



2022 CITY OF SCOTTSDALE AMENDMENTS
TO THE
INTERNATIONAL ENERGY CONSERVATION CODE,
2021 EDITION

Ordinance No. 4575, Resolution No. 12503

**2022 City of Scottsdale Amendments
to the International Energy Conservation Code, 2021 Edition**

**SCOTTSDALE REVISED CODE
CHAPTER 31 – BUILDING AND CONSTRUCTION REGULATIONS**

ARTICLE VII. INTERNATIONAL ENERGY CONSERVATION CODE

DIVISION 1. ADOPTED CODE

Sec. 31-110. International Energy Conservation Code adopted and amended.

The International Energy Conservation Code (IECC), 2021 Edition, including appendices CB and RB, as published by the International Code Council, Inc., declared a public record by city Resolution No. 12503, are adopted by reference as part of the city Building Code.

DIVISION 2. AMENDMENTS TO IECC

Sec. 31-111. IECC Amendments – Chapter 1 (Commercial).

Only the following portion of CHAPTER 1, SCOPE AND ADMINISTRATION, is amended:

(a) Section C101.1, *Title, is amended to read as follows:*

C101.1 Title. This code shall be known as the “*Energy Code*” of the City of Scottsdale and shall be cited as such. It is referred to herein as “this code.”

Sec. 31-112. IECC Amendments – Chapter 2 (Commercial).

Only the following portion of CHAPTER 2, DEFINITIONS, is amended:

(a) Section C202, *General Definitions, is amended by adding the following:*

AUTOMATIC LOAD MANAGEMENT SYSTEMS (ALMS). A control system that allows multiple connected *EVSE* to share a circuit or panel and automatically reduce power at each charger, reducing the total connected electrical capacity of all *EVSE*.

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). The conductors, including the ungrounded, grounded, and equipment grounding conductors, and the electric vehicle connectors, attachment plugs, and all other fittings, devices, power outlets, or apparatus installed specifically for the purpose of transferring energy between the premises wiring and the electric vehicle.

EV CAPABLE SPACE. A designated parking space provided with electrical raceway and capacity to support future EV charging.

EV INSTALLED SPACE. A designated parking space with dedicated electric vehicle supply equipment.

Sec. 31-113. IECC Amendments – Chapter 4 (Commercial).

Only the following portions of CHAPTER 4, COMMERCIAL ENERGY EFFICIENCY, are amended:

- (a) Section C402.3, *Roof solar reflectance and thermal emittance*, is amended to read as follows, with the exceptions and table remaining unchanged.

C402.3 Roof solar reflectance and thermal emittance. Low-sloped roof surfaces over conditioned and unconditioned spaces in *Climate Zones 0 through 3* shall comply with one or more of the options in Table C402.3.

- (b) Section C405.12, *Energy Monitoring*, is deleted in its entirety.

- (c) A new Section C405.13, *Electric Vehicle (EV) charging infrastructure*, is added as follows:

C405.13 Electric Vehicle (EV) charging infrastructure. New construction shall accommodate future installation and use of *Electric Vehicle Supply Equipment (EVSE)* in accordance with the *National Electrical Code (NFPA 70)*.

C405.13.1 Required EV installed spaces and EV capable spaces. Parking shall be provided with *EV installed spaces* and *EV capable spaces* in accordance with Table C405.13.1. The required number of *EV installed spaces* or *EV capable spaces* shall be rounded up to the next highest whole number. Where a branch circuit serves a single charging space, it shall have a capacity not less than of 8.3 kVA (40A, 208/240V). Where a branch circuit serves multiple charging spaces, an *Automatic Load Management System (ALMS)* may be used to reduce the total electrical capacity provided that all charging spaces are capable of simultaneously charging at a minimum rate of 4.1 kVA (20A, 208/240V).

For *EV capable spaces*, the electrical service panel shall have reserved circuit breaker space(s) labeled “Future EV Charging”. Raceway(s) shall be installed from the electrical service panel to outlet box(es) within the planned EV charging parking area(s). Outlet box(es) shall be labeled “Future EV charging”.

**TABLE C405.13.1
ELECTRIC VEHICLE CHARGING INFRASTRUCTURE REQUIREMENTS**

Occupancy Group	Minimum number of EV Installed Spaces ^a	Minimum number of EV Capable Spaces ^a
Group R-1 (hotels, motels) and Group R-2 (apartments, condominiums)	4% of total required parking spaces	20% of total required parking spaces

^a Parking spaces designated for other than passenger vehicles may be excluded from the number of parking spaces used to calculate the minimum number of EV spaces.

C405.13.2 Documentation. Construction documents shall indicate location(s) for *EV installed spaces* and *EV capable spaces*. Information shall be provided on raceway methods, wiring schematics and electrical load calculations to verify the electrical panel

service capacity, including any on-site distribution transformers, to ensure sufficient capacity to simultaneously charge all required EV spaces at the rated amperage of the EVSE.

(d) Table C406.10.2, *Energy Use Categories*, is revised by adding the following:

**TABLE C406.10.2
ENERGY USE CATEGORIES**

LOAD CATEGORY	DESCRIPTION OF ENERGY USE
Electric vehicle charging	Energy used for electric vehicle charging

(e) Table C407.2, *Requirements for Total Building Performance*, is revised by adding the following:

**TABLE C407.2
REQUIREMENTS FOR TOTAL BUILDING PERFORMANCE**

Envelope	
C402.3	Roof solar reflectance and thermal emittance

(f) *Exceptions to Section C408.2 Mechanical systems and service water-heating systems commissioning and completion requirements*, are amended to read as follows:

Exceptions: The following systems are exempt:

1. Mechanical systems in buildings where the total mechanical equipment capacity is less than 180,000 Btu/h (52.8 kW or 15 tons) for cooling, 300,000 Btu/h (87.9 kW) for space-heating and 10,000 cfm for ventilation.
2. Service water-heating systems rated under 50,000 Btu/h (14.7 kW).
3. Water pumping and mixing systems under 5 hp (4kW).
4. Systems included in Section C403.5 that serve individual *dwelling units* and *sleeping units*.

Sec. 31-114. IECC Amendments – Chapter 1 (Residential).

Only the following portion of CHAPTER 1, SCOPE AND ADMINISTRATION, is amended:

(a) *Section R101.1, Title, is amended to read as follows:*

R101.1 Title. These regulations shall be known as the “Energy Code” of the City of Scottsdale, hereinafter referred to in this Article as “this code”.

Sec. 31-115. IECC Amendments – Chapter 2 (Residential).

Only the following portion of CHAPTER 2, DEFINITIONS, is amended:

(a) *Section R202, Definitions, is amended by adding the following:*

ELECTRIC VEHICLE SUPPLY EQUIPMENT (EVSE). The conductors, including the ungrounded, grounded, and equipment grounding conductors, and the electric vehicle connectors, attachment plugs, and all other fittings, devices, power outlets, or apparatus

installed specifically for the purpose of transferring energy between the premises wiring and the electric vehicle.

LOW-SLOPED ROOF. A roof having a slope less than 2 units vertical in 12 units horizontal.

Sec. 31-116. IECC Amendments – Chapter 4 (Residential).

Only the following portions of CHAPTER 4, RESIDENTIAL ENERGY EFFICIENCY, are amended:

(a) *Reserved.*

(b) *Reserved.*

(c) *Table R402.4.1.1, Air Barrier, Air Sealing and Insulation Installation, Rim Joists and footnote b are revised to read as follows:*

COMPONENT	AIR BARRIER CRITERIA INSULATION	INSTALLATION CRITERIA
Rim joists	Rim joists shall include an air barrier. The junctions of the rim board to the sill plate and the rim board to the subfloor shall be air sealed.	Rim joists shall be insulated so that the insulation maintains permanent contact with the exterior rim board. ^b

b. Insulation full enclosure is not required in unconditioned/ventilated attic spaces and at rim joists.

(d) *Section R402.4.6, Electrical and communication outlet boxes (air-sealed boxes), is amended to read as follows:*

R402.4.6 Electrical and communication outlet boxes (air-sealed boxes). Where air-sealed boxes are required by Table R402.4.1.1, electrical and communication outlet boxes shall comply with all of the following:

1. be tested in accordance with NEMA OS 4, Requirements for Air-Sealed Boxes for Electrical and Communication Applications;
2. have an air leakage rate of not greater than 2.0 cubic feet per minute (0.944 L/s) at a pressure differential of 1.57 psf (75 Pa);
3. be marked “NEMA OS 4” or “OS 4” in accordance with NEMA OS 4; and
4. be installed per the manufacturer’s instructions and with any supplied components required to achieve compliance with NEMA OS 4.

(e) *A new Section R402.6, Roof solar reflectance and thermal emittance, is added to read as follows:*

R402.6 Roof solar reflectance and thermal emittance. Where not prohibited by the city environmentally sensitive lands ordinance (ESLO), low-sloped roof surfaces over conditioned and unconditioned spaces in *Climate Zones* 0 through 3 shall comply with one or more of the options in Table R402.6.

Exception: Portions of the roof that are covered by roof decks, vegetation, walkways, skylights, and solar energy systems are exempt from the requirements of Table R402.6.

**TABLE R402.6
MINIMUM ROOF REFLECTANCE AND EMITTANCE OPTIONS**

Three-year-aged solar reflectance index (SRI) of 64
Three-year-aged solar reflectance of 0.55 and a three-year aged thermal emittance of 0.75

(f) Section R403.5.1.1.1, Demand recirculation water systems, is amended to read as follows:

R403.5.1.1.1 Demand recirculation water systems. Demand recirculation water systems are required when the length of hot water supply piping from the source of hot water to the furthest fixture fitting exceeds the specified length in Table R403.5.1.1.1. Where the piping contains more than one size of pipe, the largest size of pipe within the piping shall be used for determining the maximum allowable length of piping before a recirculating hot water system is required. For the purpose of this section, the source of hot water shall be a water heater, boiler, circulation loop piping, distribution manifold, or heat-traced piping.

Demand recirculation water systems shall have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance or sensing the flow of hot or tempered water to a fixture fitting or appliance.

Table R403.5.1.1.1 DEMAND RECIRCULATION WATER SYSTEM REQUIREMENT BASED ON PIPE SIZE AND LENGTH	
Nominal Pipe Size (inches)	Piping Length (feet)
3/8 inch line or less	> 50 feet
1/2 inch line	> 43 feet
5/8 inch line	> 32 feet
3/4 inch line	> 21 feet

(g) A new Section R404.4, Electric Vehicle (EV) charging infrastructure, is added as follows:

R404.4 Electric Vehicle (EV) charging infrastructure. New construction shall accommodate future installation and use of *Electric Vehicle Supply Equipment (EVSE)* in accordance with the *National Electrical Code (NFPA 70)*.

R404.4.1 EV capable charging. The main electrical service panel shall have a reserved space to allow installation of a full size 2-pole circuit breaker for future EV charging and shall be labeled "Future EV Charging". Where the electrical service panel is located beyond the perimeter of the garage wall, a raceway shall be installed from the electrical service panel to a location within the garage, where it shall terminate in a junction box or outlet and be labeled "Future EV Charging".

Where resident parking is provided in a common parking area in lieu of individual *dwelling unit* garages or carports, EV charging infrastructure shall comply with Section C405.13.

(h) Table R405.2, Requirements for Total Building Performance – Building Thermal Envelope and Electrical Power and Lighting Systems, are revised by adding a new line for Sections R402.6 and R404.4 as follows:

**TABLE R405.2
REQUIREMENTS FOR TOTAL BUILDING PERFORMANCE**

Building Thermal Envelope	
R402.6	Roof solar reflectance and thermal emittance
Electrical Power and Lighting Systems	
R404.4	Electric vehicle charging infrastructure

(i) Table R406.2, Requirements for Energy Rating Index – Building Thermal Envelope and Electrical Power and Lighting Systems, are revised by adding a new line for Sections R402.6 and R404.4 as follows:

**TABLE R406.2
REQUIREMENTS FOR ENERGY RATING INDEX**

Building Thermal Envelope	
R402.6	Roof solar reflectance and thermal emittance
Electrical Power and Lighting Systems	
R404.4	Electric vehicle charging infrastructure

(j) Section R408.2, Additional efficiency package options, is amended to read as follows:

R408.2 Additional efficiency package options. Additional efficiency package options for compliance with Section R401.2.1 are set forth in Sections R408.2.1 through R408.2.6.

(k) A new Section R408.2.6, On-site renewable energy option, is added as follows:

R408.2.6 On-site renewable energy option. Provide an on-site renewable energy generation system that meets one of the following:

1. Provides a total rated capacity of not less than 2 watts per square foot (22 W/m²) of the total *conditioned floor area*.
2. Provides not less than 50 percent of the estimated annual energy use within the building for mechanical, service water-heating, lighting and electric vehicle charging.

DIVISION. 3. ADOPTION AND AMENDMENTS TO IECC: APPENDICES

Sec. 31-117. Appendices to IECC.

The following appendices are adopted:

APPENDIX CB – SOLAR-READY ZONE - COMMERCIAL

APPENDIX RB – SOLAR-READY PROVISIONS – DETACHED ONE- AND TWO-FAMILY DWELLINGS AND TOWNHOUSES

Sec. 31-118. IECC Amendments – Appendix CB (Commercial).

Only the following portion of APPENDIX CB SOLAR-READY ZONE of the IECC is amended.

(a) *Section CB103.1, General, is amended to read as follows:*

CB103.1 General. A solar-ready zone shall be located on the roof of buildings that are oriented between 110 degrees and 270 degrees of true north or have low-slope roofs. Solar-ready zones shall comply with Sections CB103.2 through CB103.9.

Exceptions:

1. A building with a permanently installed, on-site renewable energy system.
2. A building with a solar-ready zone that is shaded for more than 70 percent of daylight hours annually.
3. A building where the licensed design professional certifies that the solar zone area required by Section CB103.3 cannot be met because of extensive rooftop equipment, skylights, vegetative roof areas or other obstructions.

Sec. 31-119. IECC Amendments – Appendix RB (Residential)

Only the following portion of APPENDIX RB SOLAR-READY PROVISIONS of the IECC is amended.

(a) *Section RB103.3, Solar-ready zone area, is amended to read as follows:*

RB103.3 Solar-ready zone area. The total solar-ready zone area shall be not less than 10 percent of the total roof area over *conditioned space* but not less than 300 sq. ft. (27.87 m²), exclusive of areas covered by skylights, occupied roof decks, vegetative roof areas and mandatory access or setback areas as required by the *International Fire Code*. New 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 (185.8 m²) per dwelling shall have a solar-ready zone area of not less than 150 square feet (13.94 m²). The solar-ready zone shall be composed of areas not less than 5 feet (1524 mm) in width and not less than 80 square feet (7.44 m²) exclusive of access or setback areas as required by the *International Fire Code*.