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## SECTION 110.10 – MANDATORY REQUIREMENTS FOR SOLAR READY BUILDINGS

### (a) Covered Occupancies.

1. **Single Family Residences.** Single family residences located in subdivisions with ten or more single family residences and where the application for a tentative subdivision map for the residences has been deemed complete, by the enforcement agency, on or after January 1, 2014, shall comply with the requirements of Section 110.10(b) through 110.10(e).
2. **Low-rise Multi-family Buildings.** Low-rise multi-family buildings shall comply with the requirements of Section 110.10(b) through 110.10(d).
3. **Hotel/Motel Occupancies and High-rise Multi-family Buildings.** Hotel/motel occupancies and high-rise multi-family buildings with ten stories or fewer shall comply with the requirements of Section 110.10(b) through 110.10(d).
4. **All Other Nonresidential Buildings.** All other nonresidential buildings with three stories or fewer shall comply with the requirements of Section 110.10(b) through 110.10(d).

### (b) Solar Zone.

1. **Minimum Area.** The solar zone shall have a minimum total area as described below. The solar zone shall comply with access, pathway, smoke ventilation, and spacing requirements as specified in Title 24, Part 9 or other Parts of Title 24 or in any requirements adopted by a local jurisdiction. The solar zone total area shall be comprised of areas that have no dimension less than five feet and are no less than 80 square feet each for buildings with roof areas less than or equal to 10,000 square feet or no less than 160 square feet each for buildings with roof areas greater than 10,000 square feet.

- A. **Single Family Residences.** The solar zone shall be located on the roof or overhang of the building and have a total area no less than 250 square feet.

**EXCEPTION 1 to Section 110.10(b)1A:** Single family residences with a permanently installed solar electric system having a nameplate DC power rating, measured under Standard Test Conditions, of no less than 1000 watts.

**EXCEPTION 2 to Section 110.10(b)1A:** Single family residences with a permanently installed domestic solar water-heating system meeting the installation criteria specified in the Reference Residential Appendix RA4 and with a minimum solar savings fraction of 0.50.

**EXCEPTION 3 to Section 110.10(b)1A:** Single family residences with three stories or more and with a total floor area less than or equal to 2000 square feet and having a solar zone total area no less than 150 square feet.

**EXCEPTION 4 to Section 110.10(b)1A:** Single family residences located in Climate zones 8-14 and the Wildland-Urban Interface Fire Area as defined in Title 24, Part 2 and having a whole house fan and having a solar zone total area no less than 150 square feet.

**EXCEPTION 5 to Section 110.10(b)1A:** Buildings with a designated solar zone area that is no less than 50 percent of the potential solar zone area. The potential solar zone area is the total area of any low-sloped roofs where the annual solar access is 70 percent or greater and any steep-sloped roofs oriented between 110 degrees and 270 degrees of true north where the annual solar access is 70 percent or greater. Solar access is the ratio of solar insolation including shade to the solar insolation without shade. Shading from obstructions located on the roof or any other part of the building shall not be included in the determination of annual solar access.

**EXCEPTION 6 to Section 110.10(b)1A:** Single family residences having a solar zone total area no less than 150 square feet and where all thermostats comply with Reference Joint Appendix JA5 and are capable of receiving and responding to Demand Response Signals prior to granting of an occupancy permit by the enforcing agency.

**EXCEPTION 7 to Section 110.10(b)1A:** Single family residences meeting the following conditions:

- A. All thermostats comply with Reference Joint Appendix JA5 and are capable of receiving and responding to Demand Response Signals prior to granting of an occupancy permit by the enforcing agency.
- B. All applicable requirements of Section 150.0(k), except as required below:
  - i. All permanently installed indoor lighting is high efficacy as defined in TABLE 150.0-A or 150.0-B and is installed in kitchens, bathrooms, utility rooms, and garages at a minimum.
  - ii. All permanently installed lighting in bathrooms is controlled by a vacancy sensor.  
**EXCEPTION to EXCEPTION 7Bii:** One high efficacy luminaire as defined in TABLE 150.0-A or 150.0-B with total lamp wattage rated to consume no greater than 26 watts of power is not required to be controlled by a vacancy sensor.
  - iii. Every room which does not have permanently installed lighting has at least one switched receptacle installed.
  - iv. Permanently installed night lights complying with Section 150.0(k)1E are allowed.
  - v. Lighting integral to exhaust fans complying with Section 150.0(k)1F is allowed.
  - vi. All permanently installed outdoor lighting is high efficacy as defined in TABLE 150.0-A or 150.0-B and is controlled as required in Section 150.0(k)9Ai and iii.

- B. **Low-rise and High-rise Multi-family Buildings, Hotel/Motel Occupancies, and Nonresidential Buildings.** The solar zone shall be located on the roof or overhang of the building or on the roof or overhang of another structure located within 250 feet of the building or on covered parking installed with the building project and have a total area no less than 15 percent of the total roof area of the building excluding any skylight area.

**EXCEPTION 1 to Section 110.10(b)1B:** Buildings with a permanently installed solar electric system having a nameplate DC power rating, measured under Standard Test Conditions, of no less than one watt per square foot of roof area.

**EXCEPTION 2 to Section 110.10(b)1B:** Buildings with a permanently installed domestic solar water-heating system complying with Section 150.1(c)8Ciii.

**EXCEPTION 3 to Section 110.10(b)1B:** Buildings with a designated solar zone area that is no less than 50 percent of the potential solar zone area. The potential solar zone area is the total area of any low-sloped roofs where the annual solar access is 70 percent or greater and any steep-sloped roofs oriented between 110 degrees and 270 degrees of true north where the annual solar access is 70 percent or greater. Solar access is the ratio of solar insolation including shade to the solar insolation without shade. Shading from obstructions located on the roof or any other part of the building shall not be included in the determination of annual solar access.

**EXCEPTION 4 to Section 110.10(b)1B:** Low-rise and high-rise multifamily buildings meeting the following conditions:

- A. All thermostats in each dwelling unit comply with Reference Joint Appendix JA5 and are capable of receiving and responding to Demand Response Signals prior to granting of an occupancy permit by the enforcing agency.
- B. All applicable requirements of Section 150.0(k), except as required below:
  - i. All permanently installed indoor lighting in each dwelling unit is high efficacy as defined in TABLE 150.0-A or 150.0-B and is installed in kitchens, bathrooms, utility rooms, and private garages at a minimum.
  - ii. All permanently installed lighting in bathrooms is controlled by a vacancy sensor.  
**EXCEPTION to EXCEPTION 4Bii:** One high efficacy luminaire as defined in TABLE 150.0-A or 150.0-B with total lamp wattage rated to consume no greater than 26 watts of power is not required to be controlled by a vacancy sensor.
  - iii. Every room which does not have permanently installed lighting has at least one switched receptacle installed.

- iv. Permanently installed night lights complying with Section 150.0(k)1E are allowed.
- v. Lighting integral to exhaust fans complying with Section 150.0(k)1F is allowed.
- vi. All permanently installed outdoor lighting for private patios, entrances, balconies, and porches is high efficacy as defined in TABLE 150.0-A or 150.0-B and is controlled as required in Section 150.0(k)9Ai and iii.

**EXCEPTION 5 to Section 110.10(b)1B:** Buildings where the roof is designed and approved to be used for vehicular traffic or parking or for a heliport.

2. **Orientation.** All sections of the solar zone located on steep-sloped roofs shall be oriented between 110 degrees and 270 degrees of true north.
3. **Shading.**
  - A. No obstructions, including but not limited to, vents, chimneys, architectural features, and roof mounted equipment, shall be located in the solar zone.
  - B. Any obstruction, located on the roof or any other part of the building that projects above a solar zone shall be located at least twice the distance, measured in the horizontal plane, of the height difference between the highest point of the obstruction and the horizontal projection of the nearest point of the solar zone, measured in the vertical plane.

**EXCEPTION to Section 110.10(b)3:** Any roof obstruction, located on the roof or any other part of the building, that is oriented north of all points on the solar zone.

4. **Structural Design Loads on Construction Documents.** For areas of the roof designated as solar zone, the structural design loads for roof dead load and roof live load shall be clearly indicated on the construction documents.

**NOTE:** Section 110.10(b)4 does not require the inclusion of any collateral loads for future solar energy systems.

(c) **Interconnection Pathways.**

1. The construction documents shall indicate a location for inverters and metering equipment and a pathway for routing of conduit from the solar zone to the point of interconnection with the electrical service. For single family residences the point of interconnection will be the main service panel.
2. The construction documents shall indicate a pathway for routing of plumbing from the solar zone to the water-heating system.

- (d) **Documentation.** A copy of the construction documents or a comparable document indicating the information from Sections 110.10(b) through 110.10(c) shall be provided to the occupant.

(e) **Main Electrical Service Panel.**

1. The main electrical service panel shall have a minimum busbar rating of 200 amps.
2. The main electrical service panel shall have a reserved space to allow for the installation of a double pole circuit breaker for a future solar electric installation.
  - A. **Location.** The reserved space shall be positioned at the opposite (load) end from the input feeder location or main circuit location.
  - B. **Marking.** The reserved space shall be permanently marked as “For Future Solar Electric”.

## **SUBCHAPTER 3**

# **NONRESIDENTIAL, HIGH-RISE RESIDENTIAL, HOTEL/MOTEL OCCUPANCIES, AND COVERED PROCESSES—MANDATORY REQUIREMENTS**

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### **SECTION 120.0— GENERAL**

Sections 120.1 through 120.9 establish requirements for the design and installation of building envelopes, ventilation, space-conditioning and service water-heating systems and equipment in nonresidential, high-rise residential, and hotel/motel buildings as well as covered processes that are subject to Title 24, Part 6. All such buildings and covered processes shall comply with the applicable provisions of Sections 120.1 through 120.9.