2011 NORTHERN NEVADA

AMENDMENTS

2009 INTERNATIONAL ENERGY CONSERVATION CODE

2006 INTERNATIONAL RESIDENTIAL CODE (ENERGY PROVISIONS)

Published by the Northern Nevada Chapter of the International Code Council:
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PREFACE

This document comprises the Northern Nevada Amendments to the following codes:

2009 International Energy Conservation Code as published by the International Code Council.

Chapter 11 of the 2006 International Residential Code as published by the International Code Council.

It was created by the organizations listed on the cover page with the support of the Northern Nevada Chapter of the International Code Council as a document to be adopted by reference. These provisions are not code unless adopted and codified by governmental jurisdictions. This document is available to be adopted as code by any jurisdiction without permission or approval from the organizations listed.

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Note: Deleted language has been ~~stricken through~~.
Added language has been underlined.

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Section 101.4.3 Additions, alterations, renovations or repairs.

Add the following exception to section 101.4.3:

9. Relocations only of existing luminaries within an existing area enclosed by walls or floor to ceiling partitions.

Section 202 Definitions.

Amend section 202 to include the following definitions:

VAPOR RETARDER CLASS. A measure of a material or assembly's ability to limit the amount of moisture that passes through that material or assembly. Vapor retarder class shall be defined using the desiccant method of ASTME 96 as follows:
Class I: 0.1 perm or less.
Class II: 0.1 < perm ≤ 1.0 perm.
Class III: 1.0 < perm ≤ 10 perm.

Section 303.1.3 Fenestration product rating.

Amend section 303.1.3 to read as follows:

U-factors of fenestration products (windows, doors and skylights) shall be determined in accordance with NFRC 100 by an accredited, independent laboratory, and labeled and certified by the manufacturer. Products lacking such a labeled *U*-factor shall be assigned a default *U*-factor from Tables 303.1.3(1) or 303.1.3(2) or ASHRAE 90.1 Tables A-8.1 A and B or Table 8.2. The solar heat gain coefficient (SHGC) of glazed fenestration products (windows, glazed doors and skylights) shall be determined in accordance with NFRC 200 by an accredited, independent laboratory, and labeled and certified by the manufacturer. Products lacking such a labeled SHGC shall be assigned a default SHGC from Table 303.1.3(3) or from ASHRAE 90.1 Tables A-8.1 A and B or Table 8.2.

Section 303.1.3.1 Fenestration rating documentation.

Add the following subsection to Section 303.1.3.1:

303.1.3.2 Construction site rating documentation. When required by the building official the following documentation shall be provided at the construction site prior to inspection of the thermal energy envelope:

1. All NFRC certified factory-built fenestration products shall be labeled with the NFRC certification label. This label is to remain intact on the fenestration unit until inspected by the jurisdiction having authority.

2. For rated site-built fenestration products, there shall be a separate NFRC label certificate for each type of fenestration product used in the project, signed by an independent, NFRC certified inspection agency. The label will display the following information:
   a) The NFRC certification logo.
   b) The name, address and authorized NFRC license number of the approved inspection agency.
   c) The product ratings (U-factor, solar heat gain coefficient and visible light transmittance).
   d) The name, address, and permit number of the project.
   e) The product line information.
   f) The names and addresses for the suppliers of the frame, the glazing and the contractor.
   g) The printed name and signature of the inspector for the certified inspection agency.

3. For site-built fenestration products where default values were listed on the approved plans, the glazing contractor of record will provide the jurisdiction, a letter on company stationary, containing the following information:
   a) The name, address and permit number of the project.
   b) An itemized list of documentation describing specific components used to construct each type of fenestration.
   c) The signature of the owner or owner's agent of the glazing company, attesting to the fact that all products described and documentation submitted were used on that jobsite.

Section 303.1.3.2 Construction site rating documentation.

Add the following subsection to Section 303.1.3.1:

303.1.3.2 Construction site rating documentation. When required by the building official the following documentation shall be provided at the construction site prior to inspection of the thermal energy envelope:

1. All NFRC certified factory-built fenestration products shall be labeled with the NFRC certification label. This label is to remain intact on the fenestration unit until inspected by the jurisdiction having authority.

2. For rated site-built fenestration products, there shall be a separate NFRC label certificate for each type of fenestration product used in the project, signed by an independent, NFRC certified inspection agency. The label will display the following information:

a) The NFRC certification logo.
b) The name, address and authorized NFRC license number of the approved inspection agency.
c) The product ratings (U-factor, solar heat gain coefficient and visible light transmittance).
d) The name, address, and permit number of the project.
e) The product line information.
f) The names and addresses for the suppliers of the frame, the glazing and the contractor.
g) The printed name and signature of the inspector for the certified inspection agency.

3. For site-built fenestration products where default values were listed on the approved plans, the glazing contractor of record will provide the jurisdiction, a letter on company stationary, containing the following information:
   a) The name, address and permit number of the project.
   b) An itemized list of documentation describing specific components used to construct each type of fenestration.
   c) The signature of the owner or owner's agent of the glazing company, attesting to the fact that all products described and documentation submitted were used on that jobsite.

Section 401.3 Certificate.

Amend section 401.3 to read as follows:

401.3 Certificate. ~~A permanent~~ The builder shall provide to the owner a certificate ~~shall be posted on or near the electrical distribution panel~~ approved by the jurisdiction. ~~The certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels.~~ The certificate shall be completed by the builder or registered design professional. The certificate shall list the predominant *R*-values of insulation installed in or on ceiling/roof, walls, foundation (slab, *basement wall*, crawlspace wall and/or floor) and ducts outside conditioned spaces and *U*-factors for fenestration. Where there is more than one value for each component, the certificate shall list the value covering the largest area. The certificate shall list the types and efficiencies of heating, cooling and service water heating equipment. ~~Where a gas-fired unvented room heater, electric furnace, or baseboard electric heater is installed in the residence, the certificate shall list "gas-fired unvented room heater," "electric furnace" or "baseboard electric heater," as appropriate. An efficiency shall not be listed for gas-fired unvented room heaters, electric furnaces or electric baseboard heaters.~~

Table 402.1.1 Insulation and Fenestration Requirements by Component.

Amend table 402.1.1 to read as follows:

TABLE 402.1.1
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE	FENESTRATION *U*-FACTOR[b]	SKYLIGHT[b] *U*-FACTOR	GLAZED FENESTRATION SHGC[b, e]	CEILING *R*-VALUE	WOOD FRAME WALL *R*-VALUE	MASS WALL *R*-VALUE[i]	FLOOR *R*-VALUE	BASEMENT[c] WALL *R*-VALUE	SLAB[d] *R*-VALUE & DEPTH	CRAWL SPACE[c] WALL *R*-VALUE
1	1.20	0.75	0.30	30	13	3 / 4	13	0	0	0
2	0.65j	0.75	0.30	30	13	4 / 6	13	0	0	0
3	0.50j	0.60	0.30	30	13	5 / 8	19	5/13[f]	0	5/13
4 except Marine	0.35	0.60	NR	38	13	5 / 10	19	10/13	10, 2 ft	10/13
5 and Marine 4	0.35	0.60	NR	38	~~20~~ 19or 13+5[h]	13 / 17	30[g]	10/13	10, 2ft	10/13
6	0.35	0.60	NR≥	49	~~20~~ 19or 13+5[h]	15 / 19	30[g]	15/19	10, 4ft	10/13
7 and 8	0.35	0.60	NR	49	21	19 / 21	38[g]	15/19	10, 4ft	10/13

Table 402.1.3 Equivalent U-Factors.

Amend table 402.1.3 to read as follows:

TABLE 402.1.3
EQUIVALENT U-FACTORS[a]

Climate Zone	Fenestration U-Factor	Skylight U-Factor	Ceiling U-Factor	Frame Wall U-Factor	Mass Wall U-Factor[b]	Floor U-Factor	Basement Wall U-Factor	Crawl Space Wall U-Factor
1	1.20	0.75	0.035	0.082	0.197	0.064	0.360	0.477
2	0.75	0.75	0.035	0.082	0.165	0.064	0.360	0.477
3	0.65	0.65	0.035	0.082	0.141	0.047	0.360	0.136
4 except Marine	0.40	0.60	0.030	0.082	0.141	0.047	0.059	0.065
5 and Marine 4	0.35	0.60	0.030	~~0.057~~ 0.060	0.082	0.033	0.059	0.065
6	0.35	0.60	0.026	~~0.057~~ 0.060	0.060	0.033	0.050	0.065
7 and 8	0.35	0.60	0.026	0.057	0.057	0.033	0.050	0.065

a. Nonfenestration *U*-factors shall be obtained from measurement, calculation or an approved source.
b. When more than half the insulation is on the interior, the mass wall *U*-factors shall be a maximum of 0.17 in Zone 1, 0.14 in Zone 2, 0.12 in Zone 3, 0.10 in Zone 4 except Marine, and the same as the frame wall *U*-factor in Marine Zone 4 and Zones 5 through 8.
c. Basement wall *U*-factor of 0.360 in warm-humid locations as defined by Figure 301.1 and Table 301.2.

Section 402.2.2 Ceilings without attic spaces.

Amend section 402.2.2 to read as follows:

402.2.2 Ceilings without attic spaces. Where Section 402.1.1 would require insulation levels above R-30 and the design of the roof/ceiling assembly does not allow sufficient space for the required insulation, the minimum required insulation for such roof/ceiling assemblies shall be R-30. This reduction of insulation from the requirements of Section 402.1.1 shall be limited to 500 square feet (46 m2) ~~or 20% of the total insulated ceiling area, which ever is less.~~ This reduction shall not apply to the U-factor alternative approach in Section 402.1.3 and the total UA alternative in Section 402.1.4

Section 402.2.9 Crawl space walls.

Amend section 402.2.9 to read as follows:

402.2.9 Crawl space walls. As 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. Crawl space wall insulation shall be permanently fastened to the wall and extend downward from the floor to the finished grade level and then vertically and/or horizontally for at least an additional 24 inches (610 mm). Exposed earth in unvented crawl space foundations shall be covered with a continuous Class I vapor retarder ~~in accordance with the International Building Code~~. All joints of the vapor retarder shall overlap by 6 inches (153 mm) and be sealed or taped. The edges of the vapor retarder shall extend at least 6 inches (153 mm) up the stem wall and shall be attached to the stem wall.

Section 403.2.2 Sealing (Mandatory).

Amend section 403.2.2 to read as follows:

403.2.2 Sealing (Mandatory). All ducts, air handlers, filter boxes and building cavities used as ducts shall be sealed. Joints and seams shall comply with Section <u>403.2.2.1</u> ~~M1601.4.1 of the International Residential Code.~~

Duct tightness shall be verified by either of the following:

1. Post construction test: Leakage to outdoors shall be less than or equal to 8 cfm (226.5 L/min) per 100 ft² (9.29 m²) of *conditioned floor area* or a total leakage less than or equal to 12 cfm (12 L/min) per 100 ft² (9.29 m²) of *conditioned floor area* when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.

2. Rough-in test: Total leakage shall be less than or equal to 6 cfm (169.9 L/min) per 100 ft² (9.29 m²) of *conditioned floor area* when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the roughed in system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to 4 cfm (113.3 L/min) per 100 ft² (9.29 m²) of *conditioned floor area*.

Exceptions: Duct tightness test is not required if the air handler and all ducts are located within *conditioned space*.

Section 403.2.2.1 Joints and seams.

Add the following subsection to Section R403.2.2:

403.2.2.1 Joints and seams. Joints of *duct systems* shall be made substantially airtight by means of tapes, mastics, liquid sealants, gasketing or other *approved* closure systems. Closure systems used with rigid fibrous glass ducts shall comply with UL181A and shall be marked 181A-P for pressure-sensitive tape, 181A-M for mastic or 181 A-H for heat-sensitive tape. Closure systems used with flexible air ducts and flexible air connectors shall comply with UL 181B and shall be marked 181B-FX for pressure-sensitive tape or 181B-M for mastic. Duct connections to flanges of air distribution system *equipment* or sheet metal fittings shall be mechanically fastened. Mechanical fasteners for use with flexible nonmetallic air ducts shall comply with UL 181B and shall be marked 181B-C. Crimp joints for round metal ducts shall have a contact lap of at least 1½ inches (38 mm) and shall be mechanically fastened by means of at least three sheet-metal screws or rivets equally spaced around the joint. Closure systems used to seal metal ductwork shall be installed in accordance with the manufacturer' installation instructions. Joints between plastic ducts and plastic fittings shall be made in accordance with the manufacturer's installation instructions.

Exceptions:

1. Spray polyurethane foam shall be permitted to be applied without additional joint seals.
2. Where a duct connection is made that is partially inaccessible, three screws or rivets shall be equally spaced on the exposed portion of the joint so as to prevent a hinge effect.
3. Continuously welded and locking type longitudinal joints and seams in ducts operating at static pressures less than 2 inches of water column (500 Pa) pressure classification shall not require additional closure systems.

Section 403.6 Equipment sizing (Mandatory).

Amend section 403.6 to read as follows:

403.6 Equipment sizing (Mandatory). Heating and cooling equipment shall be sized in accordance with ~~Section M1401.3 of the International Residential Code~~ ACCA manual S based on building loads calculated in accordance with ACCA Manual J or other approved heating and cooling calculations methodoligies.

Section 405.6.1 Minimum capabilities.

Amend section 405.6.1 to read as follows:

405.6.1 Minimum capabilities. Calculation procedures used to comply with this section shall be software tools capable of calculating the annual energy consumption of all building elements that differ between the *standard reference design* and the *proposed design* and shall include the following capabilities:

1. Computer generation of the *standard reference design* using only the input for the *proposed design*. The calculation procedure shall not allow the user to directly modify the building component characteristics of the *standard reference design*.

2. Calculation of whole-building (as a single *zone*) sizing for the heating and cooling equipment in the *standard reference design* residence in accordance with ~~Section M1401.3 of the International Residential Code~~ ACCA Manual S based on building loads calculated in accordance with ACCA Manual J or other approved heating and cooling calculation methodologies.

3. Calculations that account for the effects of indoor and outdoor temperatures and part-load ratios on the performance of heating, ventilating and air-conditioning equipment based on climate and equipment sizing.

4. Printed *code official* inspection checklist listing each of the *proposed design* component characteristics from Table 405.5.2(1) determined by the analysis to provide compliance, along with their respective performance ratings (e.g., *R*-value, *U*-factor, SHGC, HSPF, AFUE, SEER, EF, etc.).

Section 503.2.5.1 Demand controlled ventilation.

Amend section 503.2.5.1 to read as follows:

503.2.5.1 Demand controlled ventilation. Demand control ventilation (DCV) is required for spaces larger than 500 ft² (50m²) and with an average occupant load of 40 people per 1000 ft² (93 m²) of floor area (as established in ~~Table 403.3 of~~ the ~~International~~ *Mechanical Code*) and served by systems with one or more of the following:

1. An air-side economizer;

2. Automatic modulating control of the outdoor air damper; or

3. A design outdoor airflow greater than 3,000 cfm (1400 L/s).

Exceptions:

1. Systems with energy recovery complying with Section 503.2.6.

2. Multiple-zone systems without direct digital control of individual zones communicating with a central control panel.

3. System with a design outdoor airflow less than 1,200 cfm (600 L/s).

4. Spaces where the supply airflow rate minus any makeup or outgoing transfer air requirement is less than 1,200 cfm (600 L/s).

Section 503.2.7 Duct and plenum insulation and sealing

Amend section 503.2.7 to read as follows:

503.2.7 Duct and plenum insulation and sealing. All supply and return air ducts and plenums shall be insulated with a minimum of R-5 insulation when located in unconditioned spaces and a minimum of R-8 insulation when located outside the building. When located within a building envelope assembly, the duct or plenum shall be separated from the building exterior or unconditioned or exempt spaces by a minimum of R-8 insulation.

Exceptions:

1. When located within equipment.

2. When the design temperature difference between the interior and exterior of the duct or plenum does not exceed 15°F (8°C).

All ducts, air handlers and filter boxes shall be sealed. ~~Joints and seams shall comply with Section 603.9 of the International Mechanical Code.~~ All longitudinal and transverse joints, seams and connections in metallic and nonmetallic ducts shall be constructed as specified in SMACNA *HVAC Duct Construction Standards—Metal and Flexible* and NAIMA *Fibrous Glass Duct Construction Standards*. All joints, longitudinal and transverse seams and connections in ductwork shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus-embedded-fabric systems, liquid sealants or tapes. Closure systems used to seal ductwork *listed* and *labeled* in accordance with UL 181A shall be marked "181A-P" for pressure-sensitive tape, "181 A-M" for mastic or

"181 A-H" for heat-sensitive tape. Closure systems used to seal flexible air ducts and flexible air connectors shall comply with UL 181B and shall be marked "181B-FX" for pressure-sensitive tape or "181B-M" for mastic. Duct connection to flanges of air distribution system *equipment* shall be sealed and mechanically fastened. Mechanical fasteners for use with flexible nonmetallic air ducts shall comply with UL 181B and shall be marked "181B-C." Closure systems used to seal metal ductwork shall be installed in accordance with the manufacturer's installation instructions. Unlisted duct tape is not permitted as a sealant on any metal ducts.

Exception: Continuously welded and locking-type longitudinal joints and seams in ducts operating at static pressures less than 2 inches of water column (500 Pa) pressure classification shall not require additional closure systems.

Section 505.2.1 Interior lighting controls.

Add the following exception to section 505.2.1:

505.2.1 Interior lighting controls. Each area enclosed by walls or floor-to-ceiling partitions shall have at least one manual control for the lighting serving that area. The required controls shall be located within the area served by the controls or be a remote switch that identifies the lights served and indicates their status.

Exceptions:

1. Areas designated as security or emergency areas that must be continuously lighted.

2. Lighting in stairways or corridors that are elements of the means of egress.

3. Normally unoccupied areas, such as restrooms, janitor closets, storage closets and similar spaces controlled by local occupancy sensors.

Section 505.2.2 Additional controls.

Amend Section 505.2.2 to read as follows:

505.2.2 Additional controls. Each area that is required to have a manual control shall have additional controls that meet the requirements of Sections 505.2.2.1, 505.2.2.2 and 505.2.2.3.

Section 505.2.2.3 Daylight zone control.

Add two exceptions to Section 505.2.2.3:

505.2.2.3 Daylight zone control. Daylight zones, as defined by this code, shall be provided with individual controls that control the lights independent of general area lighting. Contiguous daylight zones adjacent to vertical fenestration are allowed to be controlled by a single controlling device provided that they do not include zones facing more than two adjacent cardinal orientations (i.e., north, east, south, west). Daylight zones under skylights more than 15 feet (4572 mm) from the perimeter shall be controlled separately from daylight zones adjacent to vertical fenestration.

Exceptions:

1. Daylight spaces enclosed by walls or ceiling height partitions and containing two or fewer light fixtures are not required to have a separate switch for general area lighting.

2. Where automatic dimming controls are provided for the electric lighting within the daylight zones, no separate manual control for the daylight zone shall be required.

3. In areas where daylight zones overlap, only one control shall be required to control both zones, unless the areas include more than two adjacent cardinal orientations.

Section 505.5.1 total connected interior lighting power.

Amend Section 505.5.1 exception 7 and add new exception:

505.5.1 Total connected interior lighting power. The total connected interior lighting power (watts) shall be the sum of the watts of all interior lighting equipment as determined in accordance with Sections 505.5.1.1 through 505.5.1.4.

Exceptions:
1. The connected power associated with the following lighting equipment is not included in calculating total connected lighting power.

1.1. Professional sports arena playing field lighting.

1.2. *Sleeping unit* lighting in hotels, motels, boarding houses or similar buildings.

1.3. Emergency lighting automatically off during normal building operation.

1.4. Lighting in spaces specifically designed for use by occupants with special lighting needs including the visually impaired visual impairment and other medical and age-related issues.

1.5. Lighting in interior spaces that have been specifically designated as a registered interior historic landmark.

1.6. Casino gaming areas.

2. Lighting equipment used for the following shall be exempt provided that it is in addition to general lighting and is controlled by an independent control device:

2.1. Task lighting for medical and dental purposes.

2.2. Display lighting for exhibits in galleries, museums and monuments.

3. Lighting for theatrical purposes, including performance, stage, film production and video production.

4. Lighting for photographic processes.

5. Lighting integral to equipment or instrumentation and is installed by the manufacturer.

6. Task lighting for plant growth or maintenance.

7. Advertising signage or directional signage, including sinage for business identification or promotion, location maps and directories and sports scoreboards.

8. In restaurant buildings and areas, lighting for food warming or integral to food preparation equipment.

9. Lighting equipment that is for sale.

10. Lighting demonstration equipment in lighting education facilities.

11. Lighting *approved* because of safety or emergency considerations, inclusive of exit lights.

12. Lighting integral to both open and glass enclosed refrigerator and freezer cases.

13. Lighting in retail display windows, provided the display area is enclosed by ceiling-height partitions.

14. Furniture mounted supplemental task lighting that is controlled by automatic shutoff.

15. Theme elements in theme/amusement parks and casinos.

Section 505.6.2 Exterior building lighting power.

Amend Section 505.6.2 to read as follows:

505.6.2 Exterior building lighting power. The total exterior lighting power allowance for all exterior building applications is the sum of the base site allowance plus the individual allowances for areas that are to be illuminated and are permitted in Table 505.6.2(2) for the applicable lighting *zone*. Tradeoffs are allowed only among exterior

lighting applications listed in Table 505.6.2(2), Tradable Surfaces section. The lighting zone for the building exterior is determined from Table 505.6.2(1) unless otherwise specified by the local jurisdiction. Exterior lighting for all applications (except those included in the exceptions to Section 505.6.2) shall comply with the requirements of Section 505.6.1.

Exceptions: Lighting used for the following exterior applications is exempt when equipped with a control device independent of the control of the nonexempt lighting:

1. Specialized signal, directional and marker lighting associated with transportation;

2. Advertising signage or directional signage, including sinage for business identification and promotion, location maps and directories and sports scoreboards;

3. Integral to equipment or instrumentation and is installed by its manufacturer;

4. Theatrical purposes, including performance, stage, film production and video production;

5. Athletic playing areas;

6. Temporary lighting;

7. Industrial production, material handling, transportation sites and associated storage areas;

8. Theme elements in theme/amusement parks and casinos; and

9. Used to highlight features of public monuments and registered historic landmark structures or buildings.

Chapter 6 Referenced Standards

Revise the reference standards in Chapter 6 to include the organization ACCA (Air Conditioning Contractors of America) as follows:

ACCA Air Conditioning Contractors of America
2800 Shirlington Road, Suite 300
Arlington, VA 22206

Standard reference number	Title	Referenced in code section number
Manual D-95	Residential Duct Systems	
Manual J-02	Residential Load Calculations Eight Edition	403.6
Manual S	Residential Equipment Selection	

2006 International Residential Code (Energy Provisions)

Chapter 11 Energy Efficiency

Revise chapter 11:

Delete Chapter 11 in its entirety.