

**Section 17.42.070 Additional Regulations for Solar Energy Systems**

- A. **Purpose.** The purpose of these regulations is to preserve the health, safety, welfare, and harmonious development of the community by providing opportunities for the installation and use of safe and effective solar energy systems.
- B. **Applicability.** This Section applies to all solar energy system installations within the City of Columbia's zoning jurisdiction.
- C. **Definitions.** As used in this Section, the following terms shall be defined as indicated.

**AGRIVOLTAICS:** A solar energy system co-located on the same parcel of land as agricultural production, including crop production, grazing, apiaries, or other agricultural products or services.

**BUILDING-INTEGRATED SOLAR ENERGY SYSTEM:** A solar energy system that is an integral part of a principal or accessory building, rather than a separate mechanical device, replacing or substituting for an architectural or structural component of the building. Building-integrated systems include, but are not limited to, photovoltaic or hot water solar energy systems that are contained within roofing materials, windows, skylights, and awnings.

**BUILDING OFFICIAL:** The individual appointed by the Mayor of the City of Columbia to fill the role of Building Official with responsibility over administration and enforcement of the Building Code, including individuals designated and authorized to act on behalf of the Building Official.

**CORPORATE AUTHORITIES:** The Mayor and City Council of the City of Columbia.

**GRID-INTERTIE SOLAR ENERGY SYSTEM:** A photovoltaic solar energy system that is electrically connected to an electric circuit served by an electric utility company.

**GROUND-MOUNTED SOLAR ENERGY SYSTEM:** A solar energy system mounted on a rack or pole that rests on or is attached to the ground.

**LARGE-SCALE SOLAR ENERGY SYSTEM:** A ground-mounted photovoltaic solar energy system that generates electricity primarily to serve off-site demand. This may include retail sale direct to end users, wholesale sale to one or more electric utility, or generation by an electric utility for sale to its own retail or wholesale customers. Such a system is considered the primary use of the site on which it is located.

**NET METERING:** The measurement of the net amount of electricity supplied to an eligible customer by an electric provider/utility during a given billing period, after accounting for the amount of solar-generated electricity supplied to the provider/utility by said customer.

**PASSIVE SOLAR ENERGY SYSTEM:** A solar energy system that captures solar light or heat without transforming it to another form of energy or transferring the energy via a heat exchanger.

**PHOTOVOLTAIC SOLAR ENERGY SYSTEM:** A solar energy system that converts solar energy directly into electricity.

**OFF-GRID SOLAR ENERGY SYSTEM:** A photovoltaic solar energy system that is not electrically connected to electric circuits served by an electric utility company.

**QUALIFIED DESIGN PROFESSIONAL:** An individual licensed and authorized by the State of Illinois to practice as a design professional, such as engineer or architect, according to the scope of practice and standards established by the State for a specific design profession.

**ROOF (FLAT):** A roof that slopes at an angle less than 10 degrees, relative to the horizon. This angle may also be expressed as a 1:6 grade ratio or a 17.633% grade.

**ROOF (PITCHED):** A roof that slopes at an angle of 10 degrees or greater, relative to the horizon. This angle may also be expressed as a 1:6 grade ratio or a 17.633% grade.

**ROOF-MOUNTED SOLAR ENERGY SYSTEM:** A solar energy system mounted on a rack that is fastened to or ballasted on a structure roof.

**SMALL-SCALE SOLAR ENERGY SYSTEM:** A ground-mounted photovoltaic solar energy system that generates electricity primarily to serve on-site demand. This shall include such systems connected to an electric utility solely for net-metering purposes.

**SOLAR ACCESS:** Unobstructed access to direct sunlight on a lot or building through the entire year, including access across adjacent parcel air rights, for the purpose of capturing direct sunlight to operate a solar energy system.

**SOLAR COLLECTOR:** A device, structure or a part of a device or structure for which the primary purpose is to transform solar radiant energy into thermal, mechanical, chemical, or electrical energy. The collector does not include frames, supports, or mounting hardware.

**SOLAR DAYLIGHTING:** Capturing and directing the visible light spectrum for use in illuminating interior building spaces in lieu of artificial lighting, usually by adding a device or design element to the building envelope.

**SOLAR ENERGY:** Radiant energy received from the sun that can be collected in the form of heat or light by a solar collector.

**SOLAR ENERGY SYSTEM:** A device, array of devices, or structural design feature, the purpose of which is to provide for generation or storage of electricity from sunlight, or the collection, storage and distribution of solar energy for space heating or cooling, daylight for interior lighting, or water heating.

**SOLAR HOT AIR SYSTEM:** A solar energy system that includes a solar collector to provide direct supplemental space heating by heating and re-circulating conditioned building air. The most efficient performance includes a solar collector to preheat air or supplement building space heating, typically using a vertically mounted collector on a south-facing wall.

**SOLAR HOT WATER SYSTEM:** A system that includes a solar collector and a heat exchanger that heats or preheats water for building heating systems or other hot water needs, including residential domestic hot water and hot water for commercial processes.

**SOLAR MOUNTING DEVICES:** Racking, frames, or other devices that allow the mounting of a solar collector onto a roof surface or the ground.

**SOLAR READY DESIGN:** The design and construction of a building that facilitates and makes feasible the installation of rooftop solar.

**SOLAR RESOURCE:** A view of the sun from a specific point on a lot or building that is not obscured by any vegetation, building, or object for a minimum of four hours between the hours of 9:00 AM and 3:00 PM Standard time on all days of the year, and can be measured in annual watts per square meter.

**TILT ANGLE:** The angle of orientation of a solar collector at a given time, with 0 degrees being parallel to the horizon (flat) and 90 degrees being perpendicular to the horizon (upright). Design tilt refers to the minimum and maximum tilt angles a specific collector is designed to achieve.

**ZONING ADMINISTRATOR:** The individual serving as the City of Columbia's Director of Community Development, who has responsibility over administration and enforcement of the Zoning Code, including individuals designated and authorized to act on behalf of the Zoning Administrator.

**D. Reference Table of Zoning Permissions by District & System Type**

Type of Solar Energy System	Zoning District				Regulated as Primary or Accessory Structure
	Agricultural A-1	Residential R-1 thru R-7	Commercial C-1, C-2, C-3, BP-1, BP-2, OP, CP	Industrial I-1	
<b>Building-mounted or Building-integrated Systems</b>					
Property w/full zoning compliance	●	●	●	●	NA
Property w/legal non-conforming status	■	■	■	■	NA
Property w/illegal zoning status	✘	✘	✘	✘	NA
<b>Ground-mounted Systems</b>					
Small-scale System	■	■	■	■	A
Large-scale System	■	✘	✘	■	P
● = Allowed By-right ■ = Permitted as Special Use ✘ = Prohibited P = Primary A = Accessory NA = Not Applicable					

**E. General Provisions.** All solar energy systems shall comply with applicable requirements of this Subsection, except as otherwise provided in this Section.

1. No solar energy system or component thereof shall be installed without the applicable building, electrical, plumbing and other required permit(s) issued by the Building Official.
2. Solar energy systems, including all componentry and utility system connections, shall fully comply with all applicable provisions of the Building Code in effect at the time of application, including all regulated trade components, such as plumbing, electrical, etc.
3. No building permit shall be issued for a solar energy system without an approved site plan prepared and submitted in accordance with Building Code Section 15.04.032 *Site Plan Requirements*.
4. The applicant shall be responsible for obtaining approval from their homeowners' association (HOA) or similar entity, if applicable. However, no HOA or similar entity shall be entitled to deny the installation of a City-approved solar energy system, unless said entity fully complies with the Homeowners' Energy Policy Statement Act (765 ILCS 165). In such circumstances, the HOA or other applicable entity shall, upon request of the applicant or City, furnish a copy of the duly enacted policy statement demonstrating compliance with the Act.
5. Grid-intertie systems shall comply with the interconnection requirements of the applicable electric utility. Applicants shall notify the electric utility of the proposed interconnection and shall submit proof of notification to the Building Official prior to building permit issuance.
6. All electric solar energy system components shall have a UL or equivalent listing. Solar hot water systems must have an SRCC rating.
7. All interconnection conduits, cables and wiring between a grid-intertie system and an electric utility system shall be installed underground.
8. All solar energy systems using a reflector to enhance solar production shall minimize glare from the reflector affecting adjacent or nearby properties.

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9. A Certificate of Appropriateness issued by the Columbia Heritage & Preservation Commission shall be required prior to building permit issuance for all installations on a structure or property designated as a local, state, or national historic landmark.
- F. **Building-mounted & Building-integrated Systems.** Such systems mounted to, ballasted on, or integrated into an existing primary or accessory structure on any lot shall be considered a component of said building or structure when installed, maintained, and used in accordance with this Subsection.
1. Building-mounted or building-integrated installations shall only serve structures located on the same lot or parcel as the solar energy system. This shall not be construed as to prohibit net-metering connections.
  2. No building permit for such system installations shall be issued without first verifying and receiving the required zoning approvals, as determined by the Zoning Administrator. Such determinations shall be made in accordance with the following provisions.
    - a. Such systems shall be allowed as a matter-of-right in all zoning districts and shall require no further zoning approvals when:
      - i. The subject property, including all land uses, structures, and site conditions existing on said property, fully complies with applicable zoning regulations.
      - ii. A valid special use permit has been issued for the subject property, if applicable, and the land uses, structures, and site conditions existing on said property are in full compliance thereof.
    - b. Such systems shall be allowed only by way of special use permit approved per Chapter 17.40 *Special Uses* when:
      - i. The subject property, or any land use, structure, or site condition existing on said property, has legal noncompliant zoning status.
      - ii. A valid special use permit has been issued for the subject property, if applicable, and the land uses, structures, or site conditions existing on said property are not fully compliant with the conditions of the issued permit.
    - c. No such systems shall be allowed and no building permit shall be issued when the subject property, or any land use, structure, or site condition existing on said property, has illegal or noncompliant zoning status.
  3. All mounting surfaces, framing, and structural components of the primary building and all system structural components, frames, brackets, ballasting, fasteners, hardware, etc. shall be structurally sufficient, as determined by the Building Official.
    - a. This shall account for localized wind/ice/snow loading according to standard professional practices for structural design.
    - b. The Building Official may require submittal of any drawings, specifications, or other documentation necessary to demonstrate structural sufficiency, which shall be prepared by a qualified design professional.
  4. In addition to the required site plan, colored elevation drawings shall be submitted with the building permit application, which depict each building elevation upon which system components will be installed.

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5. The finished height of such systems shall not exceed the maximum allowed height of the applicable zoning district, when oriented at maximum tilt.
6. Aesthetic considerations shall be provided as follows.
  - a. **Exterior Walls.** The following shall apply to system componentry installed on or integrated into exterior walls:
    - i. No components shall be allowed on the front façade of any building. For buildings on corner lots, no components shall be allowed on a side wall that faces a public street, except where determined by the Building Official to be the only feasible location.
    - ii. No component shall project more than 12 inches perpendicular from the wall surface, except that awnings with integrated solar collectors may project no more than 4 feet 6 inches perpendicular from the wall surface.
    - iii. No component shall extend vertically above the wall's top edge or extend horizontally beyond the wall's side edge or corner.
  - b. **Pitched Roofs.** The following shall apply to system componentry installed on or integrated into pitched roofs:
    - i. Solar collectors and other components shall be allowed on any face of a roof, as needed to maximize solar access, but shall be mounted flush to the roof surface and at the same finished pitch.
    - ii. No component shall project more than 12 inches perpendicular from the roof surface.
    - iii. No component shall extend above the peak of the roof or overhang any edge of the roof.
  - c. **Flat Roofs.** The following shall apply to system componentry installed on or integrated into flat roofs:
    - i. Such components shall be exempt from any screening requirements applicable to rooftop equipment or mechanical systems. Solar collectors, including frames, racking, and other mounting components, may be used to screen other rooftop equipment when such screening is required.
    - ii. No component shall project more than 5 feet perpendicular from the finished roof surface.
    - iii. No component shall overhang any edge of the roof, except for conduits, cables, or wiring routed over a roof edge when determined by the Building Official to be the only feasible routing option.
- G. **Ground-mounted Solar Energy Systems.** Two types of ground-mounted solar energy systems defined above in Subsection C *Definitions* are regulated herein: Small-scale and Large-scale. All such systems shall require a special use permit approved per the process described in Chapter 17.40 *Special Uses* and shall be installed, maintained, and used in accordance with this Subsection.
  1. **Requirements for All Ground-mounted Installations.** The following general provisions shall apply to both small-scale and large-scale ground-mounted solar energy systems, except when in conflict with a more restrictive standard.

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- a. **Maximum Height at Maximum Design Tilt.** 15 feet, as measured from the adjacent finished grade.
  - b. **Lot Coverage.** Lot coverage, where applicable, shall be calculated based on the area covered at the minimum design tilt angle.
  - c. **Solar Access.** No system shall be approved that interferes with the solar access of an existing solar energy system installed on another property.
  - d. **Aviation Protection.** All systems proposed within 500 feet of an airport or within an airport approach zone shall submit a glare analysis prepared by a qualified design professional, in accordance with current guidance adopted by the Federal Aviation Administration (FAA).
2. **Small-scale Solar Energy Systems.** Such systems shall be considered accessory structures that require special use permit approval. Special use approval may be granted in conjunction with any allowable primary use in any zoning district, subject to applicable zoning district standards. In addition to the above Subsection E *General Provisions* and Subsection F.1 *Requirements for All Ground-Mounted Installations*, the following provisions shall apply to small-scale systems:
- a. **Minimum Setbacks at Minimum Design Tilt.** Where the applicable zoning district is less restrictive, the following minimum setbacks shall apply: 15 feet from any other structure; 80 feet from state or federal highway rights-of-way; 60 feet from other public street rights-of-way; 15 feet from any property boundary that is not a right-of-way line.
  - b. No such system shall be installed on a lot or parcel other than the same lot or parcel on which the primary structure is located.
  - c. No such system shall be installed in or encroach into the front yard of any lot.
  - d. No such system shall be installed in or encroach into a side yard of any lot, except when adequate solar access cannot be provided elsewhere as determined by a qualified design professional. A finding of fact supporting the solar access determination shall accompany such special use approvals.
  - e. All ground-mounted equipment shall be installed in a single grouping within a clearly defined and delineated area, subject to the following provisions:
    - i. The system shall be enclosed by a gated fence between 4 feet and 6 feet in height, encompassing the perimeter of the installation.
    - ii. The enclosed installation area shall not be paved, graveled, or otherwise covered by an impervious surface material of any type, except in locations where such conditions existed prior to installation.
  - f. Such systems shall not count against maximum lot/yard coverage requirements or limitations on the number of allowed accessory structures. However, the total enclosed installation area shall not exceed 50% of the area encompassed by the primary structure's footprint.

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3. **Large-scale Solar Energy Systems.** Such systems shall be considered primary land uses allowed only by special use permit in the A-1 Agricultural and I-1 Light Industrial zoning districts. In addition to the above Subsection E *General Provisions* and Subsection F.1 *Requirements for All Ground-Mounted Installations*, the following provisions shall apply to large-scale systems:
- a. **Minimum Lot Size.** 20 acres.
  - b. **Minimum Setbacks at Minimum Design Tilt.** A minimum front yard setback of 100 feet shall be required. Minimum side and rear yard setbacks shall be 75 feet from properties zoned for residential uses (R-1 through R-7) and 35 feet from properties zoned for non-residential uses.
  - c. **Screening.** An opaque screening fence at least 6 feet in height shall be installed along all property boundaries shared with a residential zoning district (R-1 through R-7). Tight landscape screening may be approved in lieu of screening fence, subject to submittal of a landscape plan, when such affords equal screening. A finding of fact supporting the landscape screening shall accompany such special use approvals.
  - d. **Fencing.** The entire project site shall be secured with a perimeter fence at least 6 feet in height. Barbed wire and woven wire fencing shall be prohibited. Where applicable adjacent to residential zoning, screening fencing may be used to satisfy this requirement.
  - e. **Vegetation & Ground Cover.** Ground cover shall be installed and maintained consistent with the *Pollinator-Friendly Solar Site Act* (525 ILCS 55/1) and related guidance published by the Illinois Department of Natural Resources (IDNR).
    - i. The site plan shall include a vegetation management plan adhering to the pollinator-friendly scorecard published by IDNR.
    - ii. Pollinator-friendly standards and scorecard shall be maintained for the duration of facility operations, until the site is decommissioned.
    - iii. The City may require an inspection fee at the time of the initial permit application to support ongoing inspection activities.
    - iv. The applicant shall submit a financial guarantee in the form of a letter of credit, cash deposit or bond in favor of the City of Columbia equal to 125% of the costs of meeting the pollinator-friendly standards. The financial guarantee shall remain in effect until vegetation is sufficiently established, as determined by the Building Official. City of Columbia corporate authorities shall reserve the right to accept or reject the choice of financial institution providing said guarantee.
    - v. Plant materials shall not have been treated with systemic insecticides, particularly neonicotinoids.
    - vi. Solar collectors that are constructed and maintained in compliance with these provisions shall not be considered impervious surfaces for the City's stormwater management regulations, erosion control provisions, or NPDES permit requirements.

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- f. **Agricultural Protection.** Commercial systems shall comply with site assessment or soil identification standards that are intended to identify agricultural soils, including submitting an Agricultural Impact Mitigation Plan (AIMP) to the City and the Illinois Department Agriculture, as required by the *Renewable Energy Facilities Agricultural Impact Mitigation Act* (505 ILCS 147/1, et seq.). The City may require mitigation of prime soils for solar projects, including the following:
- i. Demonstrating co-location with agricultural uses on the project site.
  - ii. Approving the special use for a limited time to allow the site to be returned to agricultural use upon end of life or decommissioning.
  - iii. Protecting prime soils with agricultural conservation easements on an equivalent number of acres in the vicinity.
  - iv. Locating the project in a wellhead protection area to remove agricultural uses from high-risk recharge areas.
- g. **Decommissioning.** The decommissioning plan required as part of the AIMP shall be prepared and submitted as part of the AIMP, which shall:
- i. Require system decommissioning in the event the project is not in use for 12 consecutive months.
  - ii. Include provisions for removal of all structures and foundations, restoration of soil and vegetation, and consistency with all standards of the AIMP.
  - iii. Disposal of structures and foundations shall meet applicable provisions of the Columbia Municipal Code.
  - iv. Provide assurances consistent with the Illinois Department of Agriculture's standard agricultural impact mitigation agreement.
  - v. The applicant shall submit a financial guarantee in the form of a letter of credit, cash deposit or bond in favor of the City of Columbia equal to 125% of the costs of decommissioning the site. The financial guarantee shall remain in effect until the site is fully decommissioned and restored in compliance with the approved AIMP. City of Columbia corporate authorities shall reserve the right to accept or reject the choice of financial institution providing said guarantee.