Plan submittal Energy Code compliance worksheet

to achieve effective use of Energy per 2009 IECC
Sections 402.1-402.3 for climate zone 5

Step 1. Insulation

A. Determine minimum levels of insulation required to achieve Compliance. (use table below). Write on this form these values.

B. Write on form your actual insulation R-values.

Step 2. Mandatory Construction

A. Review the mandatory requirements listed on (page 2) Check each item showing you understand that these items will be inspected for compliance .

Step 3. Air Leakage

A. Indicate your selection of either: (See page 4)

[ ] The visual inspection checklist option

[ ] Or the Air leakage Test option

Step 4. Compliance

Complete and Sign each page of this Form

Northern Nevada Climate Zone 5

Carson City **City of Fernley**
City of Reno **City of Sparks**
Douglas County **Lyon County**
Storey County **Washoe County**

Building Envelope Requirements

Window U-Factor Maximum	Skylight U-Factor Maximum	Window and Skylight SHGC	Ceiling R-Value Minimum	Wood Frame Wall R-Value	Mass Wall R-Value	Floor R-Value	Basement Wall R-Value Minimum	Slab R-Value and Depth	Crawlspace Wall R-Value Minimum Non-Ventilated Space
0.35	0.60	Not required	R-38	R-20 or 13 +5	R-13/17	R-30	R-10/13	R-10, 2ft	R-10/13

This table applies to all new construction, as well as all additions, alterations and replacement windows and is based upon the building envelope requirements for Climate Zones 5, Table 402.1.1 in the 2009 IECC. This table applies to residential buildings, as defined in the IECC, with wood framing and/or mass walls. For steel-framed buildings, refer to Section 402.2.4 of the IECC. See page 3 for explanations.

Jurisdiction: _____

Permit # _____

Checked By _____

Prescriptive Specification Worksheet

2009 International Energy Conservation Code (IECC)

Builder Name _____

Builder Address _____

Building/site Address _____

Submitted By _____

Phone Number _____

Description	Comments	Proposed R-Value		Minimum R- Value
Ceiling		R-		R-
Wall		R-		R-
Floor over Unconditioned non ventilated Space		R-		R-
Floor Over Outside Air		R-		R-
Basement Wall		R-		R-
Slab Floor		R-		R-
Crawl Space Wall		R-		R-
Mass Wall		R-		R-

U-Factor

Description	Comments	Proposed U-Value		Maximum U- Value
Glazing		U-		U-
Opaque Door		U-		U-
Skylight		U-		U-

Statement of Compliance

The proposed building design represented in these documents is consistent with the building plans, specifications, and other calculations submitted with the permit application. The proposed building design has been designed to meet the requirements of the International Energy Conservation Code.

_____ _____ _____

Building Designer Company Name Date

Verify all mandatory requirements have been met
And are documented per IECC Sections 401, 402.4, 402.5, 402.6 and 403. As amended by the 2011 Northern Nevada Amendments

☐ **Air Leakage:**
The building thermal envelope shall be durably sealed to limit infiltration. The following shall be caulked, gasketed, weatherproofed or otherwise sealed with an "air Barrier" material, suitable film, or solid material:
1.) All Joints, seam, and penetrations. 2.) Site built windows, doors and skylights. 3.) Utility penetrations.
4.) Openings between windows and door assemblies and their respective jambs and framing.
5.) Drop ceilings or chases adjacent to the thermal envelope.
6.) Knee walls 7.) Walls and ceilings separating a garage from conditioned spaces.
8.) Behind tubs and showers on exterior walls. 9.) Common walls between dwelling units. 10.) Attic access openings.
11.) Rim joist junction. 12.) All other sources of infiltration.
Duct tightness, Shall be verified by either a post construction AIR Leakage **test** Or a rough in AIR Leakage **test.** These leakage tests are performed by a licensed Nevada Real Estate Division Energy Auditor.

☐ **Materials Identification:**
Materials and equipment are identified so that compliance can be determined.
Manufacturer manuals for all installed heating and cooling equipment and service water heating equipment have been provided.
Insulation R-values and glazing U-factors are clearly marked on the building plans or specifications.
Insulation is installed according to manufacturer's instructions, in substantial contact with the surface being insulated, and in a manner that achieves the rated R-value without compressing the insulation.

☐ **Duct Insulation:**
Supply Ducts in attics shall be insulated to a minimum of R-8. All other ducts shall be insulated to a minimum R-6
Ducts inside the 'building thermal envelope' do not require insulation.

☐ **Duct Construction:**
All ducts, air handlers, filter boxes and building cavities used as ducts shall be sealed.
Joints and seams shall comply with 2011 Northern Nevada Amendments, section 403.2.2.1
Building framing cavities are not used as supply ducts.
Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

☐ **Temperature Controls:**
Programmable Thermostats exist for each separate HVAC system. The thermostat shall be Capable of controlling the heating and cooling system on a daily schedule to maintain different temperature set points at different times of day.

☐ **Heating and Cooling Equipment Sizing:**
Heating and cooling equipment shall be sized in accordance with ACCA Manual S based on building loads calculated in accordance with ACCA Manual J or other approved heating and cooling calculations methodologies.

☐ **Circulating Hot Water Systems:**
Circulating hot water pipes are insulated to R-2.
Circulating hot water systems include an automatic or accessible manual switch to turn off the circulating pump when the system is not in use.

☐ **Heating and Cooling Piping Insulation:**
HVAC piping conveying fluids above 105 degrees F or chilled fluids below 55 degrees F are insulated to R-3

☐ **Certificate:**

A permanent certificate is provided by the builder, to the owner. And to the Building Inspector. Listing the predominant ceiling-wall-floor insulation R-values; window U-factors; type and efficiency of space-conditioning and water heating equipment.

Review of mandatory items signature

_____

Clarification and definitions
of the Building Envelope Requirements
prescriptive compliance form

Building Envelope Requirement **table** explained;

"Wood frame Wall" {R-20} is insulation, installed in the wall stud cavities. A different wall insulation option is {R-13} cavity insulation with additional 'insulated sheathing' installed on the exterior with a minimum {R-5} value. This option allows a reduction of the exterior insulation R-value when structural sheathing (OSB or plywood shear) is installed on more than 25% of the walls, then the exterior 'insulated sheathing' must have a minimum R-2 value.

"Mass Wall" {R-13} is installed on the exterior of the wall. Or {R-17} if more than half of the insulation is on the interior of the mass wall.

Floor insulation may be reduced to fully filling floor joist cavity minimum R- value 0f R-19

"Basement wall" {R-10} continuous insulation or {R-13} cavity insulation on the interior of the basement wall.

"Crawl Space Wall" > An alternative to insulating floors over crawl spaces, crawl space walls shall be permitted to be insulated when the crawl space is not vented to the outside. This insulation needs to be permanently fastened to the stem wall and extend to the finished grade level and then horizontally for a minimum 24". Earth in unvented crawl space shall be covered with a Class I vapor retarder, (overlapped six inches, taped or sealed) and extending up the stem wall a minimum six inches and attached to the stem wall.

Definitions;

Air Barrier > Material(s) assembled and joined together to provide a barrier to air leakage through the building envelope. An air barrier may be a single material or a combination of materials.

U-Factor > The coefficient of heat transmission (air to air) through a building component or assembly. Used in defining 'glass window' heat energy transmission. [Thermal transmission]

R-Factor > The thermal resistance of heat flow through a material from one bounding surface to the other bounding surface. It is equal to [1/U-value]. [Thermal Resistance]

Mass Wall > Above grade walls made of; concrete block, concrete, insulated concrete form(ICF), masonry w/cavity, brick (other than veneer), earth (adobe, compressed earth block, rammed earth) and solid timber/logs.

Insulated sheathing > An insulating board with a core material having a minimum r-value of R-2. {Commonly a solid foam product}

Thermal Barrier (as found on the 'air barrier & insulation checklist') > this is the 'exterior thermal envelope **insulation**'. Do NOT confuse this with the foam plastic 'separation' requirement which is also referred to as a 'thermal Barrier'. Foam plastic must be separated from the building interior by a material that meets the 'temperature transmission fire test and integrity fire test' {NFPA 275}. {see 2006 IRC 314}.

Vapor Retarder > Class I: 0.1 perm or less

There are three possible methods that can be used to achieve compliance with the 2009 International Energy and Conservation Code (IECC).

1.) Prescriptive > Specific insulation requirements
2.) UA- alternative > a common example of this is the {www.energycodes.gov - ResCheck computer program}
3.) Performance > Simulated performance alternative, a compliance analysis utilizing annual energy cost calculations for the proposed design compared with a standard reference design, based on {2009 IECC 405}.

REFERENCES

Please Note: NNICC and the affiliated jurisdictions do not endorse the sites behind these links. They are offered for information and additional research. These links should be used for educational purposes only.

NNICC

LINK NNICC > Northern Nevada International Code Council
Site Address http://www.nnicc.org/

NNICC energy code amendments

LINK 2009 IECC code amendments (titled; 2011 Northern Nevada Energy Code Amendments)
Site Address
http://www.nnicc.org/2011%20FINAL%20ENERGY%20CODE%20AMENDMENT%2004-01-13%20Package.pdf

LINK Proposed non-energy code 2012 Northern Nevada Amendments.
Site Address
http://www.nnicc.org/2012%20CODE%20AMENDMENT%20FINAL%2002-04-13%20Package%20Final%20Document.pdf

Energy Auditors

LINK Nevada State Real Estate Division, list of Licensed Energy Auditors
Site Address
https://elicenseb.irondata.com/NVDBI/Production/OnlineWeb/Lookup/LicenseLookup.aspx {place your cursor over the first license number box, then select "EA", for energy auditor list.}

Nevada Revised Statues

LINK Nevada Revised Statues NRS 701 'Energy Code'
Site Address http://www.leg.state.nv.us/NRS/NRS-701.html

U.S. Department of Energy

www.energycodes.gov
U.S. DOE Energy Efficiency and Renewable Energy Site

2009 IECC code book online

http://publicecodes.cyberregs.com/icod/iecc/index.htm

Construction details

www.buildingscience.com
www.naima.org
www.bpi.org.

Building envelope tightness and insulation installation Requirements

You **must** select from two options to show code compliance.

Utilize the following Construction Requirements and visual inspection checklist to achieve compliance with the '2009 International Energy Conservation Code' {option IECC 402.4.2.2} as Amended by the ' 2011 Northern Nevada code amendments'.

Or You may select to use the 'Air leakage Test' option {IECC 402.4.2.1} to show code compliance, see details on the Testing page. A Nevada State Real Estate Division licensed individual is required to preform the compliance verification. The Inspector/Tester will provide a statement indicating they have found the structure to be in compliance with the 2009 IECC.

Permit # _____ Address:_____ Date _____

Licensed Energy Auditor's Name and License #. _____

Indicate your option selection: Air leakage test _____ Visual Inspection _____

Licensed Energy Auditor . **IF any component has not been installed then a PASSING "AIR LEAKAGE" test is REQUIRED**

AIR BARRIER and INSULATION CHECKLIST

	COMPONENT	CRITERIA	SITE inspection # 1			SITE inspection # 2		
			Y	N	N/A	Y	N	N/A
1	Air barrier and thermal barrier	Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with building envelope air barrier.						
		Breaks or joints in the air barrier are filled or repaired.						
		Air-permeable insulation is not used as a sealing material.						
		Air-permeable insulation is inside of an air barrier.						
2	Ceiling/attic	Air barrier in any dropped ceiling/soffit is substantially aligned with insulation and any gaps sealed.						
		Attic access (except in unvented attic), knee wall door, or drop down stair is sealed.						
3	Walls	Corners and headers are insulated.						
		Junction of foundation and sill plate is sealed.						
4	Windows Skylights, doors	Space between window/door jambs and framing is sealed.						
5	Rim Joists	Rim Joists are insulated and include an air barrier.						
6	Floors (including above garage and cantilevered floors)	Insulation shall be installed to maintain permanent contact with underside of subfloor decking. The air barrier shall be installed at any exposed edge of insulation.						
7	Crawl space walls	Insulation is permanently attached to walls.						
		Exposed earth in unvented crawl spaces is coverd with Class I vapor retarder and overlapping joints taped.						
8	Shafts, penetrations	Duct shafts, utility penetrations, knee walls, and flue shafts opening to exterior or unconditioned space are sealed.						
9	Narrow cavities	Batts in narrow cavities are cut to fit, or narrow cavities are filled by sprayed/blown insulation.						
10	Garage separation	Air sealing is provided between the garage and conditioned spaces.						
11	Recessed lighting	Recessed light fixtures are air tight, IC rated, and sealed to drywall. Exception--fixtures in conditioned space.						
12	Plumbing & wiring	Insulation is placed between outside and pipes. Batt insulation is cut to fit around wiring and plumbing, or sprayed/blown insulation extends behind piping and wiring.						
13	Shower/tub on ext. wall	Showers and tubs on exterior walls have insulation and an air barrier separating them from the exterior wall.						
14	Electrical/phone box on exterior wall	Air barrier extends behind boxes or air sealed type boxes are installed.						
15	Common wall	Air barrier is installed in common wall between dwelling units.						
16	HVAC register boots	HVAC register boots that penetrate building envelope are sealed to subfloor or drywall.						
17	Fireplace	Fireplace walls include an air barrier.						

Signature Inspection #1_____ Date_____

Signature Inspection #2 Date

 Plan submittal Review of envelope leakage items signature _____