THE CITY OF ASPEN

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.

  It is the applicant's responsibility to provide the valuation according to 2009 IRC section R108.3. The valuation is ultimately determined by the building official and documentation presented to the building official. Following is the policy for determining permit valuation:

Deed Restricted	$250/square foot
Good	$400 to $600/ square foot
Luxury*	$600 to $1,000/ square foot

Remodel valuation will be calculated as 2/3 the valuation for the above new construction.

***** The typical Luxury classification is a structure with any of the following features:

1. The bathroom and powder room to bedroom ratio is greater than 1:1; i.e. 5 bathroom/powder room, 4 bedrooms is 1.25:1
2. Two or more of the following "spare" rooms: wine room, media room, exercise or massage room, indoor or outdoor pool or spa, portecochere, more than a two car garage, or master and guest suite arrangements.
3. Two or more structural design features: bearing complexity (steel frame), sloping site requiring retaining or stabilized walls, barrel vaults or multiplane roof design
4. Luxury: any structure in the R/MF zone; Good: any structure in the R/MFA zone and any affordable housing unit.

If your project valuation does not fall within the above ranges, you must submit the following:

☐ Construction Bid
☐ Signed Valuation Adjustment Affidavit agreement to a use tax audit

The bid will not become public record. All valuation adjustments are subject to approval by the building official. You will be audited after certificate of occupancy is issued.

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)
- ☐ Gasketed door information (2009 IECC 402.4.3)
- ☐ 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 may use of one of the following four 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 402.1.1 Insulation and fenestration requirements by component from the 2009 IECC for climate zone 7 (printed below). Your details, sections, and/or schedules must be noted with these R and U values.

2009 IECC Table 402.1.1

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	0.35	0.60	49	21	19/21[i]	38[g]	15/19[c]	10, 4 ft[d]	10/13[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.
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 402.1.3 from the 2009 IECC for climate zone 7. 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.

3. Total UA Alternative: Use **Rescheck**, downloadable for free at www.energycodes.gov. Be sure to address the following in your Rescheck:

- ☐ Select 2009 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.
- ☐ A benefit of using the Performance Alternative is that you do not need to comply with 404.1 of the 2009 IECC. **This means you will not be required to have 50% of all lamps be high efficacy.**

*For new construction, all alternatives will require a **blower door test** of less than 7 ACH at 50 Pa per 2009 IECC 402.4.2.1 prior to final inspection.

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.**

R806.4 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(interface) = R(exterior) / R(total) x [T(inside) – T(outside)] + T(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:

Thickness:	Component:	R-Value:
	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(exterior) = 0.17 + 0.21 + 0.77 + 28 = 29.15
R(total) = 29.15 + 21 + 0.56 + 0.65 = 51.36
T(inside) = 70 deg F
T(outside) = -16 deg F
T(interface) = R(exterior) / R(total) x [T(inside) – T(outside)] + T(outside)
T(interface) = 29.15 / 51.36 x [70 – 19.8] + 19.8)
T(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. This **U-factor must match what you selected in the Energy Code Compliance section 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:

$$U = \frac{(Ucg \times Acg) + (Ueg \times Aeg) + (Uf \times Af)}{(Acg + Aeg + Af)}$$

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 mentioned later, you must submit the following to demonstrate compliance:

All:

- ☐ Completed RREMP worksheet, available on the aspenpitkin.com website.
- ☐ Specs on solar panels, showing dimensions, orientation, and, if Photovoltaic, kW per panel. **You may only get credit for solar panels oriented per the Orientation Adjustment Factor Table below.**
- ☐ Specs on boiler (the boiler/heating unit for the snowmelt, pool, and/or spa), showing AFUE. (annual fuel utilization efficiency)

Hot Tub:

- ☐ 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. 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.
- ☐ Specs on a safety cover listed as ASTM F 1346 (unless an enclosure barrier is used per 2009 IBC 3109.4) and that is insulated to R-12 (2009 IECC 403.9.3).

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 2009 IBC 3109.4).
- ☐ Specs on a vapor-retardant pool cover (2009 IECC 403.9.3).

Solar Orientation Adjustment Factor:

	Collector Tilt, Degrees From Horizontal									
		0	**10**	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**
	0	87.0%	93.2%	97.6%	99.9%	100%	98.0%	93.9%	87.8%	80.0%	70.7%

Collector Aspect Degrees From True South											
	10	87.0%	93.1%	97.4%	99.7%	99.8%	97.7%	93.6%	87.6%	79.9%	70.7%
	20	87.0%	92.8%	96.9%	99.0%	99.1%	97.1%	93.0%	87.1%	79.6%	70.7%
	30	87.0%	92.4%	96.1%	98.0%	97.9%	95.9%	92.0%	86.2%	79.0%	70.5%
	40	87.0%	91.8%	95.0%	96.6%	96.4%	94.3%	90.5%	85.0%	78.1%	70.0%
	50	87.0%	91.0%	93.7%	94.8%	94.3%	92.2%	88.5%	83.2%	76.7%	69.1%
	60	87.0%	90.0%	92.0%	92.7%	91.9%	89.6%	86.0%	80.9%	74.7%	67.6%
	70	87.0%	89.0%	90.1%	90.2%	89.0%	86.6%	82.9%	78.1%	72.2%	65.5%
	80	87.0%	87.9%	88.1%	87.4%	85.7%	83.0%	79.3%	74.6%	69.1%	62.8%
	90	87.0%	86.7%	85.8%	84.3%	82.1%	79.1%	75.2%	70.6%	65.3%	59.5%

The solar panels (PV and thermal), must have 90% or greater efficiency rating in the table above. If less than 90%, partial REMP credit will be given in the following manner:

100% efficient = 100% credit
90% efficient = 100% credit
89% efficient = 89/90 = 99% credit
75% efficient = 75/90 = 83% credit

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 2009 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 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 alterations and additions: Submit cut sheets for any new heating and cooling equipment. Note fuel type and combustion air requirements for existing equipment to remain.

For new construction: Submit cut sheets for any new heating and cooling equipment. Provide either a mechanical plan stamped by a mechanical engineer (see Mechanical Plan section) or provide a Manual J. Either choice must include the following:

- ☐ Heat gain/loss (must be based on insulation values matching the Energy Compliance Section)
- ☐ Winter/summer indoor/outdoor design temperatures

- Winter indoor temp may not be above 72 deg F (2009 IECC 302.1)
- Winter indoor temp may not be below 68 deg F (2009 IRC R303.8)
- Summer indoor temp may not be below 75 deg F (2009 IECC 302.1)
- Summer outdoor design temp: 81 deg F (Ordinance 31, 2011)
- Winter outdoor design temp: -15 deg F (Ordinance 31, 2011)

☐ Design air leakage rate in CFMs.
☐ HVAC equipment selection BTUs
☐ Equipment efficiency rating
☐ Kitchen Hood CFMs
☐ Dryer CFMs

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.

Construction Drawings Set

Drawing Standards

- ☐ 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.
- ☐ 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** shall be printed on the same sheet as the proposed plans. Where there is not enough room, the existing/demolition plans should be grouped 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 2009 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')
- ☐ 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. Orientation and slope must achieve 90% efficiency. 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 2009 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 2009 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 & 2009 IMC 306)
- ☐ 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 well is in walkway, provide guards or a grate that requires no more than 15lbs of force to open and permits the passage of smoke. (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)
    - o Fire resistive (and STC/IIC per Appendix K) walls, floors, ceilings, roofs, and shafts
    - o Continuity clearly shown
    - o Callouts referencing details
- ☐ Fire rated openings, doors, and windows
- ☐ Below grade ejectors, sump pumps
- ☐ Floor drains
- ☐ Electrical panel location

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 in Wildfire Zone High Hazard, Class B all others)
- ☐ 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 31, 2011, pg17) 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 31, 2011, pg13) 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. (R612.2)
- ☐ 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. (2009 IMC 401.4, 501.2)
- ☐ 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:
    - o 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.
    - o 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.
    - o Forgetting slab edge insulation. See the options below. Not needed if top of slab is 12" or more below grade. (2009 IECC 402.2.8)

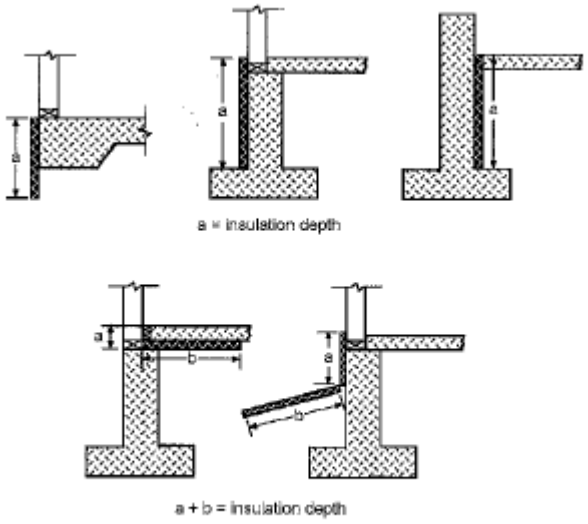

Figure 402.2.8
SLAB INSULATION METHODS

- ☐ 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)
    - o Fire resistive (and STC/IIC) walls, floors, ceilings, roofs, and shafts
    - o Extents clearly shown
    - o Callouts referencing details
- ☐ Note where fireblocking and draftstopping 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
- ☐ 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
- ☐ Air sealing locations (2009 IECC 402.4.1):
  - 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 dampproofing (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** (Additional information section below); choose one listed to UL 263 or ASTM E 119; choose one from 2009 IBC 720; or create one from 2009 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 2009 IBC 720; or create one from 2009 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 2009 IBC 720; or create one from 2009 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 gasketed doors and exterior air supply. (2009 IECC 402.4.3)
  - ☐ 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 2009 IMC)

Stamped Mechanical Plans are required for new construction if Manual J, D, S are not submitted (See Mechanical Documents section above)

- ☐ Whole house mechanical ventilation system required by Ordinance 31, 2011. Must provide a mechanical exhaust system, supply air system, or a combination to provide whole building ventilation with outdoor air.
- ☐ Show all equipment, ductwork, and venting
- ☐ Mechanical room equipment layout with working space and clearances
- ☐ Boiler or furnace size and efficiency
- ☐ Show all intake, exhaust, flue, and vent outlets
- ☐ All fireplaces, sizes, types, and venting
- ☐ Radiant floor piping
- ☐ Equipment access

Lighting Plans (under the 2011 NEC, 2009 IECC)

- ☐ Permanently installed light fixtures
- ☐ Lighting Schedule, note IC rated cans
- ☐ 50% 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.
- ☐ High efficacy lamps are defined by 2009 IECC 202 as:
    - o 60 lumens per watt for lamps over 40 watts
    - o 50 lumens per watt for lamps over 15 watts to 40 watts
    - o 40 lumens per watt for lamps 15 watts or less

Structural Plans (under the 2009 IBC)

Required for new construction, additions, and structural alterations.

- ☐ Reference to soils report or soils 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 31, 2011
- ☐ 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 2009 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 31, 2011 and Ordinance 11, 2011:

- ☐ 2009 IRC (International Residential Code) Chapters 1-10
- ☐ 2009 IRC appendixes:
  E: Manufactured homes, F: Radon, J: Existing Buildings & Structures, H: Patio Covers, K: Sound Transmission.
- ☐ 2009 IPC (International Plumbing Code)
- ☐ 2009 IMC (International Mechanical Code)
- ☐ 2009 IFGC (International Fuel Gas Code)
- ☐ 2009 IECC (International Energy Conservation Code)
- ☐ 2009 IFC (International Fire Code)
- ☐ 2011 NEC (National Electrical Code)

Design Criteria

As adopted by Ordinance 31, 2011:

- ☐ Roof snow load: 75 psf
- ☐ Ground snow load: 105 psf
- ☐ Wind speed: 90 mph (3 second gust), exposure category B
- ☐ Seismic design category: C
- ☐ Weathering: Severe
- ☐ Frost line depth: 36”
- ☐ Termite/Decay: none to slight
- ☐ Winter design temperature: -16 deg F
- ☐ Ice shield underlayment required: yes, 6’ up from eave
- ☐ Flood Hazards: FEMA MAP 6/4/1987
- ☐ Air Freezing Index: 1694
- ☐ Mean Annual Temp: 40 deg F
- ☐ Site Class: determined by soils report, or by structural engineer’s assumption statement.

Per City Policy:

- ☐ Summer outdoor design temp: 81 deg F
- ☐ Winter outdoor design temp: -15 deg F
- ☐ Indoor design relative humidity: 35%

Fire Sprinklers

As adopted by Ordinance 31, 2011:

- 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. For new construction, you must have a report for the blower door test per 2009 IECC 402.4.2.1.
3. Manuals for all appliances and equipment must be compiled together in one location for the owner.
4. A certificate must be permanently affixed on or in the electric panel with the following information per 2009 IECC 401.3:
    a. List all insulation R values and fenestration U factors.
    b. List types and efficiencies of all heating, cooling, and service water heating equipment.
5. Submit a complete set of as-built drawings for the project.