

Nevada Housing Division Bond Program Minimum Energy Efficiency Requirements and Quality Assurance Measures

New Construction General Building Performance

- Energy performance equal to or greater than the EPA Energy Star Home program, Verified by an analysis of the building plans pre-construction using REM/Rate or an equivalent software; and verified by inspection and testing post construction using the Division's sampling protocol.
- Using all applicable prescriptive measures listed for mechanical system and building envelope efficiencies will result in the structure meeting the energy efficiency requirements. When the detailed analysis of the building and individual units using the REM method or an equivalent method demonstrates that the energy performance meets the Energy Star level, trade-offs with components may be made and all prescriptive measures may not be required.
- High rise projects will be modeled and analyzed using ASHRAE 90.1-2004, Appendix G.

Mechanical Systems

Heating and cooling equipment must be sized using ACCA's Manual J or equivalent protocol. Heating systems and hot water heaters must be fueled by natural gas if available. For areas not served by natural gas consult NHD.

Heating A furnace inside conditioned space will be a sealed-combustion unit.

Cooling Thermostatic expansion valves required.

EQUIPMENT	NORTHERN NEVADA	SOUTHERN
Conventional Forced Air Furnace	90 AFUE	90 AFUE
Split System Central A/C and Air source heat pumps up to 135,000 Btuh	13 SEER	13 SEER or 8.0 HSPF or 11 EER
Combination Space Heating/Water Heater	79% Recovery Efficiency 0.61 Energy Factor	79 % Recovery Efficiency 0.61 Energy Factor
Water Heater Only	0.61 Energy Factor Or 0.58 Energy Factor with R 12 blanket	0.61 Energy Factor Or 0.58 Energy Factor with R 12 blanket

Duct Leakage

Leakage to outside conditioned space of complete HVAC system and ducts 6cfm or less/100 square feet. of living space.

Living Unit Size	Maximum HVAC Leakage Allowed Outside Conditioned Space
700 sq ft	42 cfm
800 sq ft	48 cfm
900 sq ft	54 cfm
1000 sq ft	60 cfm

Ventilation

At least 15 CFM of fresh air per occupant must be provided with a ventilation system. The number of occupants will be calculated as the number of bedrooms plus one (# bedrooms + 1). Operable windows do NOT qualify as a fresh air ventilation system.

Return Air

Transfer grills or jump ducts that provide a return air path at bedrooms in units with 2 or more bedrooms unless served by return balancing air duct or if pressure difference with door closed and air handler running is 3 pascals or less.

Hot Water

Water heaters inside conditioned space of the dwelling unit will be power vented or direct-power vented unit.

Ceiling Fans

Reversible ceiling fans in all dwelling units

Prescriptive Building Envelope Efficiency Minimums

Efficiency must be equal to or greater than required minimums, unless the energy use analysis demonstrates that the building and individual unit energy performance is equal to or greater than the EPA Energy Star Home program.

COMPONENT	NORTHERN NEVADA, LAKE TAHOE, RURAL NEVADA	SOUTHERN NEVADA
ATTIC /CEILING	R38	R30
WALLS	R19/ R21 in Lake Tahoe	R15
BAND JOISTS	R19/ R21 in Lake Tahoe	R15
FLOORS OVER CRAWL SPACES	R-30	R15

SLAB FOUNDATIONS	R10 Perimeter Insulation	0
WINDOWS	U-Factor 0.36 SHGC 0.35	U Factor 0.36 SHGC 0.35
AIR INFILTRATION	Maximum 0.35 average natural air changes/hour. Complete the ENERGY STAR Thermal Bypass Inspection List.	Maximum 0.35 average natural air changes/hour. Complete the ENERGY STAR Thermal Bypass Inspection List.

DEFINITIONS

ACCA – Air Conditioning Contractors of America, www.acca.org

AFUE - Annual Fuel Utilization Efficiency

EER – Energy Efficiency Ratio

Energy Factor – (EF) for water heaters may be found at www.gamanet.org. A water heater with an EF of 0.58 with an insulating blanket of R12 also meets the requirement.

GAMA – Gas Appliance Manufacturers of America, the web site www.gamanet.org.

The web site can be used to find heating system AFUEs, Water heater EFs and Recovery Efficiency by each manufacturer.

HSPF – Heating Seasonal Performance Factor

Manual J – Residential load calculation manual that is the HVAC industry standard for determining room by room loads that is the basis for system design.

Recovery Efficiency – For combination systems that use the water heater to also provide heat, the recovery efficiency of the water heater is also the “Combined Appliance AFUE”, and is used for the AFUE of the heating side of the system.

SEER - Seasonal Energy Efficiency Rating

Lights

Light Fixtures Energy Star Lamps

Appliances

Refrigerators Energy Star labeled

Dishwashers Energy Star labeled

Clothes Washers Energy Star labeled

Hot Water Conservation

Showerheads Use 2.5 gallons per minute or less

Faucets Use 2.0 gallons per minute or less

Quality Assurance

During project construction, each unit type (i.e., floor plan and location in building) will be inspected and tested as a quality assurance measure until two consecutive units of this model type meet testing requirements. At this point, testing on this unit type can be reduced to a minimum sampling rate of 15%.

Mechanical Systems

- Verify all systems for proper installation and operation
- Test air leakage of individual HVAC units
- Verify installation of thermostatic expansion valve in A/C units

Heating Proper installation will be verified

Cooling Thermostatic Expansion Valve verified

Duct Leakage Verified by pressure testing

Ventilation Verified by testing and inspection

Return Air
Balancing Verified by inspection

Hot Water Verified by inspection

Building Envelope

- Complete the ENERGY STAR Thermal Bypass Inspection Checklist
- Ensure insulation is at required levels, is installed properly and consistently
- Document NFRC rating on windows for required U-value and SHGC.
- Ensure that Low E coatings on windows are installed on the correct surface
- Test air leakage of building envelope at individual units

Attics Verified by inspection during construction

Walls Verified by inspection during construction

Band joists Verified by inspection during construction

Crawl Space
Foundations Verified by inspection during construction

Slab Foundations Verified by inspection during construction

Windows Verified by inspection during construction

Infiltration Verified post construction by pressure test

Appliances

Refrigerators Verified by inspection post construction

Dishwashers Verified by inspection post construction

Clothes Washers Verified by inspection post construction

Hot Water Conservation

Showerheads Verified by inspection post construction

Faucets Verified by inspection post construction