Plan submittal Energy Code compliance worksheet

To achieve effective use of Energy per 2012 IECC
Sections R402.1-R402.4 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. **Compliance**

Complete and Sign each page of this Form.

Step 4. **Air Leakage**: Air leakage Test by energy auditor.

Step 5. Air Barrier and Insulation Installation Verification.

See page four Table R402.4.1.1

Insulation

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-

Northern Nevada Climate Zone 5

Building Envelope Requirements

Window U-Factor Maximum U value	Skylight U-Factor Maximum	Window and Skylight SHGC	Ceiling R-Value Minimum R value	Wood Frame Wall R-Value	Mass Wall R-Value	Floor R-Value	Basement Wall R-Value Minimum	Slab R-Value and Depth R value	Crawlspace Wall R-Value Minimum Non-Ventilated Space
0.32	0.55	Not required	49 38 if Raised heal	20 or 13 +5	R-13/17	R-30	R-15/19	10, 2ft Heated 15	R-15/19

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 R402.1.1 in the 2012 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 R 402.2.6 of the IECC. See page 3 for explanations. Page 1

Prescriptive Specification Worksheet

2012 International Energy Conservation Code (IECC)

Energy compliance Designer; Name _____

Contact persons; Address _____

Building/site Address _____

Submitted By _____

Phone Number _____

Email _____

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 R402.1.1- R402.1.2, R402.3, R402.4. As amended by the 2015 Northern Nevada Amendments to the 2012 IECC

☐ **Air Leakage:**
The building thermal envelope shall be constructed to limit air leakage as per table R402.4.1.1.

Testing: The building shall be tested and verified as having an air leakage rate of not more than 5 air changes per hour.

Duct tightness, Shall be verified by either a post construction AIR Leakage test **max 6 cfm** , Or a rough in AIR Leakage test **max 6 cfm** These leakage tests are performed by a licensed Nevada Real Estate Division Energy Auditor.{R403.2.2-amended}

Materials Identification:

1) Materials and equipment are identified so that compliance can be determined.
2) Manufacturer manuals for all installed heating and cooling equipment and service water heating equipment have been provided.
3) Insulation R-values and glazing U-factors are clearly marked on the building plans or specifications.
4) 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.
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-3.
Circulating hot water systems include an automatic or accessible manual switch to turn off the circulating pump when the system is not in use.
Non-circulating hot water piping insulated to R-3:
¾" diameter if > 10' length, ½" diameter if > 20'
Kitchen supply piping insulate min R-3

☐ **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

☐ **Lighting:** 75% 0f lamps to be high efficacy lamps.
House mechanical ventilation system is required as follows.

Provide Mechanical ventilation that meets the requirements of the following; The mechanical ventilation rate shall provide **outdoor air** as calculated using the following formula;$[(0.01) \times CFA + (7.5) \times (N_{br} + 1)]$ where : CFA = conditioned floor area, N_{br} = number of bedrooms, or the minimum outdoor air ventilation rate may be achieved by using 2012 IRC table M1507.3.3(1) or other approved means of ventilation using ASHRAE 62.2-2013. The mechanical system shall have a readily accessible on-off control switch allowing control of the mechanical system. Utilization of outside air temperature sensors, carbon dioxide sensors, humidity sensors, motion sensors or similar interment controls to activate the outside air mechanical equipment is permitted. The Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not working.

☐ **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 40% of the walls, then the exterior 'insulated sheathing' must have a minimum R-3 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-15} continuous insulation or {R-19} 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 . 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 2012 IRC 316}.

Vapor Retarder > Class I: 0.1 perm or less

There are Four possible methods that can be used to achieve compliance with the 2012 International Energy and Conservation Code (IECC).

1.) **Prescriptive** > Specific insulation requirements {this form}
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 {2012 IECC R405}.
4.) **Energy Rating Index Compliance Alternative** {see 2012 energy amendments}

REFERENCES

Please Note: NNICC does 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 CouncilSite Address
http://www.nnicc.org/ **NNICC energy code amendments**

LINK to the 2012 Energy code amendments
https://www.washoecounty.us/building/Files/Files/2015%20Northern%20Nevada%20Energy%20Code%20Amendments.pdf
Site Address

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
2012 IECC code adoption
https://www.leg.state.nv.us/register/2013Register/R126-13A.pdf

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.

2012 IECC

TABLE 402.4.1.1

COMPONENT	CRITERIA	
Air Barrier and Thermal barrier	A Continuous air barrier shall be installed in the building envelope. Exterior thermal envelope contains a continuous air barrier. Breaks or joints in air barrier shall be sealed. Air-permeable insulation shall not be used as a sealing material.	
Ceiling/Attic	The air barrier in any dropped ceiling/soffit shall be aligned with the insulation and any gaps in the air barrier sealed. Access openings, drop down stairs or knee wall doors to unconditioned attic space shall be sealed.	
Walls	Corners and headers shall be insulated and the junction of the foundation and sill plate shall be sealed. The Junction of the top plate and exterior walls shall be sealed. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier. Knee walls shall be sealed.	
Windows, skylights and doors	The space between window/door jambs and framing and skylights and framing shall be sealed.	
Rim Joists	Rim joists shall be insulated and include the air barrier.	
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.	
Crawl space walls	Where provided in lieu of floor insulation, insulation shall be permanently attached to the crawlspace walls. Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped.	
Shafts, penetrations	Duct shafts, utility penetrations, and flue shafts opening to exterior or unconditioned space shall be sealed.	
Narrow cavities	Batts in narrow cavities shall be cut to fit, or narrow cavities shall be filled by insulation that on installation readily conforms to the available cavity space.	
Garage separation	Air sealing shall be provided between the garage and conditioned spaces.	
Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall be air tight, IC rated, and sealed to the drywall.	
Plumbing and wiring	Batt insulation shall be cut neatly to fit around wiring and plumbing in exterior walls, or insulation that on installation readily conforms to available space shall extend behind piping and wiring.	
Shower/tub on exterior wall	Exterior walls adjacent to showers and tubs shall be insulated and the air barrier installed separating them from the showers and tubs.	
Electrical/phone box on exterior walls	The air barrier shall be installed behind electrical or communication boxes or air sealed boxes shall be installed.	
HVAC register boots	HVAC register boots that penetrate building thermal envelope shall be sealed to the sub-floor or drywall.	
Fireplace	An air barrier shall be installed on fireplace walls. Fireplaces shall have gasketed doors.	