

# Las Cruces Residential Stretch Code

Code Language:

*Add new appendix as follows:*

## **APPENDIX RG LAS CRUCES GREEN STRETCH CODE**

### **SECTION RG101**

**RG101.1 General.** Existing residential buildings shall comply with Chapter 5. New residential buildings shall comply with Sections RG103 through RG104.

### **SECTION RG102** **GENERAL DEFINITIONS**

**ALL-ELECTRIC BUILDING.** *A building that contains no combustion equipment, or plumbing for combustion equipment, installed within the building, or building site.*

**APPLIANCE.** *A device or apparatus that is manufactured and designed to utilize energy and for which this code provides specific requirements.*

**COMBUSTION EQUIPMENT.** *Any equipment or appliance used for space heating, service water heating, cooking, clothes drying, or lighting that uses fuel gas or fuel oil.*

**EQUIPMENT.** *Piping, ducts, vents, control devices and other components of systems other than appliances that are permanently installed and integrated to provide control of environmental conditions for buildings. This definition shall also include other systems specifically regulated in this code.*

**SOLAR-READY ZONE.** *A section or sections of the roof or building overhang designated and reserved for the future installation of a solar photovoltaic or solar thermal system.*

### **SECTION RG103** **ALL-ELECTRIC BUILDINGS**

**RG103.1 All-electric building.** *Projects shall comply with Section R401.2 and shall be all-electric buildings.*

**RG103.1.1 Space heating.** *New and replacement equipment providing space heating shall be electric heat pump equipment. New electric resistance equipment shall only be permitted as supplementary heat for a heat pump space heating system controlled in accordance with C403.4.1.1.*

**SECTION RG104 DEPARTMENT OF ENERGY ZERO ENERGY READY HOME**

**RG104.1 Scope.** This section establishes criteria for compliance with the Department of Energy Zero Energy Ready Home Standard.

**RG104.2 Compliance.** Buildings shall comply with Section RG104.3 or Section RG104.4.

**RG104.3 Department of Energy Zero Energy Ready Home Certification.** Buildings shall certify as a Department of Energy Zero Energy Ready Home.

**RG104.3.1 Documentation.** Documentation verifying that the building is certified as a Department of Energy Zero Energy Ready Home shall be provided to the *code official*.

**RG104.4 Prescriptive Requirements.** Buildings shall comply with Sections RG104.4.1 through RG104.4.12.

**RG104.4.1 Efficient Heat Pump.** The heating and cooling equipment shall be an ENERGY STAR air source heat pump with an efficiency greater than or equal to 9.2HSPF/16 SEER.

**RG104.4.2 Insulation and fenestration criteria.** The building thermal envelope shall meet the requirements of Table RG104.4.2. Fenestration shall have a U-factor and glazed fenestration SHGC equal to or less than that specified in Table RG104.4.2. Assemblies shall have an R-value equal to or greater than that specified in Table RG104.4.2.

**TABLE RG104.4.2  
INSULATION MINIMUM R-VALUES AND FENESTRATION REQUIREMENTS BY COMPONENT<sup>a</sup>**

<u>FENESTRATION U-FACTOR<sup>b,h</sup></u>	<u>SKYLIGHT<sup>b</sup> U-FACTOR</u>	<u>GLAZED FENESTRATION SHGC<sup>b,c</sup></u>	<u>CEILING R-VALUE</u>	<u>WOOD FRAME WALL R-VALUE<sup>f</sup></u>	<u>MASS WALL R-VALUE<sup>g</sup></u>	<u>FLOOR R-VALUE</u>	<u>BASEMENT<sup>c,g</sup> WALL R-VALUE</u>	<u>SLAB<sup>d</sup> R-VALUE &amp; DEPTH</u>	<u>CRAWL SPACE<sup>e,g</sup> WALL R-VALUE</u>
0.30	0.55	0.25	49	20 or 13&5cih or 0&15cih	8/13	19	5ci or 13f	10ci, 2 ft	5ci or 13f

For SI: 1 foot = 304.8 mm.

ci = continuous insulation.

a. R-values are minimums. U-factors and SHGC are maximums. Where insulation is installed in a cavity that is less than the label or design thickness of the insulation, the installed R-value of the insulation shall be not less than the R-value specified in the table.

b. The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration.

**Exception:** Skylights shall be permitted to be excluded from glazed fenestration SHGC requirements provided that the SHGC for such skylights does not exceed 0.30.

c. "5ci or 13" means R-5 continuous insulation (ci) on the interior or exterior surface of the wall or R-13 cavity insulation on the interior side of the wall. "10ci or 13" means R-10 continuous insulation (ci) on the interior or exterior surface of the wall or R-13 cavity insulation on the interior side of the wall. "15ci or 19 or 13& 5ci" means R-15 continuous insulation (ci) on the interior or exterior surface of the wall; or R-19 cavity insulation on the interior side of the wall; or R-13 cavity insulation on the interior of the wall in addition to R-5 continuous insulation on the interior or exterior surface of the wall.

d. R-5 insulation shall be provided under the full slab area of a heated slab in addition to the required slab edge insulation R-value for slabs, as indicated in the table. The slab-edge insulation for heated slabs shall not be required to extend below the slab.

e. There are no SHGC requirements in the Marine Zone.

f. The first value is cavity insulation; the second value is continuous insulation. Therefore, as an example, "13 & 5" means R-13 cavity insulation plus R-5 continuous insulation.

g. Mass walls shall be in accordance with Section R402.2.5. The second R-value applies where more than half of the insulation is on the interior of the mass wall.

**RG104.4.3 Insulation installation.** Insulation must meet Grade I installation criteria in accordance with ANSI/RESNET/ICC 301.

**RG104.4.4 Air Barrier Testing.** The *building or dwelling unit* shall be tested for air leakage. The maximum air leakage rate for any *building or dwelling unit* shall not exceed 2.25 air changes per hour or 0.13 cubic feet per minute (CFM) per square foot [0.0036 m<sup>3</sup>/(s × m<sup>2</sup>)] of dwelling unit enclosure area. Testing shall be conducted in accordance with ANSI/RESNET/ICC 380, ASTM E779 or ASTM E1827 and reported at a pressure of 0.2 inch w.g. (50 Pascals). Where required by the *code official*, testing shall be conducted by an *approved third party*. A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*. Testing shall be performed at any time after creation of all penetrations of the *building thermal envelope* have been sealed.

**RG104.4.5 Duct System Location.** 100 percent of ducts and air handlers shall be located entirely within the *building thermal envelope*.

**Exception:**

1. Less than or equal to 10 feet of total duct length is outside the *building thermal envelope*.
2. Ducts systems which comply with all of the following:
  - 2.1 Ducts located in a vented attic
  - 2.2 Ducts insulated to an R-value of not less than R-8,
  - 2.3 Duct leakage to outdoors shall be less than or equal to 3.0 cubic feet per minute (85.0 L/min) per 100 square feet (9.29 m<sup>2</sup>) of conditioned floor area measured at a pressure differential of 0.1 inch w.g. (25 Pa),
  - 2.4 Ductwork shall be buried under at least 3.5 inches (88.5 mm) of blown-in insulation.
3. Systems which meet the criteria for “Ducts Located in Conditioned Space” as defined in Section R403.3.
4. Jump ducts which do not directly deliver conditioned air from the heating/cooling equipment located in attics and all joints, including boot-to-drywall, are air sealed and the jump duct is fully buried under the attic insulation.
5. Ducts and air-handling equipment located within an uninsulated and unvented crawl space or basement.
6. Ducts and air-handling equipment associated with rooftop make-up air units or dedicated outdoor air systems that provide ventilation, but also provide supplemental heating and cooling.

**RG104.4.6 Water Heater and Fixture Efficiency.** Water heaters and fixtures shall comply with Section RG104.4.6.1 to RG104.4.6.4.

**RG104.4.6.1 Water Heater Efficiency.** The water heater shall be an electric water heater and shall have a Uniform Energy Factor greater than or equal to 2.57.

**RG104.4.6.2 Fixture Efficiency.** Showerheads and bathroom sink faucets shall be WaterSense labeled.

**RG104.4.6.3 Efficient Hot Water Distribution System.** The hot water distribution system shall store no more than 1.2 gallons between the hot water source and the furthest fixture. For on-demand recirculation systems, the hot water source is considered as the point at which the branch feeding the fixture branches off the recirculation loop. This

storage limit shall be verified by either a calculation using the piping or tubing interior diameter and the system length based on plans, or by a field verification test, which demonstrates a minimum temperature rise of 10 °F by the time 1.4 gallons of water is delivered to the furthest hot water fixture.

**RG104.4.7. ENERGY STAR Appliances and Equipment.** All installed refrigerators, dishwashers, clothes washers, clothes dryers, bathroom ventilation and ceiling fans shall be ENERGY STAR qualified.

**RG104.4.8. ENERGY STAR Lighting.** All permanently installed lighting fixtures shall be LED or LED lamps shall be provided in all sockets.

**RG104.4.9. Filter.** Central forced-air HVAC systems shall have a minimum MERV 8 filter installed on all ducted heating and cooling systems and accounted for in system design.

**RG104.4.10. Indoor airPLUS.** The building shall comply with Section RG104.4.10.1 or Section RG104.4.10.2

**RG104.4.10.1 Indoor airPLUS certification.** The building is certified under EPA Indoor airPLUS. Documentation verifying that the building is certified under Indoor airPLUS shall be provided to the *code official*.

**RG104.4.10.2 Indoor airPLUS Prescriptive Requirements.** The building meets the requirements of Section RG104.4.10.2.1 to RG104.4.10.2.11

**RG104.4.10.2.1 Drain or Sump Pump.** Drain or sump pump is installed in basements and crawlspaces and discharges to daylight at least 10 feet outside the foundation or into an approved sewer system.

**Exception:**

1. Building with slab on-grade foundation
2. Building located on free-draining soils.

**RG104.4.10.2.2 Flooring.** Hard surface flooring shall be installed in kitchens, baths, entry, laundry and utility rooms.

**RG104.4.10.2.3 Pests.** Corrosion-proof rodent and bird screens shall be installed at all openings that cannot be fully sealed.

**Exception:** Clothes dryer vents

**RG104.4.10.2.4 Duct Protection.** Duct systems shall be protected from construction debris and building cavities shall not be used as air supplies or returns.

**RG104.4.10.2.5 Duct Location.** Clothes dryers shall be vented to the outdoors or plumbed to a drain in accordance with manufacturer instructions.

**RG104.4.10.2.6 Clothes Dryer Vent.** Clothes dryers vented to the outdoors or plumbed to a drain according to manufacturer's instructions.

**RG104.4.10.2.7 Duct Location.** Duct systems and airhandling equipment shall not be installed in a garage.

**RG104.4.10.2.8 Ozone generators.** No ozone generators shall be permitted.

**RG104.4.10.2.9 Materials.** Materials shall comply with RG104.4.10.2.9.1 through RG104.4.10.2.9.4

**RG104.4.10.2.9.1 Structural Plywood and OSB.** Structural plywood and oriented strand board shall use only products certified compliant with PS1 or PS2 as appropriate and made with moisture resistant adhesives as indicated by Exposure 1 or Exterior on the American Plywood Association trademark.

**RG104.4.10.2.9.2 Hardwood Plywood.** Hardwood plywood shall be certified compliant with one or more of the following:

1. Formaldehyde emissions requirements of ANSI/HPBA HP-1-2016
2. California Air Resources Board Airborn Toxics Control Measure Phase II to Reduce Formaldehyde Emissions from Composite Wood Products
3. EPA Toxic Substances Control Act Title VI certified.

**RG104.4.10.2.9.3 Particleboard and MDF products.** Particleboard and MDF products shall be certified compliant with one or more of the following:

1. California Air Resources Board Airborn Toxics Control Measure Phase II to Reduce Formaldehyde Emissions from Composite Wood Products
2. EPA Toxic Substances Control Act Title VI certified.
3. Formaldehyde emissions requirements of ANSI A208.1 or A208.2.
4. ECC Sustainability Standard by the Composite Panel Association
5. GREENGUARD or GREENGUARD GOLD certification

**RG104.4.10.2.9.4 Cabinetry.** Cabinetry shall either meet the requirements of Section RG104.4.10.2.9.1 to RG104.4.10.2.9.3 or shall be certified compliant with one or more of the following:

1. Registered brands or products produced in plants certified under the Kitchen Cabinet Manufacturer's Association's Environmental Stewardship Certification Program (ESP 05-12)
2. GREENGUARD or GREENGUARD GOLD certification

**RG104.4.10.2.10 Interior Paints and Finishes.** At least 90 percent of the interior surface area covered by site applied paints and coatings shall use low-VOC or no-VOC products certified by one or more of the following third-party standards or certifications:

1. GREENGUARD or GREENGUARD GOLD Certification for Paints and Coatings
2. Scientific Certification Systems Standard EC-10.3- 2014, Indoor Advantage Gold

3. A third-party low-emitting product list based on CA Section 01350 (CDPH Standard Method V1.2-2017)
4. Green Seal Standard GS-11, OR Green Wise and Green Wise Gold products, OR Master Painters Institute Green Performance Standards X-Green, GPS-1 or GPS-2.

**RG104.4.10.2.11 Carpets and Carpet Adhesives.** At least 90 percent of the interior surface area covered by carpet and carpet adhesives shall use products labeled with, or otherwise documented as meeting, the Carpet and Rug Institute Green Label Plus testing program criteria. Carpet cushions shall be certified to meet the Carpet and Rug Institute Green Label Plus testing program criteria.

**RG104.4.11 Renewable energy infrastructure.** The building shall comply with the requirements of RG104.4.11.1 or RG104.4.11.2.

**RG104.4.11.1 One- and two- family dwellings and townhouses.** *Dwelling units one- and two-family dwellings and townhouses shall comply with Sections RG104.4.11.1.1 through RG104.4.11.1.7.*

**Exceptions:**

1. A dwelling unit with a permanently installed on-site renewable energy system.
2. A dwelling unit with a solar-ready zone area that is less than 500 square feet (46 m) of roof area oriented between 110 degrees and 270 degrees of true north.
3. A dwelling unit with less than 500 square feet (46m ) of roof area oriented between 110 degrees and 270 degrees of true north.
4. A dwelling unit with a solar-ready zone area that is shaded for more than 70 percent of daylight hours annually.
5. A dwelling unit that complies with Appendix RC.
6. A dwelling unit with a renewable energy power purchase agreement with a duration of not less than 15 years from a utility or a community renewable energy facility and for not less than 80 percent of the estimated whole-building electric use on an annual basis.

**RG104.4.11.1.1 Solar-ready zone area.** The total area of the solar-ready zone shall not be less than 250 square feet (23.2 m) and shall be composed of areas not less than 5.5 feet (1676 mm) in one direction and not less than 80 square feet (7.4 m ) exclusive of access or set back areas as required by the *International Residential Code*.

**Exception:** Dwelling units in townhouses three stories or less in height above grade plane and with a total floor area less than or equal to 2,000 square feet (186 m) per dwelling shall be permitted to have a solar-ready zone area of not less than 150 square feet (14 m ).

**RG104.4.11.1.2 Obstructions.** Solar-ready zones shall be free from obstructions, including but not limited to vents, chimneys, and roof mounted equipment.

**RG104.4.11.1.3 Electrical service reserved space.** The main electrical service panel shall have a reserved space for a dual pole circuit breaker and shall be labeled “For Future Solar Electric.” The reserved space shall be at the opposite (load) end of the busbar from the primary energy source and shall not be on a panel utilizing feed through lugs.

**RG104.4.11.1.4 Electrical interconnection.** An electrical junction box shall be installed within 24 inches (610 mm) of the main electrical service panel and shall be connected to a capped roof penetration sleeve or a location in the attic that is within 3 feet (914 mm) of the solar ready zone by a minimum 1 inch (25 mm) nonflexible metallic conduit or permanently installed wire as approved by the code official. Where the interconnection terminates in the attic, location shall be no less than 12 inches (35 mm) above ceiling insulation. Both ends of the interconnection shall be labeled “For Future Solar Electric”.

**RG104.4.11.1.5 Electrical equipment reserved space.** A exterior wall area reserved for future solar electrical equipment shall meet all of the following requirements:

1. The exterior wall area shall be not less than 4 feet (1219 mm) by 4 feet (1219 mm).
2. The exterior wall area shall have adequate workspace with no obstructions within 30 inches (762 mm) wide and 37 inches (940 mm) deep in accordance with NFPA 70 Section 110.26.
3. The exterior wall area shall be within 5 feet (1524 mm) of the main utility meter.
4. All gas meters and water sources shall be no less than 3 feet (914 mm) away from the exterior wall area.

**RG104.4.11.1.6 Construction Documents** The construction documents shall provide details for dedicated roof area, structural design for roof dead and live load, and routing of conduit or pre-wiring from *solar-ready zone* to electrical service panel or plumbing from solar-ready zone to service *water heating system*.

**RG104.4.11.1.7 Construction Document Certificate.** A permanent certificate, indicating the solar-ready zone and other requirements of this section, shall be posted near the electrical distribution panel, water heater or other conspicuous location by the builder or registered design professional.

**RG104.4.11.2 Group R occupancies.** Buildings in Group R-2, R-3 and R-4 shall comply with Section CG104.1.

**RG104.4.12 HVAC System Design.** The HVAC system designer shall comply with one of the following:

1. The HVAC system designer shall complete an HVAC design report compliant with ANSI/RESNET/ACCA 310 and the ENERGY STAR National HVAC Design Supplement

2. The HVAC system designer shall be certified by an EPA-recognized H-QUITO and complete the National HVAC Design Report, Version 3.2 and the National HVAC Commissioning Checklist, Version 3.2

**RG104.4.13 Water Management.** The builder shall complete the National Water Management System Builder Requirements, Version 3.2.