asbestos Questionnaire (1 copy)

This must be filled out for all existing projects, regardless of the age of the building.

Asbestos test and clearance reports (1 copy)

If 'YES' is checked on any of the questions on the Asbestos Questionnaire, you must provide an asbestos test report. This must include the following:

1. Inspector's narrative including sampling locations
2. Inspector's certificate
3. Lab data

If Asbestos is found and you will be disturbing it, you must submit a final air clearance asbestos abatement report.

State Asbestos Demolition Approval Notice (1 copy)

This is required if you are demolishing an entire building. One is required for each separate building, including outbuildings. You must submit the original license, not a copy. The Asbestos Questionnaire has information on how to acquire one.

Fireplace Registration and Specs (1 copy)

Applicable to projects that add or alter fireplaces. Fill out the Fireplace Registration Form for all fireplaces and fire pits existing and proposed within the building.

For factory built wood and gas log fireplaces, provide the manufacturer's installation instructions for each factory built component (no new wood burning fireplaces permitted indoors). The following must be included in the instructions per R1004 and R1005:

- Firebox clearances
- Chimney/Flue/Termination clearances

- Hearth Extension requirements
- Structural support
- Exterior air requirements (R1006)
- Damper or tight-fitting door (2015 IECC R402.4.2)
- Damper/Flue sentinel/Power vent information if applicable for gas log fireplaces

Energy Code Compliance (2 copies)

Applicable to new construction, additions, and alterations that affect the thermal envelope (exterior windows, doors, walls, roof, etc). See the Details section for air sealing requirements and the Electrical section for lighting requirements.

You must choose one of the following five methods to demonstrate energy code compliance of the thermal envelope. You must note on the plans which approach you are taking.

1. Prescriptive Alternative: Use the values out of Table R402.1.2 for insulation and fenestration (printed below). Your details, sections, and/or schedules must be noted with these R and U values.

2015 IECC Table R402.1.2 (as amended by City of Aspen Ordinance 40, 2016)

| CLIMATE ZONE | FENESTRATION U-FACTOR | SKYLIGHT U-FACTOR | CEILING R-VALUE | WOOD FRAME WALL R-VALUE | MASS WALL R-VALUE | FLOOR R-VALUE | BASEMENT WALL R-VALUE | SLAB R-VALUE & DEPTH | CRAWL SPACE WALL R-VALUE |
|--------------|-----------------------|-------------------|-----------------|-----------------------------|--------------------|-----------------|-----------------------|-----------------------|--------------------------|
| 7 | 0.28 | 0.55 | 49 | 20 +5 or 13+10 ^h | 19/21 ⁱ | 38 ^g | 15/19 ^c | 10, 4 ft ^d | 15/19 ^c |

Table Footnotes:

- c. "15/19" means R-15 continuous insulated sheathing on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. "15/19" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulated sheathing on the interior or exterior of the home. "10/13" means R-10 continuous insulated sheathing on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall.
- d. R-5 shall be added to the required slab edge R-values for heated slabs. Insulation depth shall be the depth of the footing or 2 feet, whichever is less in Zones 1 through 3 for heated slabs.
- g. Or insulation sufficient to fill the framing cavity, R-19 minimum.
- h. The first value is cavity insulation, the second value is continuous insulation, so "13+5" means R-13 cavity insulation plus R-5 continuous insulation.
- i. The second R-value applies when more than half the insulation is on the interior of the mass wall.

2. U-factor Alternative: Use the values out of table R402.1.4 from the 2015 IECC as amended (see below). You must demonstrate your calculations of the U-factor of any assemblies using this alternative, including the effects of thermal bridging of from framing materials. Your details, sections, and/or schedules must be noted with these values. You may mix this approach with the prescriptive one above.

| Fenestration U-Factor | Skylight U-Factor | Ceiling U-Factor | Frame Wall U-Factor | Mass Wall U-Factor | Floor U-Factor | Basement Wall U-Factor | Crawl Space U-Factor |
|-----------------------|-------------------|------------------|---------------------|--------------------|----------------|------------------------|----------------------|
| 0.28 | .55 | 0.026 | 0.045 | 0.057 | 0.028 | 0.050 | 0.055 |

3. Total UA Alternative: Use **Rescheck**, downloadable for free at www.energycodes.gov. The proposed design must be a minimum of 2% more efficient than the standard reference design in order to accommodate for Aspen's amended prescriptive fenestration U-factor. Be sure to address the following in your Rescheck:

- Select 2015 IECC as the code
- Under Options, choose Compliance Method: UA trade-off
- Fill out all info on the Project tab, including Project Details (not optional!)
- Fill out the Envelope tab with all of your assemblies and fenestration. See the Help section for guidance.
- The makeup and area of all assemblies must EXACTLY match the plans.
- Cavity insulation is insulation installed in the framing cavities between studs and joists. Continuous insulation is installed beyond framing and runs past it.
- Print out and sign the Rescheck. Two copies are required.

4. Simulated Performance Alternative: Use **Rescheck**, downloadable at www.energycodes.gov, or other software approved by the building official. Be sure to address the following in your Rescheck:

- Under Options, choose Compliance Method: Performance Alternative
- All the requirements of the Total UA Alternative method above apply.
- Using the performance alternative requires additional inputs including conditioned floor area, orientation of the building, a minimum of four walls having unique orientations, and a minimum of one roof and floor.

5. Simplified Equivalent Compliance Alternative: Under this approach compliance is based on adhering to minimum size for the heating and cooling systems:

1. The ratio of the air conditioning capacity to conditioned space is less than or equal to 1 ton per 1000 square feet.
2. The ratio of the space heating system capacity to floor area of conditioned space is less than or equal to 32,000 Btu/h per 1000 square feet.

The design team must provide details, sections, and/or schedules with insulation and fenestration R or U values, but any values are acceptable as long as the air conditioning and space heating capacity meets the minimum. The heating system size only intended for space heating, so if the system also supplies hot water and/or snowmelt, load calculations need to be provided to show what portion of the total output is needed for each of its uses.

This path also has two additional requirements:

- 1) The distance from the hot water supply outlet to hot water pipe to the hot water entry to a room where hot water is used shall be no more than 10ft. This shall apply to the kitchens, bathrooms with showers or tub, and rooms with a clothes washer. Provide hot water piping plans to illustrate compliance.

- 2) Lighting - at least one of the following requirements shall be deemed in compliance: 1. Lamps over 15 watts shall be CFL, LED, or have an efficacy not less than 90 lumens per watt. 2. At least 90% of the lamps or fixtures shall have an efficacy not less than 75 lumens per watt. Provide lighting plans to illustrate compliance.

Non-Vented Roof Assembly Dew Point Calculations (2 copies)

If your project adds or alters a non-vented roof assembly, you must demonstrate that it will avoid the accumulation of moisture. You must either demonstrate compliance with section R806 or demonstrate compliance with a dew point calculation. **In either case, you must submit a detail of your assembly.**

R806.5 Alternative: Unvented attic assemblies (spaces between the ceiling joists of the top story and the roof rafters) shall be permitted if **all** the following conditions are met:

1. The unvented attic space is completely contained within the building thermal envelope.
2. No interior vapor retarders are installed on the ceiling side (attic floor) of the unvented attic assembly.
3. Where wood shingles or shakes are used, a minimum 1/4 inch (6 mm) vented air space separates the shingles or shakes and the roofing underlayment above the structural sheathing.
4. Any air-impermeable insulation shall be a vapor retarder, or shall have a vapor retarder coating or covering in direct contact with the underside of the insulation.
5. Either Items 5.1, 5.2 or 5.3 shall be met, depending on the air permeability of the insulation directly under the structural roof sheathing.
 - 5.1. Air-impermeable insulation only. Insulation shall be applied in direct contact with the underside of the structural roof sheathing.
 - 5.2. Air-permeable insulation only. In addition to the air-permeable installed directly below the structural sheathing, minimum R-30 rigid board or sheet insulation shall be installed directly above the structural roof sheathing for condensation control.
 - 5.3. Air-impermeable and air-permeable insulation. Minimum R-30 air-impermeable insulation shall be applied in direct contact with the underside of the structural roof sheathing for condensation control. The air-permeable insulation shall be installed directly under the air-impermeable insulation.

Dew Point Calculation Alternative: The calculation must show that the temperature of the condensing surface (T interface) is greater than 41 degrees F at 35% relative humidity. You may use the following equation:

$$T(\text{interface}) = R(\text{exterior}) / R(\text{total}) \times [T(\text{inside}) - T(\text{outside})] + T(\text{outside})$$

Where:

T(interface) = temperature at the sheathing/insulation interface or the temperature of the first condensing surface. Must be great than 41 deg F.

R(exterior) = the R-value of the exterior sheathing

R(total) = the total R-value of the entire assembly

T(inside) = 70 deg F

T(outside) = 19.8 deg F (mean daily temp)

Example:

| <u>Thickness:</u> | <u>Component:</u> | <u>R-Value:</u> |
|-------------------|--------------------------------|-----------------|
| | Outside air layer | 0.17 |
| | Water-proof membrane | 0.21 |
| 5/8" | Sheathing | 0.77 |
| 4" | Closed-cell spray foam | 28 |
| | -----condensing surface----- | |
| 5 1/4" | Fiberglass Batt (high density) | 21 |
| 5/8" | Gypsum board | 0.56 |
| | Inside air layer | 0.65 |

$$R(\text{exterior}) = 0.17 + 0.21 + 0.77 + 28 = 29.15$$

$$R(\text{total}) = 29.15 + 21 + 0.56 + 0.65 = 51.36$$

$$T(\text{inside}) = 70 \text{ deg F}$$

$$T(\text{outside}) = -16 \text{ deg F}$$

$$T(\text{interface}) = R(\text{exterior}) / R(\text{total}) \times [T(\text{inside}) - T(\text{outside})] + T(\text{outside})$$

$$T(\text{interface}) = 29.15 / 51.36 \times [70 - 19.8] + 19.8$$

$$T(\text{interface}) = 48.3$$

The temperature at the first condensing surface (closed-cell spray foam insulation) is 48.3 degrees F. Therefore, the resulting dew point temperature of 41 degrees F would occur within the spray foam, which verifies compliance. [You can find a worksheet for this equation on our website.](#)

U-Factor Fenestration Documentation

(2 copies)

All new windows, skylights, and glazed doors must have a factory applied NFRC stickered label listing the U-factor of the entire assembly. **The maximum U-factor will be determined by Energy Code Compliance path selected (see above).** You must note on the plans that all new fenestration on the project will comply with this.

If new windows, skylights, or doors do not come with a factory applied NFRC stickered label listing the U value of the entire assembly, you must demonstrate the U value using **one of the following options** per City policy. The calculations must be for the entire assembly, including the glazing *and* the frame.

NFRC CMA certificate (preferred): Component Modeling Approach. Uses CMA Software Tool (CMAST). Speak with your window/door representative to see if this is an option. More info here:

<http://cmast.nfrc.org>

ASHRAE Calculations: Calculation methods from [ASHRAE Fundamentals Handbook: "U-Factor \(Overall Coefficient of Heat Transfer\)."](#) A calculation is required for each individual window assembly or you may calculate the worst performing window (usually the smallest) and use that U factor for every window.

Below is an example:

1. Determine U-value for the three sections of window assembly. You must look these up in the ASHRAE tables:
 - Center of Glass (Ucg)
 - Edge of Glass (Ueg)
 - Window Frame (Uf)
2. Determine Area for the three sections of window assembly. Follow the directions in ASHRAE:
 - Center of Glass (Acg)
 - Edge of Glass (Aeg)
 - Window Frame (Af)
3. Calculate the weighted average U factor, by area of the three sections:

$$U = \frac{(U_{cg} \times A_{cg}) + (U_{eg} \times A_{eg}) + (U_f \times A_f)}{(A_{cg} + A_{eg} + A_f)}$$

RREMP documents (1 copy)

Snowmelt equipment, outdoor hot tubs, and outdoor pools are required to comply with the Residential Renewable Energy Mitigation Program (RREMP). In addition to the full size RREMP plan sheets, you must submit the following to demonstrate compliance:

All:

- Completed [RREMP worksheet](#), available on the City of Aspen website.
- Specs on boiler (the boiler/heating unit for the snowmelt, pool, and/or spa), showing AFUE. (annual fuel utilization efficiency) If using solar renewable credits: The renewable credit will be determined by the system kW capacity X efficiency of the system as calculated on the RREMP worksheet. Be sure to include this tab from the worksheet.
 - Plans should show panel location, tilt, and aspect from true South.
 - Provide specs on solar panels, showing dimensions, orientation, and, if Photovoltaic, kW per panel.
-

Hot Tub:

- If using a spa that is not CEC or APSP-14 certified, you must include it in the [RREMP worksheet](#) and pay the RREMP option fee. For RREMP, the area is the area of the water surface. If installing a RREMP exempt spa, provide specs showing dimensions and CEC (California Energy Commission) or APSP-14 (Association of Pool and Spa Professionals) certification. The CEC has a database of all compliant spas at <http://www.appliances.energy.ca.gov/QuickSearch.aspx>.
- Specs on a safety cover listed as ASTM F 1346 (unless an enclosure barrier is used per 2015 International Swimming Pool and Spa Code 305)

Outdoor Pool:

- Must include it in the [RREMP worksheet](#) and pay the RREMP option fee. For RREMP, the area is the area of the water surface.
- Specs on a safety cover listed as ASTM F 1346 (unless an enclosure barrier is used per 2015 International Swimming Pool and Spa Code 305).
- Specs on a vapor-retardant pool cover (2015 IECC R403.10.3).

[Line Grade Verification Form](#) (1 copy)

Applicable if the project creates additional square footage (additions and new construction). Fill out part A.

Verification of Structural Integrity (2 copies)

For alteration, demo and repair work minor in nature; if any walls, or other potentially structural elements are being altered, whether bearing or non-bearing, verification in one of the following forms may be accepted in lieu of a structural plan prior to demo:

Stamped Letter Option: A letter stamped and signed by a structural engineer or architect stating that they will be involved with the project and certifying the structural integrity of the proposed demolition or other work. Once finishes have been removed, if it is determined that structural bearing components will be altered, a structural plan will be required.

Original Framing Plans Option: Provide the original framing plans demonstrating that the elements you are proposing to alter are non-bearing and not part of the structural frame. If during construction it is determined that the existing structure does not match the original plans, a new structural plan or stamped letter will be required.

Soils Report (1 copy)

Applicable for new construction and additions if the load bearing capacity of the soil is assumed to be greater than 2000 psf. Must comply with the [City of Aspen Soils Report Requirements](#). Alternatively, a letter from a geotechnical engineer committing to excavate and then confirm assumptions or a letter from a geotechnical engineer to use a soils report from an adjacent property may be submitted if approved by the building official.

Smuggler Superfund Soil Removal Permit (1 copy)

Applicable to any soil disturbance in the [Smuggler Mountain Superfund zone](#). If your project is within the red boundary lines of the [Superfund Map](#), then this applies to you.

Signed Special Inspection and Testing Agreement (2 copies)

In addition to Inspections per Sec R109, other inspections per R109.1.5 may be required by the building official. Work that includes any of the following requires special inspection per 2015 IBC section 1704.

- High strength bolting
- Epoxy anchors
- Structural steel welding
- Prestressed tendons
- Permanent micropiles or helical piers
- Sprayed fire resistant materials
- Mastic and intumescent fire resistant coatings

The Special Inspection and Testing Agreement may be turned in later in the submittal process; it is not required at submittal, but is required prior to sign off and issuance. The agreement must be signed by the following entities:

- Special Inspection Agency** (must be hired by the owner or owner's authorized agent. NOT by the contractor)
- Owner**
- Engineer/Architect**
- Contractor**
- Fabricator (either approved or inspected)***

*Approved fabricators may inspect their own shop fabrication, but must have their field work inspected by the special inspector. Inspected fabricators must have all of their work inspected by the special inspector.

Mechanical Documents (1 copy)

For all projects: Submit cut sheets and/or installation instructions for any new equipment as necessary to demonstrate code compliance.

See also Mechanical Plan Section

Photos (1 copy)

Provide photographs of the proposed work areas. (optional: to aid plans examiner for better understanding of existing conditions)

Unit/Building Relationship (1 copy)

For alterations and additions to duplexes and townhouses only. Provide an elevation, section, or photograph clearly outlining and showing the relationship of the unit being altered to the remainder of the building. Highlight your unit and show neighboring units.

Class A Roof Assembly Documentation

(1 copy)

For all new roofs and reroofs, a Class A assembly is required by Ordinance 40, 2016. Provide documentation that your assembly is listed as a Class A assembly. This is typically an ESR or UL report. Provide roof details in the plans to match the report.

Construction Drawings Set

Drawing Standards

- For paper submittals, submit two full sets of plans at 24" x 36" size sheets, as well as one reduced 11" x 17" set. Other sizes are not accepted under any conditions. For electronic submittals, refer to the [electronic submittal standards](#).
- Do not fold any of the plans.
- All sheets in a drawing set must be the same size, sequentially labeled, dated and have a page title/description.
- Include North arrow and the scale [standard architectural or engineering scales (1/4"=1', etc)].
- 1/4" scale is preferred. Minimum scale is 3/16".
- Title block with project name, project address and legal description.
- Include matching gridlines on all drawings.
- All structural plans, details and calculations must be prepared, stamped, and signed by a professional engineer or architect licensed in the state of Colorado (digital copy of seal and signature is sufficient).
- Architectural drawings do not require a stamp for single family buildings per Colorado Revised Statutes.
- Existing/Demolition plans and elevations** shall be grouped together prior to the proposed plans.
- All drawings must differentiate between existing and proposed construction.**
- Provide **floor plans of the entire unit**, not just the area of work.
- The floor plans should be ordered from lowest floor to the highest floor (i.e. basement, first floor, second floor).
- All Change Orders shall highlight with clouds or bubbles all areas changed, and **include a bulleted list of the changes**. All changes must be identified in this manner. Corrections made to a permit during the review process shall not have clouds or bubbles, only change orders should have revision clouds.
- The sheets must be in the order shown below.
- Some items below are repeated on different sheets. It is not required to have these items shown multiple times, just be sure to show in one of the listed locations.

Cover Sheet

- Contact Info for all involved parties, Designer or Architect, Structural Engineer, Mechanical Engineer, Civil Engineer, Contractor, Owner and if Owners Representative
- Table of Contents: index of sheets in the same order presented in this guide.
- Planning approvals**. Print *every page of every approval* on the cover sheet, if it won't all fit, add additional sheets.

Survey

For new construction and additions. Must be drawn per the [Compliant City of Aspen Survey Checklist](#).

Excavation/Earth Retention Plans (under

Chapter 18 of the 2015 IBC and City of Aspen Engineering Standards)

- Plans for Temporary and/or Permanent Soil Nails and Micropiles (must be stamped by engineer), or a site plan that includes layback area and profile. Site plan must show adequate space on site for a one-to-one layback (the proposed foundation walls are within a horizontal distance less than the vertical depth of excavation of any existing travel way, structure, or property line.)

Site Plan

For new construction, additions, and exterior alterations. Include the following:

- Property lines, building setbacks, building envelopes, and easements
- Exterior walls, roof lines, and overhead building projections with dimensions that tie the building to the property line and other buildings on the same lot.
- Provide the equivalent grade to architectural 100'. (i.e. 100' = 7495.5')
- Show horizontal dimensions that 'tie the building to the property boundary
- All development, including: Structures, decks, patios, walls, retaining walls, fences, gates, walkways, fire pits, water features, railings, pergolas, trellises, vehicular access, parking areas, vehicular turn-arounds, driveways, carports, condensers, equipment, etc
- Fire truck access, including distance and width, and turnarounds
- Adjacent streets, alleys, adjacent building properties
- Existing and proposed grades including spot elevations
- Locations of all utility meters and shutoffs
- Design flood elevations, flood hazard areas, and floodways (if applicable)
- May show RREMP sheet information if preferred.

Residential Renewable Energy Mitigation Program (RREMP) plan

- Show all snowmelt areas in plan, provide individual area square footages and the total square footage.
- R-10 insulation detail under snowmelt. Must be rigid foam, no bubble wrap.
- Solar panels shown on plan. Photovoltaic: kW, orientation, slope, and height above roof. Thermal: square footage, orientation, slope, and height above roof.
- Spas and pools.
- Enclosure barriers or listed covers for pools and spas
- You may choose to put all of this on the Site Plan instead if it can be done legibly.

Area sheet

Illustrate and calculate building gross floor area as defined by 2015 IBC section 1002 for all structures.

FLOOR AREA, GROSS. The floor area within the inside perimeter of the *exterior walls* of the building under consideration, exclusive of vent shafts and courts, without deduction for corridors, stairways, closets, the thickness of interior walls, columns or other features. The floor area of a building, or portion thereof, not provided with surrounding *exterior walls* shall be the usable area under the horizontal projection of the roof or floor above. The gross floor area shall not include shafts with no openings or interior courts.

Commentary: Gross floor area is that area measured within the perimeter formed by the inside surface of the exterior walls. The area of all occupiable and nonoccupiable spaces, including mechanical and elevator shafts, toilets, closets, mechanical equipment rooms, etc., is included in the gross floor area. This area could also include any covered porches, carports or other exterior space intended to be used as part of the building's occupiable space.

Illustrate and calculate fire area as defined by 2015 IBC section 902. If the fire area is greater than 5000sqft, a fire sprinkler system is required per Ordinance 31, 2011.

FIRE AREA. The aggregate floor area enclosed and bounded by fire walls, *fire barriers*, *exterior walls* or *horizontal assemblies* of a building. Areas of the building not provided with surrounding walls shall be included in the fire area if such areas are included within the horizontal projection of the roof or floor next above.

Floor plans

Required for all permits

- Existing drawings** preceding proposed drawings
- Room uses labeled
- Gridlines
- Section, detail, and assembly callouts
- Finish Floor elevations
- Floor finish material
- Carbon monoxide and smoke detector locations (Aspen Municipal Code Ch 8.15)
- Door swings with floor levels shown on both sides (R311)
- Exterior landings, landing surface slope. (R311)
- Stairs and ramps: direction of travel, handrails (must return), guardrails. (R311)
- Toilet and bathing fixture clearances, any safety glazing located in shower enclosures, shower windows, etc. (R307.1, R308.4)

- Show safety glazing where applicable. (R308.4)
- Windows and doors with coordinated labeling system matching schedule and, if applicable, Rescheck.
- All appliances and equipment labeled. Show clearances and access (per Manufacturer's instructions & 2015 IMC 306)
- Show location of electric panel (cannot be located in a bathroom or storage closet, and must have minimum 3' by 3' clear space. (NEC 110.26)
- Fireplaces and hearth extensions. Note type of fireplace. (Ch 10)
- Attic and crawlspace access sizes. (R408.4, R807.1)
- Emergency escape and rescue openings. Height of sill above finish floor, opening size. Show overhead projections of any deck, porches or balconies above, if any. (R310)
- Window well dimensions, show ladder. If covered with a grate, it must require no more than 15lbs of force to open and permit the passage of smoke. If well is in walkway, provide guards as a grate could be obstructed and is not permitted. (R310, policy)
- Projections of patio covers, trellis, pergolas or any other similar overhead structures. Dashed outline of roof above. (policy)
- Garage/dwelling separation, including door. (R302.6)
- Dwelling separations and all fire rated assemblies (for two family and townhouses) (R302.3, R302.2)
 - Fire resistive (and STC/IIC per Appendix K) walls, floors, ceilings, roofs, and shafts
 - Continuity clearly shown
 - Callouts referencing details
- Fire rated openings, doors, and windows
- Below grade ejectors, sump pumps
- Floor drains
- Electrical panel location with 30"x36" working space in front (may not be in a bathroom or clothes closet)

Roof Plan

Applicable to roof work.

- Existing drawings** preceding proposed drawings
- Drains, downspouts, gutters, scuppers and secondary drains/scuppers.
- Skylights with coordinated labeling system matching schedule and, if applicable, Rescheck.
- Flue, exhaust, and chimney terminations and intakes with dimensions to property lines and openings.
- Roof pitches shown as x:12, crickets
- Solar panels with orientation, slope, and height above roof (unless shown on REMP or site plan).
- Rooftop equipment
- Roofing material and class (Class A required in all locations per Ordinance 40, 2016)
- Roof/attic ventilation. Sec R806.2 If using the ratio 1/300 with ventilators, show calculation area of how the 50 to 80% area required by ventilators are located at least 3' above eave or cornice

and the balance provided with eave or cornice vents. See alternate non-vented roof assembly option.

- Show exterior walls below with dashed line.
- Snow stop locations. These are required anywhere a roof could shed ice and snow onto potentially occupied areas such as a walkway, stairway, alley, deck, pedestrian and vehicular exit from buildings or areas where there is potential for personal injury or property damage and areas directly above or in front of gas utility or electric utility meters. (Ordinance 40, 2016) R903.6 Snow shed design.
- FYI (this does not need to be on plans but must be installed): Ice dam barrier of at least two layers of underlayment cemented together or of a self-adhering polymer modified bitumen sheet shall extend from the roof eave edge at least six feet inside the exterior wall line as measured along the roof surface, eighteen inches from the centerline of the valley and up twenty-four inches on the vertical wall at a roof and wall juncture. (Ordinance 40, 2016) R905.2.7.1 Ice Barrier

Elevations

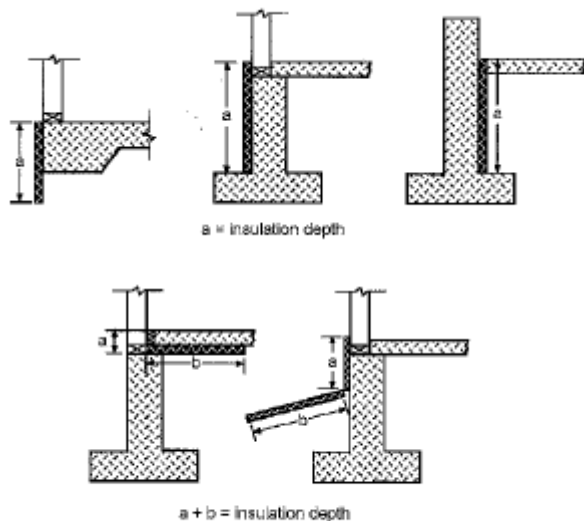
Required for any exterior work, including exhausts, windows, etc.

- Existing drawings** preceding proposed drawings
- Show proposed grade, underground structure and window wells
- Show windows, skylights and doors with opening size and door swing operation in dashed lines. With coordinated labeling system matching schedule and, if applicable, Rescheck.
- Interior finish floor levels as dashed lines, including stairs
- Exterior stairs, with guards and handrails.
- Note fall protection requirements at windows where the bottom of the opening is more than 72" above finished grade and is less than 24" above interior finished floor. (R312.2)
- Egress windows labeled, height of bottom of opening dimensioned. (R310)
- Safety glazing labeled on windows. (R308.4)
- Vents, intakes, and exhausts with distances to openings. (2015 IMC 401.4, 501.3.1)
- Chimneys and flues with heights above roof penetration and building elements within 10'. (Manufacturer's instructions, R1003.9)
- Finish materials, exterior walls, roofs
- Protection of wood and wood based materials from decay, wood to earth separations (R317)
- Landings at doors and stairways (R311)
- Water, electric, and gas service and meter locations (per utilities)
- Snow stops (see requirements in Roof Plan reqs.)

Sections

- Detail and assembly references
- Show stair and ramp enlargement sections with guardrails, handrails, landings, risers, treads, nosing, vertical rise, slope, & headroom. Include dimensions. (R311)

- Gypsum board on ceiling and walls of any enclosed usable space under stairs. (R302.7)
- Show heights of ceilings, dropped ductwork, dropped beams, dropped ceilings, and soffits. (R305)
- Show the thermal envelope continuity. This means that you should be able to put your pen down on paper and trace insulation around the entire envelope without having to lift your pen. Must be continuous or you must account for gaps/thermal bridges using the UA trade off in Rescheck. Some common mistakes:
 - At the connection of the exterior wall and the foundation and floor. If the floor joists are hung from the foundation wall, rather than sitting on top, you will need to insulate the portion of the foundation wall above the floor up to the framed wall.
 - Steel beams and columns in the thermal envelope. To avoid thermal bridging, the steel member should not create a gap in the continuous thermal envelope.
 - Forgetting slab edge insulation. See the options below. Not needed if top of slab is 12" or more below grade. (2015 IECC R402.2.10)



**Figure 402.2.8
SLAB INSULATION METHODS**

- Skylights with distance above finish floor
- Roof/attic and crawlspace ventilation. (R806, R408)
- Dwelling separations and all fire rated assemblies for two family and townhouses. (R302)
 - Fire resistive (and STC/IIC) walls, floors, ceilings, roofs, and shafts
 - Extents clearly shown
 - Callouts referencing details
- Note where fire blocking and draft stopping will be installed. Show in any details as necessary.
- Note exterior projections and/or concealed construction requiring sprinkler protection.

Details

- All wall, floor, ceiling, and roof assemblies
 - Roof details must match the Class A roof assembly documentation
- All assembly, wall, floor, roof, parapet, eave, and ceiling intersections
- All intersections of dissimilar materials, corners and ends
- All insulation (rim joists, slab edge, etc.). No thermal breaks.
- Air barrier and vapor barrier continuity at the thermal envelope (2015 IECC Tab e R402.4.1.1):
 - All joints, seams and penetrations
 - Site built windows, doors and skylights
 - Openings between window and door assemblies and their respective jambs and framing
 - Utility penetrations
 - Dropped ceilings or chases adjacent to the thermal envelope
 - Knee walls
 - Walls and ceilings separating a garage from conditioned spaces
 - Behind tubs and showers on exterior walls
 - Common walls between dwelling units
 - Attic access openings (provide a detail showing insulation and air sealing)
 - Rim joist junction
 - Other sources of infiltration
- Foundation waterproofing or damp proofing (R406)
- Flashing, drainage plane
- Details around openings such as windows doors and skylights (including skylight curb height)
- Ext. wall Finishes (masonry sills, window sills etc.)
- Dwelling separation **wall** assemblies (for townhomes, duplexes, ADUs)
 - Must be 1 hour (R302.2, R302.3)
 - Must have a Sound Transmission Class (STC) rating of 45 or greater (IRC Appendix K)
 - Choose an assembly from our **preapproved assembly list**; choose one listed to UL 263 or ASTM E 119; choose one from 2015 IBC 720; or create one from 2015 IBC 721.
 - **Print each page of the chosen assembly's installation instructions on the plans.**
- Dwelling separation **floor** assemblies (for townhomes, duplexes, ADUs)
 - Must be 1 hour (R302.2, R302.3)
 - Must have a Sound Transmission Class (STC) and an Impact Insulation Class (IIC) rating of 45 or greater (IRC Appendix K)
 - Choose an assembly from our **preapproved assembly list** (Additional information section below); choose one listed to UL 263 or ASTM E 119; choose one from 2015 IBC 720; or create one from 2015 IBC 721.
 - **Print each page of the chosen assembly's installation instructions on the plans.**
- Exterior walls closer than 5 feet to the property line
 - Must be 1 hour (R302.1)
 - Choose an assembly from our **preapproved assembly list** (Additional information section below); choose one listed to UL 263 or ASTM E 119; choose one from 2015 IBC 720; or create one from 2015 IBC 721.

- **Print each page of the chosen assembly's installation instructions on the plans.**
- Roof overhangs and other projections closer than 5 feet to the property line
 - Must have one layer of Type X gypsum product on the underside (R302.1)
- Show all penetrations and transfer openings through fire resistive assemblies and provide listed product specs.
- Fire blocking and draft stopping. Note or show in any details as necessary.
- Masonry veneer assembly, support and weep holes.
- Protection of foam plastic with thermal barrier. R316.4
- Fireplace details (for gas log and hearth alterations to wood burning fireplaces)
 - Dimensions, including firebox opening (R1001.6)
 - Firebox construction (R1001.5)
 - Firebox and chimney/flue clearances to combustibles (R1001.11)
 - Hearth extension dimensions, construction, and support (R1001.9, R1001.10)
 - Firebox and hearth extension structural support (R1001.9)
 - Exterior air supply (R1006.1)
 - New or altered wood burning fireplaces and gas logs must have tight-fitting doors and exterior air supply. (2015 IECC R402.4.2)
 - Chimney/Flue/Termination clearances (R1003.9, R1003.18, R1005)

Schedules

- Windows and Skylights: size, U factor, emergency escape, safety glazing, fall protection
- Door: size, clear opening width, U factor

Reflected Ceiling Plans

- Permanently installed light fixtures
- Skylights
- Soffits and furred/dropped ceilings, dropped beams, vaulted and cathedral ceilings, sloped ceilings.
- Attic access size

Mechanical Plans (under the 2015 IMC)

Mechanical Plans are required for new construction and should be prepared by a licensed mechanical engineer or licensed mechanical contractor. Drawings should include the following:

- Basic one-line schematic drawing of the HVAC system
- Show all intake, exhaust, flue, and vent outlets with dimensions to openings and property lines
- Equipment layout with access, working space, and clearances
- Equipment schedule
- Description of all systems and sequence of operation

- Winter/summer indoor and outdoor design temperatures listed on the plan. Must fit within the following parameters:
 - Winter indoor temp may not be above 72 deg F (2015 IECC R302.1)
 - Winter indoor temp may not be below 68 deg F (2015 IRC R303.8)
 - Summer indoor temp may not be below 75 deg F (2015 IECC R302.1)
 - Summer outdoor design temp: 82 deg F (Ordinance 40, 2016)
 - Winter outdoor design temp: -15 deg F (Ordinance 40, 2016)
- Kitchen Hood CFMs and interlocked makeup air if over 400cfm
- Dryer duct length, CFMs and makeup air as required by 2015 IMC 504.6
- All fireplaces, sizes, types, and venting
- Radiant floor locations
- A whole house balanced mechanical ventilation system (Ordinance 40, 2016). Show your calculations or use our [ventilation calculator](#) and print it out.

The minimum continuous outdoor airflow rate shall be determined in accordance with the following equation:

$$Q_r = ((0.01 \times A_{\text{floor}}) + [7.5 \times (\text{Nbr} + 1)]) \times S_c$$

where:

Q_r = ventilation flow rate, cubic feet per minute (cfm)

A_{floor} = floor area in square feet (ft²)

Nbr = number of bedrooms, not less than one

S_c = 0.75 (system coefficient for balanced systems)

Exception: The outdoor air ventilation system is not required to operate continuously where the system has controls that enable operation for not less than 1 hour of each 4-hour period. The average outdoor air flow rate over the 4-hour period shall be not less than that prescribed by the equation.

- Note fuel type and combustion air requirements for existing equipment to remain.

See also Mechanical Documents Section

Lighting Plans (under the 2017 NEC, 2015 IECC)

- Permanently installed light fixtures
- Lighting Schedule, note IC rated cans
- 75% of all lamps in permanently installed fixtures must be high efficacy. Clearly show on the plan and schedule which lamps are high efficacy and which are not. Provide the total number of high efficacy and the total number of non-high efficacy. (2015 IECC R404.1)
- High efficacy lamps are defined by 2015 IECC R202 as:
 - 60 lumens per watt for lamps over 40 watts
 - 50 lumens per watt for lamps over 15 watts to 40 watts
 - 40 lumens per watt for lamps 15 watts or less

Structural Plans (under the 2015 IBC)

Required for new construction, additions, and structural alterations.

- Reference to soils report or soil bearing capacity assumption signed letter from structural engineer

- Design load criteria, wind speed & exp. category, ground snow load, and seismic category. All to match City's amended design criteria Ordinance 40, 2016
- Foundation plan: footing, pad and foundation wall sizes, steps, and elevations; cross sections showing reinforcement
- Frost protection depth
- Roof and floor framing plans
- Locations and sizes of all framing components
- Hangers
- Header sizing
- Fasteners and welds
- Shear walls/bracing locations and nailing requirements
- Material types, grades and species identified
- Details referenced in plans
- Masonry Support
- Special Inspections program, list the elements and periodic or continuous inspections required

Radon Plan (Under 2015 IRC Appendix F)

For new construction & additions

- Details for membrane under slabs and crawl spaces
- Radon Vent location
- Power to location and access for future fan

Additional Information

Adopted Codes & Standards

The following codes as amended by Ordinance 40, 2016

- [2015 IRC](#) (International Residential Code) Chapters 1-10
- [2015 IRC](#) appendixes:
E: Manufactured homes, F: Radon, J: Existing Buildings & Structures, H: Patio Covers, K: Sound Transmission.
- [2015 IPC](#) (International Plumbing Code)
- [2015 IMC](#) (International Mechanical Code)
- [2015 IFGC](#) (International Fuel Gas Code)
- [2015 IECC](#) (International Energy Conservation Code)
- [2015 IFC](#) (International Fire Code)
- [2015 IEBC](#) (International Existing Building Code)
- [2015 ISPSC](#) (International Swimming Pool and Spa Code)
- [2015 ISEP](#) (International Solar Energy Provisions)

- 2014 NEC (National Electrical Code) (will adopt the 2017 when the State of Colorado adopts)

Design Criteria

As adopted by Ordinance 40, 2016:

| | |
|----------------------------------|-----------------------|
| Ground snow load | 100 psf |
| Wind Speed /Exposure Category | 89/B |
| Seismic design category | C |
| Weathering | Severe |
| Frost line depth | 36" |
| Termite | None to slight |
| Decay | None to slight |
| Winter design temp | -15 deg F |
| Summer design temp | 82 deg F |
| Ice shield underlayment required | Yes |
| Flood hazards | See Sec. 8.20.020(bb) |
| Air Freezing index | 2000 |
| Mean annual temperature | 40 degrees |

Per City Policy:

- Indoor design relative humidity: 35%

Fire Sprinklers

As adopted by Ordinance 40, 2016:

- Automatic fire sprinkler systems are required in all structures 5,000 square feet or greater as defined by fire area and in structures 2 stories or more in height and in structures containing 4 or more dwelling units.

Carbon Monoxide Detectors

As adopted by [City Ordinance](#): all owners of existing residential occupancies shall come into compliance with the requirements of Chapter 8.15 Carbon Monoxide Detectors. The ordinance became effective on March 2, 2009 and applies to all existing, new and altered dwelling units.

Inspections

See the [City of Aspen Inspection Checklist](#) for a list of potential inspections your project may require.

Final Inspection Expectations

Prior to Final inspection, you must have/complete the following:

1. Have final signoffs from each review agency, including:
 - a. Zoning
 - b. HPC
 - c. Engineering
 - d. Fire
 - e. Water
 - f. Sanitation
 - g. Parks
 - h. Environmental Health
2. Manuals for all appliances and equipment must be compiled together in one location for the owner.
3. A certificate must be permanently affixed on or in the electric panel with the following information per 2015 IECC R401.3:
 - a. List all insulation R values and fenestration U factors.
 - b. List types and efficiencies of all heating, cooling, and service water heating equipment.
4. Submit a complete set of as-built drawings for the project.

Permit Process: What to Expect

Schedule a Submittal Meeting

Once you have assembled all the drawings and documents required by the checklist, call to schedule a Submittal Meeting. You will sit down with a Permit Coordinator who will go through the checklist with you to make sure your application is complete. If it is not, you will be asked to come back another time with the complete package. It is recommended to have a Pre-Submittal Meeting prior to submittal with a Permit Coordinator and a Plans Examiner so that you have a clear understanding of what you will need to submit.

Permit Review

Once submitted, your permit will sit in the queue waiting for the various Review Agencies to look at it. The Permit Coordinator will let you know which agencies will be reviewing and will be your point of contact for status inquiries.

Receive Comment Letter

You will receive comments from review agencies as they review your permit. You must wait until you have received comments or a sign off from all relevant review agencies prior to submitting your responses.

Create Response and Schedule a Re-Submittal Meeting

Schedule a Re-Submittal Meeting with the Permit Coordinator once you have addressed all the comments from all the review agencies. Bring a copy of the comments along with your **written response to each comment** in both physical (8 ½ x 11) and digital format (word doc). Each response should include a description of how the comment has been resolved and which drawing or document has been revised. The Permit Coordinator will go through this list item by item with you to ensure everything has been addressed before accepting the revisions.

Permit Review

The Permit now goes back in the queue and the process continues until all Review Agencies have signed off. You will then be contacted to pick up and pay for your permit.

Changes During Construction

If changes are made to the design such that the drawings no longer match the proposed work, contact a permit coordinator. Depending on the scope of the change, a Change Order permit may be required; if the changes are insignificant enough, it may be sufficient to simply submit as a clarification.