

# Las Cruces Commercial Stretch Code

Code Language:

## APPENDIX CG LAS CRUCES GREEN STRETCH CODE

### SECTION CG101

**RG101.1 General.** *Commercial buildings* shall comply with the 2021 International Energy Conservation Code. Existing commercial buildings shall comply with Chapter 5 and Section CG103. New commercial buildings shall comply with Sections CG103 through CG105.

### SECTION CG102 GENERAL DEFINITIONS

**COMMUNITY RENEWABLE ENERGY FACILITY.** A facility that produces energy harvested from *renewable energy resources* and is qualified as a community energy facility under applicable jurisdictional statutes and rules.

**DEMAND RESPONSE SIGNAL.** A signal that indicates a price or a request to modify electricity consumption.

**DEMAND RESPONSIVE CONTROL.** A control capable of receiving and automatically responding to a *demand response signal*.

**FINANCIAL RENEWABLE ENERGY POWER PURCHASE AGREEMENT.** A financial arrangement between a renewable electricity generator and a purchaser wherein the purchaser pays or guarantees a price to the generator for the project's renewable generation. Also known as a "financial power purchase agreement" and "virtual power purchase agreement."

**PHYSICAL RENEWABLE ENERGY POWER PURCHASE AGREEMENT.** A contract for the purchase of renewable electricity from a specific renewable electricity generator to a purchaser of renewable electricity.

**RENEWABLE ENERGY CERTIFICATE (REC):** A market-based instrument that represents and conveys the environmental, social, and other non-power attributes of one megawatt hour of renewable electricity generation and could be sold separately from the underlying physical electricity associated with *renewable energy resources*; also known as "energy attribute" and "energy attribute certificate" (EAC).

### SECTION CG103 ALL ELECTRIC BUILDINGS

**CG103.1 Application.** Commercial buildings shall be *all-electric buildings* and comply with Section C401.2.1 or C401.2.2.

**CG103.2 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 and CG103.3.

**CG103.3 Heat pump supplementary equipment.** Heat pumps having electric resistance equipment for supplementary space or water heating shall have controls that limit supplemental heat operation to only those times when one of the following applies:

1. The heat pump is operating in defrost mode.
2. The vapor compression cycle malfunctions.
3. For space heating systems, the thermostat malfunctions.
4. For space heating systems, the vapor compression cycle cannot provide the necessary heating energy to satisfy the thermostat setting.
5. For water heating, the heat pump water heater cannot maintain an output water temperature of at least 120°F (49°C)

New supplementary space and water heating systems for heat pump equipment shall not be permitted to have a heating input capacity greater than the heating input capacity of the heat pump equipment.

## SECTION CG104 ELECTRIC VEHICLE READY

**CG104.1 Electric Vehicle Power Transfer Infrastructure.** The number of EV spaces, EV capable spaces and EV ready spaces shall be determined in accordance with Table CG104.1.

**Table CG104.1**  
**REQUIRED EV POWER TRANSFER INFRASTRUCTURE**

<b>OCCUPANCY</b>	<b>EVSE SPACES</b>	<b>EV READY SPACES</b>	<b>EV CAPABLE SPACES</b>
GROUP A	15%	0	10%
GROUP B	10%	0	15%
GROUP E	2%	0	2%
GROUP F	2%	0	2%
GROUP H	2%	0	0%
GROUP I	2%	0	2%
GROUP M	15%	0	10%
R-1	20%	0	50%
R-2	20%	50%	0%
R-3 AND R-4	1%	0	2%
GROUP S exclusive of parking garages	1%	0	0%
S-2 parking garages	20%	0	10%

**CG104.2 Electric Vehicle Monitoring.** Table CG104.2 shall replace Table C405.12.2.

**TABLE CG104.2 ENERGY USE CATEGORIES**

<u>LOAD CATEGORY</u>	<u>DESCRIPTION OF ENERGY USE</u>
<u>Total HVAC system</u>	<u>Heating, cooling and ventilation, including but not limited to fans, pumps, boilers, chillers and water heating. Energy used by 120-volt equipment, or by 208/120-volt equipment that is located in a building where the main service is 480/277-volt power, is permitted to be excluded from total HVAC system energy use.</u>
<u>Interior lighting</u>	<u>Lighting systems located within the building.</u>
<u>Exterior lighting</u>	<u>Lighting systems located on the building site but not within the building.</u>
<u>Plug loads</u>	<u>Devices, appliances and equipment connected to convenience receptacle outlets.</u>
<u>Process load</u>	<u>Any single load that is not included in an HVAC, lighting or plug load category and that exceeds 5 percent of the peak connected load of the whole building, including but not limited to data centers, manufacturing equipment and commercial kitchens.</u>
<u>Electric vehicle charging</u>	<u>Electric vehicle charging loads.</u>
<u>Building operations and other miscellaneous loads</u>	<u>The remaining loads not included elsewhere in this table, including but not limited to vertical transportation systems, automatic doors, motorized shading systems, ornamental fountains, ornamental fireplaces, swimming pools, in-ground spas and snow-melt systems.</u>

**SECTION CG105  
RENEWABLE ENERGY SYSTEMS**

**CG105.1 Renewable energy systems.** *Buildings* shall comply with CG105.1.1 through CG105.1.4.

**CG105.1.1 On-site renewable energy systems.** *Buildings* shall install equipment for on-site renewable electricity generation with a direct current (DC) nameplate power rating of not less than 0.75 W/ft<sup>2</sup> (8.1 W/m<sup>2</sup>) multiplied by the sum of the gross conditioned floor area of all floors not to exceed the combined gross conditioned floor area of the three largest floors.

**Exception:** The following *buildings* or *building sites* shall comply with Section CG105.1.1

1. A *building site* located where an unshaded flat plate collector oriented toward the equator and tilted at an angle from horizontal equal to the latitude receives an annual daily average incident solar radiation less than 1.1 kBtu/ft<sup>2</sup>·day (3.5 kWh/m<sup>2</sup>·day).
2. A *building* where more than 80% of the roof area is covered by any combination of permanent obstructions such as, but not limited to, mechanical equipment, vegetated space, access, pathways, or occupied roof terrace.
3. Any *building* where more than 50% of roof area is shaded from direct-beam sunlight by natural objects or by structures that are not part of the building for more than 2500 annual hours between 8:00 a.m. and 4:00 p.m.
4. A *building* with gross conditioned floor area less than 5,000 square feet (465 m<sup>2</sup>).

**CG105.1.2 Off-site renewable energy.** *Buildings* that qualify for one or more of the exceptions to Section CG105.1.1 and do not meet the requirements of Section CG105.1.1 either in part or in full, with an *on-site renewable energy system*, shall procure off-site renewable electrical energy, in accordance with CG105.1.2.1 and CG105.1.2.2, that shall not be less than the total off-site renewable electrical energy determined in accordance with Equation CG-1.

$$TRE_{OFF} = (1.75 \text{ kWh/W} * 0.75 \text{ W/sq.ft.} * FLRA - IRE_{ON}) * 15 \quad \text{(Equation CG-1)}$$

Where:

TRE<sub>OFF</sub> = Total off-site renewable electrical energy in kilowatt-hours (kWh) to be procured

FLRA = the sum of the gross conditioned floor area of all floors not to exceed the combined floor area of the three largest floors.

IRE<sub>ON</sub> = Annual on-site renewable electrical energy generation of a new *on-site renewable energy system*, to be installed as part of the *building* project, whose rated capacity is less than the rated capacity required in Section C405.14.1.

**CG105.1.2.1 Off site procurement.** The building owner as defined in the International Building Code shall procure and be credited for the total amount of off-site renewable electrical energy, not less than required in accordance with Equation CG-1, with one or more of the following:

1. A *physical renewable energy power purchase agreement*.
2. A *financial renewable energy power purchase agreement*.
3. A *community renewable energy facility*.

4. Off-site renewable energy system owned by the building property owner.

**CG105.1.2.2 Off site contract.** The renewable energy shall be delivered or credited to the *building site* under an energy contract with a duration of not less than 15 years. The contract shall be structured to survive a partial or full transfer of ownership of the building property.

**CG105.1.3 Renewable energy certificate documentation.** The property owner or owner’s authorized agent shall demonstrate that where RECs or EACs are associated with on-site and off-site renewable energy production required by Sections CG105.1.1 and CG105.1.2 all of the following criteria for RECS and EACS shall be met:

1. Are retained and retired by or on behalf of the property owner or tenant for a period of not less than 15 years;
2. Are created within a 12-month period of the use of the REC; and
3. Are from a generating asset constructed no more than 5 years before the issuance of the certificate of occupancy.

**CG105.1.4 Renewable energy certificate purchase.** A *building* that qualifies for one or more of the exceptions to Section CG105.1.1 and where it can be demonstrated to the code official that the requirements of Section CG105.1.2 cannot be met, the building owner shall contract for renewable electricity products complying with the Green-e Energy National Standard for Renewable Electricity products equivalent to five times the amount of total off-site renewable energy calculated in accordance with Equation CG-1.

## **SECTION CG106 DEMAND RESPONSIVE CONTROLS**

**CG106.1 Demand Responsive Water Heating.** Electric storage water heaters with a rated water storage volume of 40 gallons (150L) to 120 gallons (450L) and a nameplate input rating equal to or less than 12kW shall be provided with demand responsive controls in accordance with Table CG106.1 or another equivalent *approved* standard.

**Exceptions:**

1. Water heaters that provide a hot water delivery temperature of 180°F (82°C) or greater
2. Water heaters that comply with Section IV, Part HLW or Section X of the ASME Boiler and Pressure Vessel Code
3. Water heaters that use 3-phase electric power

**TABLE CG106.1  
DEMAND RESPONSIVE CONTROLS FOR WATER HEATING**

<u>Equipment Type</u>	<u>Controls</u>	
<u>Electric storage water heaters</u>	<u>Manufactured before 7/1/2025</u>	<u>Manufactured on or after 7/1/2025</u>
	<u>ANSI/CTA-2045-B Level 1 and also capable of initiating water heating to</u>	<u>ANSI/CTA-2045-B Level 2, except “Price Stream</u>

	<u>meet the temperature set point in response to a demand response signal.</u>	<u>Communication” functionality as defined in the standard.</u>
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*Add new text as follows:*

**CG106.2 Demand responsive controls.** Buildings shall be provided with demand responsive controls capable of executing the following actions in response to a demand response signal:

1. Automatically increasing the zone operating cooling set point by the following values: 1°F (0.5°C), 2°F (1°C), 3°F (1.5°C), and 4°F (2°C).
2. Automatically decreasing the zone operating heating set point by the following values: 1°F (0.5°C), 2°F (1°C), 3°F (1.5°C), and 4°F (2°C).

Where a demand response signal is not available the heating and cooling system controls shall be capable of performing all other functions. Where thermostats are controlled by direct digital control including, but not limited to, an energy management system, the system shall be capable of demand responsive control and capable of adjusting all thermal setpoints to comply. The demand responsive controls shall comply with either Section CG106.2.1 or Section CG106.2.2

**Exceptions:**

1. Group I occupancies
2. Group H occupancies
3. Controls serving data center systems
4. Occupancies or applications requiring precision in indoor temperature control as approved by the code official
5. Controls that serve only fossil fuel equipment

**CG106.2.1 Air conditioners and heat pumps with two or more stages of control and cooling capacity of less than 65,000 Btu/h.** Thermostats for Air conditioners and heat pumps with two or more stages of control and a cooling capacity less than 65,000 Btu/h (19 kW) shall be provided with a demand responsive control that complies with the communication and performance requirements of AHRI 1380.

**CG106.2.2 All other HVAC systems.** Thermostats for HVAC systems shall be provided with a demand responsive control that complies with one of the following:

1. Certified OpenADR 2.0a VEN, as specified under Clause 11, Conformance
2. Certified OpenADR 2.0b VEN, as specified under Clause 11, Conformance
3. Certified by the manufacturer as being capable of responding to a demand response signal from a certified OpenADR 2.0b VEN by automatically implementing the control functions requested by the VEN for the equipment it controls
4. IEC 62746-10-1
5. The communication protocol required by a controlling entity, such as a utility or service provider, to participate in an automated demand response program
6. The physical configuration and communication protocol of CTA 2045-A or CTA 2045-B.

**SECTION CG107**  
**ADDITIONAL ENERGY EFFICIENCY**

**CG107.1 Additional energy efficiency credit requirements.** New buildings shall achieve an additional 5 credits from Tables C406.1(1) through C406.1(5) where the table is selected based on the use group of the building and from credit calculations as specified in relevant subsections of Section C406. Where a building contains multiple-use groups, credits from each use group shall be weighted by floor area of each group to determine the weighted average building credit. Credits from the tables or calculation shall be achieved where a building complies with one or more of the following:

1. More efficient HVAC performance in accordance with Section C406.2.
2. Reduced lighting power in accordance with Section C406.3.
3. Enhanced lighting controls in accordance with Section C406.4.
4. On-site supply of renewable energy in accordance with Section CG106.2.
5. Provision of a dedicated outdoor air system for certain HVAC equipment in accordance with Section C406.6.
6. High-efficiency service water heating in accordance with Section C406.7.
7. Enhanced envelope performance in accordance with Section C406.8.
8. Reduced air infiltration in accordance with Section C406.9
9. Where not required by Section C405.12, include an energy monitoring system in accordance with Section C406.10.
10. Where not required by Section C403.2.3, include a fault detection and diagnostics (FDD) system in accordance with Section C406.11.
11. Efficient kitchen equipment in accordance with Section C406.12.

**CG106.2 On-site renewable energy.**

Buildings sites shall comply with Section CG102.2.1 or CG102.2.2.

**CG102.2.1 Basic renewable credit.** The total minimum ratings of on-site renewable energy systems, not including systems used for credits under Section C406.7.2 or systems used for compliance with Section CG104.1, shall be one of the following:

1. Not less than 0.86 Btu/h per square foot (2.7 W/m<sup>2</sup>) or 0.25 watts per square foot (2.7 W/m<sup>2</sup>) of conditioned floor area.
2. Not less than 2 percent of the annual energy used within the building for building mechanical and service water-heating equipment and lighting regulated in Section C405.

**CG102.2.2 Enhanced renewable credit.** Where the total minimum ratings of on-site renewable energy systems exceed the rating in Section CG102.2.1, additional energy efficiency credits shall be determined based on Equation CG-2, rounded to the nearest whole number.

$$\underline{AEECRRa = AEEC2.5 \times (RRa - RR_{REQ} - RR_{WH}) / RR1 \text{ (Equation CG-2)}}$$

where:

$$\underline{AEECRRa = \text{Section CG102.2.2 additional energy efficiency credits.}}$$

$AEEC2.5$  = Section CG106.2 credits from Tables C406.1(1) through C406.1(5).

$RRa$  = Actual total minimum ratings of *on-site renewable energy* systems (in Btu/h, watts per square foot or W/m<sup>2</sup>).

$RR1$  = Minimum ratings of *on-site renewable energy* systems required by Section CG102.2.1 (in Btu/h, watts per square foot or W/m<sup>2</sup>).

$RR_{REQ}$  = Minimum rating of installed on-site renewable energy systems required by Section CG104.1 (in BTU/h, watts per square foot or W/m<sup>2</sup>)

$RR_{WH}$  = Minimum rating of installed on-site renewable energy systems used for credits under Sections C406.7.2



Add new reference standard as follows:

<b>AHRI</b>	Air-Conditioning, Heating, & Refrigeration Institute 2111 Wilson Blvd, Suite 500 Arlington, VA 22201
<u>1380-2019</u>	<u>Demand Response through Variable Capacity HVAC Systems in Residential and Small Commercial Applications</u>
<b>ANSI</b>	American National Standards Institute 25 West 43rd Street, 4th Floor New York, NY 10036
<u>ANSI/CTA-2045-A-2018</u>	<u>Modular Communications Interface for Energy Management</u>
<u>ANSI/CTA-2045-B-2019</u>	<u>Modular Communications Interface for Energy Management</u>
<b><u>ASME</u></b>	<u>ASME</u> <u>Two Park Avenue</u> <u>New York, NY 10016-5990</u>  <u>(800) 843-2763</u>
<u>BPVC</u>	<u>Boiler and Pressure Vessel Code</u>
<b><u>IEC</u></b>	<u>IEC Regional Centre for North America</u> <u>IEC International Electrotechnical Commission</u> <u>446 Main Street 16th Floor</u> <u>Worcester, MA 016808</u>
<u>IEC 62746-10-1 - 2018</u>	<u>Systems interface between customer energy management system and the power management system – Part 10-1: Open automated demand response</u>
<b><u>UL</u></b>	<u>UL LLC</u> <u>333 Pfingsten Road</u> <u>Northbrook, IL 60062</u>
<u>UL 2202-2009</u>	<u>Electric Vehicle (EV) Charging System- with revisions through February 2018</u>
<u>UL 2594-2016</u>	<u>Standard for Electric Vehicle Supply Equipment</u>