

7800 Solar Energy Systems – Small-Scale Ground-Mounted and Roof-Mounted

7801 Purpose

To facilitate and provide reasonable regulations for the placement, design, construction, operation, monitoring, modification, removal and recycling of Small-Scale Ground-Mounted and Roof-Mounted Solar Energy Systems that address public health, safety and welfare in accordance with Massachusetts General Law Chapter 40A, Section 3, minimizes impacts on scenic, rural, natural and historic community resources, and provides adequate financial assurance for the eventual decommissioning of such installations.

7802 Applicability

This section shall apply to all Small-Scale Ground-Mounted and Roof-Mounted Solar Energy Systems, including related buildings, structures, and equipment, and to physical modifications of such installations that materially alter their type, configuration, or size as determined by the Planning Board.

Roof-Mounted Solar Energy Systems do not trigger Site Plan Review.

Small-Scale Ground-Mounted Solar Energy Systems do not trigger Site Plan Review unless the proposed Solar Energy System is a) located in a residential district *and* b) requires placement in the front or side yard due an inability to site said Solar Energy System in the rear yard. Pre-existing, non-conforming installations are not subject to Site Plan Review unless they are substantially altered. Pre-existing, non-conforming installations shall not increase in square footage.

Small-Scale Ground-Mounted and Roof-Mounted Solar Energy Systems, however, will be reviewed as part of an application triggering Site Plan Review. For reference to Site Plan Review Application Policy and Procedures, applicants shall refer to the Site Plan Review Provision documents as follows:

- “Site Plan Review provisions for *Small-Scale Ground-Mounted and Roof-Mounted Solar Energy Systems*”

7803 Solar Energy System Definitions

7803.1 Ground-Mounted shall mean that installations are structurally mounted to the ground in any manner, including but not limited to ground anchored pole, rack, or rail installations, or non-ground penetrating ballasted installations; not roof-mounted installations or canopy installations above parking lots or driveways.

7803.2 Solar Collector shall mean 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.

7803.3 Solar Energy shall mean radiant energy received from the sun that can be collected in the form of heat or light by a Solar Collector.

- 7803.4 Solar Energy System shall mean a device or structural design feature, whose primary purpose is to harvest energy by transforming solar energy into another form of energy or transferring heat from a Solar Collector to another medium using mechanical, electrical, or chemical means such as to provide daylight for interior lighting or provide for the collection, storage and distribution of solar energy for space heating or cooling, electricity generation, or water heating.
- 7803.5 Solar Energy System, Ground-Mounted shall mean a Solar Energy System of any size that is structurally mounted to the ground in any manner, including but not limited to ground anchored pole, rack, or rail installations, or non-ground penetrating ballasted installations; not roof-mounted installations or canopy installations above parking lots or driveways.
- 7803.6 Solar Energy System, Roof-Mounted shall mean a Solar Energy System that is structurally mounted to the roof of a building or structure; may be of any size (small-, medium- or large-scale).
- 7803.7 Solar Energy System, Small-Scale Ground-Mounted shall mean a Solar Energy System with a Solar Layout of 2,250 square feet or less. Inclusive of appurtenant structures.
- 7803.8 Solar Layout shall mean the total area of the vertical projection on the ground of all Solar Collectors in the installation's most horizontal tilt position.
- 7803.9 Utility Provider shall mean the local electrical distribution company (Littleton Electric Light Department (LELD) or other).

7804 Standards and Requirements

The following provisions shall apply to all Small-Scale Ground-Mounted and Roof-Mounted Solar Energy Systems in zoning districts where they are a permitted use.

(1) Setbacks

The Solar Layout of a Small-Scale Ground-Mounted Solar Energy System and Roof-Mounted Solar Layouts of an installation along with appurtenant structures, including but not limited to: buildings, equipment shelters, storage facilities, transformers and substations shall comply with the building setbacks for front, side and rear yard requirements of the zoning district in which it is located, except for power feed and distribution lines and equipment where underground installation is not possible.

All Small-Scale Ground-Mounted Solar Energy Systems in residential districts shall be installed in the rear yard to the greatest extent practicable. Placement of Ground-Mounted Solar Energy Systems in front or side yards is allowed only upon demonstration that locating the Solar Energy System within the rear yard is not practicable and shall require site plan approval.

(2) Landscaping and Screening

Additional screening is not required for Small-Scale Ground-Mounted Solar Energy Systems so long as said systems are sited in the rear yard and property setbacks for the rear and side yard are maintained in a naturally vegetated state, such as a forested condition or equivalent.

(3) Protection of Forest Land and Prime Farm Land, Land Clearing, Soil Erosion and Habitat Impacts

Not more than one (1) acre of land shall be deforested for any one Solar Energy Systems, and no such installation shall be placed on such land that was deforested within the prior 5 years. Clearing of natural vegetation shall be limited to what is necessary for the construction, operation and maintenance of the Solar Energy System or otherwise prescribed by applicable laws, regulations, and bylaws/ordinances.

Small-Scale Ground-Mounted Solar Energy Systems are prohibited in locations of old growth forest, prime farmland soils, wetlands, aquifer districts, permanently protected open space, Priority Habitat Areas and BioMap 2 Critical Natural Landscape Core Habitat as mapped by the Natural Heritage & Endangered Species Program (NHESP) and Habitat of Potential Regional or Statewide Importance as mapped by the Department of Environmental Protection (DEP).

(4) Decommissioning

Upon decommissioning of Solar Energy Systems all solar panel components shall be reused or recycled using industry best practices available at the time of decommissioning.

(5) Height Limitations

Existing zoning district height limitations apply for all Ground-Mounted Solar Energy Systems. If the Ground-Mounted Solar Energy System is accessory to a principal building or structure on a lot, then the height restriction for accessory structures would apply as defined in Section 5008 of this Bylaw. If the Ground-Mounted Solar Energy System is the principal structure on a lot, then the height restriction shall be a maximum of twenty (20) feet from finished grade. An increase in height may be granted in commercial districts by special permit.

4003(4): Business/ Industrial Uses – continued

	AR	R1	B	B1	OP	TC	IC
Roof-Mounted Solar Energy Systems	Y	Y	Y ¹⁹	Y ¹⁹	Y	Y ¹⁹	Y
Small-Scale Ground-Mounted Solar Energy System (2,250 s.f. or less)	Y	Y	Y ¹⁹	Y ¹⁹	Y	N	Y

ARTICLE IV USE REGULATIONS

ARTICLE V DIMENSIONAL REQUIREMENTS
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FOOTNOTES – **continued**

¹⁹ Proposed Solar Energy Systems shall be required to undergo Design Review Board review and shall adopt as practicable, recommendations made. Solar Energy Systems on historically significant structures shall have limited or no visibility to the public on said structures and the Boards reserve the right to recommend specific solar energy systems to maintain historical character of structures.

DRAFT

7800 Solar Energy Systems – Medium and Large-Scale Ground-Mounted

7801 Purpose

To facilitate and provide reasonable regulations for the placement, design, construction, operation, monitoring, modification, removal and recycling of Medium and Large-Scale Ground-Mounted Solar Energy Systems that address public health, safety and welfare in accordance with Massachusetts General Law Chapter 40A, Section 3, minimizes impacts on scenic, rural, natural and historic community resources, and provides adequate financial assurance for the eventual decommissioning of such installations.

7802 Applicability

This section shall apply to all Medium and Large-Scale Ground Mounted Solar Energy Systems, including related buildings, structures, and equipment, and to physical modifications of such installations that materially alter their type, configuration, or size as determined by the Planning Board.

Site Plan Review shall be triggered by Medium and Large-Scale Ground-Mounted Solar Energy System Installations. For reference to Site Plan Review Application Policy and Procedures, applicants shall refer to the Site Plan Review Provision documents as follows:

- “Site Plan Review provisions for *Medium-Scale Ground-Mounted Solar Energy Systems*”
- “Site Plan Review provisions for *Large-Scale Ground-Mounted Solar Energy Systems*”

7803 Solar Energy System Definitions

7803.1 Agrioltaics or Dual Use shall mean the co-developing of the same area of land for both solar photovoltaic power as well as for agriculture. The coexistence of solar panels and crops implies a sharing of light between these two types of production.

7803.2 Ground-Mounted shall mean that installations are structurally mounted to the ground in any manner, including but not limited to ground anchored pole, rack, or rail installations, or non-ground penetrating ballasted installations; not roof-mounted installations or canopy installations above parking lots or driveways.

7803.3 Solar Energy shall mean radiant energy received from the sun that can be collected in the form of heat or light by a solar collector.

7803.4 Solar Energy System shall mean a device or structural design feature, whose primary purpose is to harvest energy by transforming solar energy into another form of energy or transferring heat from a collector to another medium using mechanical, electrical, or chemical means such as to provide daylight for interior lighting or provide for the collection, storage and distribution of solar energy for space heating or cooling, electricity generation, or water heating.

- 7803.5 Solar Energy System, Ground-Mounted shall mean a Solar Energy System of any size that is structurally mounted to the ground in any manner, including but not limited to ground anchored pole, rack, or rail installations, or non-ground penetrating ballasted installations; not roof-mounted installations or canopy installations above parking lots or driveways.
- 7803.6 Solar Energy System, Large-Scale Ground-Mounted shall be considered an industrial facility use and mean a Solar Energy System with a Solar Layout that occupies more than 40,000 square feet of surface area. Inclusive of appurtenant structures.
- 7803.7 Solar Energy System, Medium-Scale Ground-Mounted shall be considered an industrial facility use and mean a Solar Energy System with a Solar Layout that occupies more than 1,750 but less than 40,000 square feet of surface area. Inclusive of appurtenant structures.
- 7803.8 Solar Layout shall mean the total area of the vertical projection on the ground of all panels in the installation's most horizontal tilt position and shall include all spaces between the panels.
- 7803.9 Utility Provider shall mean the local electrical distribution company (Littleton Electric Light Department (LELD) or other).

7804 Standards and Requirements

The following provisions shall apply to all Medium-Scale and Large-Scale Ground-Mounted Solar Energy Systems in zoning districts where they are a permitted use.

(1) Setbacks

The Solar Layouts of Medium-Scale or Large-Scale Ground-Mounted Solar Energy Systems, along with all appurtenant structures, including but not limited to: buildings equipment shelters, storage facilities, transformers and substations shall adhere to a one hundred (100) foot front, side and rear yard setback requirement in all zoning districts. The Planning Board may reduce setbacks from lot lines for the Solar Layout of a Medium-Scale Ground-Mounted Solar Energy System of 5,000 square feet or less if such adjustments enhance the overall site design and still provide protection to adjacent properties. In such a case, additional screening may be required to minimize adverse impacts.

Any Medium-Scale Ground-Mounted Solar Energy Systems allowed by Special Permit within residential districts shall be installed in the rear yard.

(2) Landscaping and Screening

All appurtenant structures, including but not limited to: buildings, equipment shelters, storage facilities, transformers, and substations shall be architecturally compatible with each other. All structures shall be hidden from view by vegetation or fencing and shall be in place prior to operation. Landscape plantings and/or solid fenced screening shall be provided to reduce

the visual impact of Ground-Mounted Solar Energy Systems, along with all appurtenant structures, and specifically to protect nearby receptors from danger, harm, or nuisance that may result from reflective glare. Solar Energy Systems and all appurtenant structures shall have anti-reflective surfaces.

Front, side and rear yard setback areas shall be designed to reduce the visual impact of the Medium and Large-Scale Ground-Mounted Solar Energy System upon adjacent property by use of trees and shrubs and/or naturally vegetated conditions or fencing. Where naturally vegetated conditions are insufficient to reduce visual impacts year-round, landscape plantings for Medium and Large-Scale Ground-Mounted Solar Energy Systems shall consist of a sight-impervious screen of evergreen foliage not less than eight (8) feet in height. Suitable landscape plantings shall consist of native species identified by the UMass Clean Energy Extension Pollinator-Friendly Solar PV for Massachusetts initiative.

Should fencing be used, it shall be no more than eight feet high, constructed of durable materials and supplemented with landscape plantings, as defined above. Berms or other methods to adequately screen the facility, depending on site specific conditions may be considered. All screening shall be maintained and replaced as necessary by the owner / operator of the Medium or Large-Scale Ground-Mounted Solar Energy System.

(3) Lighting

Lighting of Medium and Large-Scale Ground-Mounted Solar Energy Systems and appurtenant structures shall be limited to that required for safety and operational purposes, and shall be fully shielded from abutting properties. Lighting of the Medium or Large-Scale Ground-Mounted Solar Energy System shall be directed downward and shall incorporate full cut-off fixtures to reduce light pollution. Security lighting shall be controlled by motion detectors or infrared sensors with an on-time of no more than ten (10) minutes per activation. No all-night lighting will be allowed.

(4) Utility Connections

All utility connections, conduits, cables, power lines, transformers and inverters shall be placed underground, except (a) where otherwise required by the Massachusetts State Building Code, Massachusetts and/or National Electric Code, the Utility Provider or other authority having jurisdiction; (b) in adverse ground conditions such as appropriate soil conditions, shape and topography of the site, ledge or excess water; or (c) for connection to existing above ground utility lines. Wiring within the installation's Solar Layout shall follow industry standards and meet the requirements of the Utility Provider. Where an aboveground connection is already existing proximate to the site of the proposed facilities, it may be used, as determined by the Planning Board, if it meets the requirements of the Utility Provider, and electrical transformers for utility interconnections may be located above ground if required by the

Utility Provider. All noise-generating equipment shall be installed as far from abutting structures as practical to mitigate potential noise impacts. A pre and post-construction noise study shall be required of all Large-Scale Ground-Mounted Solar Energy System installations.

Where feasible all access roads and utilities shall minimize bisecting of the property and be installed along the perimeter of project. Access roads and associated tree clearing shall not exceed twenty-five (25) feet in width.

(5) Signs

Signs shall comply with the requirements of Section 6300 of this Bylaw. However, in the Residential Districts not more than one (1) sign, with dimensions no larger than one (1) square foot in area per side shall be required to identify the owner and provide a 24-hour emergency contact phone number and may be installed with the trademarks of the installer, manufacturer, and operator of the installation. Medium and Large-Scale Ground-Mounted Solar Energy Systems shall not be used for displaying any advertising except for reasonable identification of the manufacturer, owner or operator of the Solar Energy System. Signs should not be visible to abutters nor to passersby on the street, if it can still be visible for emergency purposes.

(6) Stormwater Management and Conservation

Best management practices shall be used for controlling and managing stormwater run-off and drainage for Medium and Large-Scale Ground-Mounted Solar Energy Systems in compliance with all applicable federal, state and local regulations. To the largest extent possible, the ground shall remain pervious to rain water. Where necessary, adequate provision shall be made for groundwater recharge and to prevent site run-off and erosion.

(7) Protection of Forest Land and Prime Farm Land, Land Clearing, Soil Erosion and Habitat Impacts

Not more than one (1) acre of land shall be deforested for any one Solar Energy System, and no such installation shall be placed on such land that was deforested within the prior 5 years. Clearing of natural vegetation shall be limited to what is necessary for the construction, operation and maintenance of the Solar Energy System or otherwise prescribed by applicable laws, regulations, and bylaws/ordinances.

Solar Energy Systems are prohibited in locations of old growth forest, prime farmland soils, wetlands, aquifer districts, permanently protected open space, Priority Habitat Areas and BioMap 2 Critical Natural Landscape Core Habitat mapped by the Natural Heritage & Endangered Species Program (NHESP) and "Important Wildlife Habitat" mapped by the DEP.

The Planning Board encourages siting of Solar Energy Systems in the following locations:

- Roof-mounted
- Brownfield sites
- Parking lots

Proposed greenfield development is discouraged. Applicants who propose greenfield installations will be required to demonstrate why the proposed site is preferable to a previously developed site. Such demonstration shall include a comparison of environmental impacts and a cost-benefit assessment.

(8) Height Limitations

Existing zoning district height limitations apply for all Ground-Mounted Solar Energy Systems. If the Ground-Mounted Solar Energy System is accessory to a principal building or structure on a lot, then the height restriction for accessory structures would apply as defined in Section 5008 of this Bylaw. If the Ground-Mounted Solar Energy System is the principal structure on a lot, then the height restriction shall be a maximum of twelve (12) feet from finished grade. An increase in height may be granted in commercial districts by special permit.

(9) Decommissioning

Upon decommissioning of Solar Energy Systems all solar panel components shall be reused or recycled using industry best practices available at the time of decommissioning. The applicant may be required, as deemed appropriate by the Planning Board, to demonstrate a life-cycle analysis of the components to ensure that there is a net environmental benefit to the proposed installation.

Proponents of Large-Scale Ground-Mounted Solar Energy Systems shall provide a form of surety, either through escrow account, bond or otherwise, to cover the cost of removal in the event the Town must remove the installation and remediate the landscape, in an amount and form determined to be reasonable by the Planning Board, but in no event to exceed more than 125% of the cost of removal and compliance with the additional requirements set forth herein, as determined by the project proponent. The project proponent shall submit a fully inclusive estimate of the costs associated with removal, prepared by a qualified engineer. The amount shall include a mechanism for calculating increased removal costs due to inflation.

7805 Exemptions from Zoning Requirements

Medium and Large-Scale Ground-Mounted Solar Energy Systems shall not be included in calculations for lot coverage or impervious cover so long as said installations have planted surfaces beneath them such as dual-use solar or agrivoltaics installations. If the area beneath a Medium or Large-Scale Ground-Mounted Solar Energy System is to be paved or otherwise rendered impervious then this land area shall in fact count toward any coverage or impervious surface limit. Land required for access roads, utility connections and appurtenant structures will be included in calculations for lot coverage or impervious cover of land.

4003(4): Business/ Industrial Uses – continued

	AR	R1	B	B1	OP	TC	IC
Medium-Scale Ground-Mounted Solar Energy System (greater than 1,750 but less than 40,000 s.f)	N	SP	Y ¹⁹	Y ¹⁹	Y	N	Y
Large-Scale Ground-Mounted Solar Energy System (40,000 s.f. or greater)	N	N	SP ¹⁹	SP ¹⁹	SP	N	SP

ARTICLE IV USE REGULATIONS

4XXX Special Permits for Medium or Large-Scale Ground Mounted Solar Energy Systems

The Planning Board shall be the Special Permit Granting Authority for the issuance of special permits in the case where an applicant requests to install a Medium or Large-Scale Ground-Mounted Solar Energy System. In addition to the standards set forth in Section 7800 of this Bylaw, the Special Permit Granting Authority shall also consider each of the following factors before the issuance of a special permit:

- (1) Suitability of the site for the proposed Medium or Large-Scale Ground-Mounted Solar Energy System;
- (2) Adequate landscaped and natural buffers are provided around the installation. Where applicable, physical buffers, such as berms, fences and/or walls are proposed between residential and installations of Medium or Large-Scale Ground-Mounted Solar Energy System;
- (3) The proposal, to the maximum extent possible, protects the existing tree canopy and stone walls on Massachusetts Avenue (Route 111) and along designated scenic roadways;
- (4) The proposal retains and/or preserves unique natural, historical or cultural resources located on the site, if any;

ARTICLE V DIMENSIONAL REQUIREMENTS

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FOOTNOTES – continued

¹⁹ Proposed Solar Energy Systems shall be required to undergo Design Review Board review and shall adopt as practicable, recommendations made. Solar Energy Systems on historically significant structures shall have limited or no visibility to the public on said structures and the Boards reserve the right to recommend specific solar energy systems to maintain historical character of structures.