

**Model As-of-Right Zoning Bylaw:  
Allowing Use of Large-Scale Ground-Mounted Solar Photovoltaic  
Installations**

Prepared by:  
Department of Energy Resources  
Massachusetts Executive Office of Environmental Affairs

December 2014

*This Model Bylaw was prepared to assist cities and towns in establishing reasonable standards to facilitate development of large-scale ground-mounted solar photovoltaic installations. The bylaw was developed as a model and is not intended for adoption without specific review by municipal counsel.*

**1.0 Purpose**

The purpose of this bylaw is to promote the creation of new large-scale ground-mounted solar photovoltaic installations by providing standards for the placement, design, construction, operation, monitoring, modification and removal of such installations that address public safety, minimize impacts on scenic, natural and historic resources and to provide adequate financial assurance for the eventual decommissioning of such installations.

The provisions set forth in this section shall apply to the construction, operation, and/or repair of large-scale ground-mounted solar photovoltaic installations.

**1.1 Applicability**

This section applies to large-scale ground-mounted solar photovoltaic installations proposed to be constructed after the effective date of this section. This section also pertains to physical modifications that materially alter the type, configuration, or size of these installations or related equipment.

***Qualifying as a Green Community:*** *In order to satisfy the Green Communities Act as-of-right zoning requirement a community's zoning must allow solar photovoltaic installations that utilize ground-mounted systems which individually have a rated name plate capacity of 250 kW (DC) or more.*

***Approximate size of installation:*** *A solar photovoltaic array with a rated name plate capacity of 250 kW (DC) occupies approximately one acre of land.*

***Smaller installations (under 250 kW):*** *The above requirement for qualification as a Green Community is not intended to discourage construction of solar photovoltaic installations that are smaller than 250 kW, but rather to ensure that in designated locations local regulatory barriers that may adversely affect large-scale ground-mounted projects are minimized.*

***Educational Note:*** Existing Massachusetts law largely exempts solar photovoltaic installations from local zoning restrictions. Massachusetts General Laws [Chapter 40A, Section 3](#), provides, in relevant part, that:

*No zoning ordinance or by-law shall prohibit or unreasonably regulate the installation of solar energy systems or the building of structures that facilitate the collection of solar energy, except where necessary to protect the public health, safety or welfare.*

*In view of M.G.L. ch. 40A § 3, local zoning provisions specifically allowing for the as-of-right construction of smaller solar energy systems – such as those commonly installed on top of or on the lot of a home or business—are unnecessary. However, it is not clear whether M.G.L. ch. 40A § 3 applies to the construction of large scale ground-mounted systems. Therefore, to qualify as a green community, a municipality may adopt a solar photovoltaic bylaw for as-of-right siting of large scale ground-mounted systems in a designated location(s). An existing example of a large scale ground-mounted solar photovoltaic system is the [Brockton Brightfields Project](#).*

## **2.0 Definitions**

**As-of-Right Siting:** As-of-Right Siting shall mean that development may proceed without the need for a special permit, variance, amendment, waiver, or other discretionary approval. As-of-right development may be subject to site plan review to determine conformance with local zoning ordinances or bylaws. Projects cannot be prohibited, but can be reasonably regulated by the inspector of buildings, building commissioner or local inspector, or if there is none in a town, the board of selectmen, or person or board designated by local ordinance or bylaw.

**Building Inspector:** The inspector of buildings, building commissioner, or local inspector, or person or board designated by local ordinance or bylaw charged with the enforcement of the zoning ordinance.

**Building Permit:** A construction permit issued by an authorized building inspector; the building permit evidences that the project is consistent with the state and federal building codes as well as local zoning bylaws, including those governing ground- mounted large-scale solar photovoltaic installations.

**Designated Location:** The location[s] designated by [the community’s local legislative body], in accordance with Massachusetts General Laws Chapter 40A, section 5, where ground - mounted large scale solar photovoltaic installations may be sited as-of right. Said location[s] [is/are] shown on a Zoning Map [insert title of map] pursuant to Massachusetts General Laws Chapter 40A Section 4. This map is hereby made a part of this Zoning Bylaw and is on file in the Office of the [Town/City] Clerk.

**Note:** The term “designated location” refers to the location within a community where solar photovoltaic installations are permitted as-of-right. Establishment of a designated location for such installations is an integral part of the process of adopting an as-of-right solar photovoltaic bylaw.

**Legal Requirements:** The process of designating the location must comport with the requirements of Massachusetts General Laws [Chapter 40A, Section 5](#), which sets out the requirements for adopting and amending zoning bylaws.

**Methods of Designating a Location:** Communities may designate locations by reference to geographically specific districts. In the alternative, communities may create an overlay district consisting of all or portions of multiple preexisting zoning districts, where large scale solar photovoltaic power generation is permitted by right. Because solar photovoltaic power generation produces neither adverse noise impacts nor harmful emissions, use of land for the purpose of solar photovoltaic power generation should be compatible with most other types of land usage. However DOER strongly discourages designating locations that require significant tree cutting, because of the important water management, cooling and climate benefits trees have. DOER encourages designating locations in industrial and commercial districts, or on vacant, disturbed land.

**Green Communities Program Requirements:** To qualify for designation as a Green Community, the designated location must provide a realistic and practical opportunity for development of a large scale solar photovoltaic power generation facility. In designating a location, it is important for the community implementing the as-of right zoning bylaw to consider the availability of sunlight and particular characteristics of the local community. It is not practical to site solar photovoltaic installations in areas that are surrounded by tall structures. The size of available lots is also a relevant consideration, though aggregation of contiguous parcels within a designated district in order to create a parcel of sufficient size to construct a qualifying facility will be considered. As previously mentioned, a solar photovoltaic array with a rated name plate capacity of 250 kW occupies approximately one acre of land.

**Large-Scale Ground-Mounted Solar Photovoltaic Installation:** A solar photovoltaic system that is structurally mounted on the ground and is not roof-mounted, and has a minimum nameplate capacity of 250 kW DC.

**On-Site Solar Photovoltaic Installation:** A solar photovoltaic installation that is constructed at a location where other uses of the underlying property occur.

**Rated Nameplate Capacity:** The maximum rated output of electric power production of the Photovoltaic system in Direct Current (DC).

**Site Plan Review:** review by the Site Plan Review Authority to determine conformance with local zoning ordinances or bylaws.

**Note:** In some communities this is known as Site Plan Approval rather than Site Plan Review. Regardless of which term is used by a community, the following excerpt from Lowe’s Home Centers, Inc. v. Town of Auburn Planning Board provides an excellent judicial explanation of the nature of site plan review as applied to as-of-right uses:

Site plan approval acts as a method for regulating as-of-right uses rather than prohibiting them as per Y.D. Dugout, Inc. v. Bd. Of Appeals of Canton, 357 Mass. 25, 31, 255 N.E.2d 732 (1970). When evaluating the Site Plan Applications, the Planning Board may not unconditionally deny the Site Plan Applications, but rather, it may impose reasonable conditions upon them. See Prudential, 23 Mass.App.Ct. at 281-82, 502 N.E.2d 137; Quincy, 39 Mass.App.Ct. at 21-22, 652 N.E.2d 901 (“[W]here the proposed use is one permitted by right the planning board may only apply substantive criteria ... i.e., it may impose reasonable terms and conditions on the proposed use, but it does not have the discretionary power to deny the use.”). Thus, when a site plan application is submitted for an as-of-right use, a planning board is obligated to grant an approval with reasonable conditions unless, “despite best efforts, no form of reasonable conditions [can] be devised to satisfy the problem with the plan....” Prudential, 23 Mass.App.Ct. at 283n. 9, 502 N.E.2d 137; Castle Hill Apartments Ltd.P’ship v. Planning Bd. Of Holyoke, 65 Mass.App.Ct. 840, 845-45, 844 N.E.2d 1098 (2006).

**Site Plan Review Authority:** For purposes of this bylaw, Site Plan Review Authority refers to the body of local government designated as such by the municipality

**Note:** The Site Plan Review Authority can be the Board of Selectman, City Council, Board of Appeals, Planning Board or Zoning Administrator. However, the Planning Board is typically the best group to serve in this capacity as it is usually the most familiar with the municipality’s zoning bylaws/ordinances as well as its Master Plan or other plans for future conservation/development.

**Zoning Enforcement Authority:** The person or board charged with enforcing the zoning ordinances or bylaws.

**Note:** By state statute, the Zoning Enforcement Authority may be the “inspector of buildings, building commissioner or local inspector, or if there are none, in a town, the board of selectmen, or person or board designated by local ordinance or by-law”. M.G.L. ch. 40A § 7. In many communities, the building inspector is the person charged with enforcing both the state’s building code and local zoning ordinances or bylaws.

### 3.0 General Requirements for all Large Scale Solar Power Generation Installations

The following requirements are common to all solar photovoltaic installations to be sited in designated locations.

### **3.1 Compliance with Laws, Ordinances and Regulations**

The construction and operation of all large scale solar photovoltaic installations shall be consistent with all applicable local, state and federal requirements, including but not limited to all applicable safety, construction, electrical, and communications requirements. All buildings and fixtures forming part of a solar photovoltaic installation shall be constructed in accordance with the State Building Code.

### **3.2 Building Permit and Building Inspection**

No large scale solar photovoltaic installation shall be constructed, installed or modified as provided in this section without first obtaining a building permit.

*Note: Under the state building code, work must commence within six (6) months from the date a building permit is issued; however, a project proponent may request an extension of the permit and more than one extension may be granted.*

### **3.3 Fees**

The application for a building permit for a large scale solar photovoltaic installation must be accompanied by the fee required for a building permit.

### **3.4 Site Plan Review**

Ground-mounted large scale solar photovoltaic installations with 250 kW or larger of rated nameplate capacity shall undergo site plan review by the Site Plan Review Authority prior to construction, installation or modification as provided in this section.

*Purpose: The purpose of the site plan review is to determine that the use complies with all requirements set forth in this zoning bylaw and that the site design conforms to established standards regarding landscaping, access, and other zoning provisions.*

*Additional Considerations: As part of the implementation of an as-of-right large-scale ground-mounted solar photovoltaic bylaw, communities should consider amending their existing site plan review provisions in order to incorporate site plan review conditions that apply specifically to such installations.*

#### **3.4.1 General**

All plans and maps shall be prepared, stamped and signed by a Professional Engineer licensed to practice in Massachusetts.

#### **3.4.2 Required Documents**

Pursuant to the site plan review process, the project proponent shall provide the following documents:

(a) A site plan showing:

- i. Property lines and physical features, including roads, for the project site;
- ii. Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures;

- iii. Blueprints or drawings of the solar photovoltaic installation signed by a Professional Engineer licensed to practice in the Commonwealth of Massachusetts showing the proposed layout of the system and any potential shading from nearby structures
  - iv. One or three line electrical diagram detailing the solar photovoltaic installation, associated components, and electrical interconnection methods, with all National Electrical Code compliant disconnects and overcurrent devices;
  - v. Documentation of the major system components to be used, including the PV panels, mounting system, and inverter;
  - vi. Name, address, and contact information for proposed system installer;
  - vii. Name, address, phone number and signature of the project proponent, as well as all co-proponents or property owners, if any;
  - viii. The name, contact information and signature of any agents representing the project proponent; and
- (b) Documentation of actual or prospective access and control of the project site (see also Section 3.5);
  - (c) An operation and maintenance plan (see also Section 3.6);
  - (d) Zoning district designation for the parcel(s) of land comprising the project site (submission of a copy of a zoning map with the parcel(s) identified is suitable for this purpose);
  - (e) Proof of liability insurance; and
  - (f) A public outreach plan, including a project development timeline, which indicates how the project proponent will meet the required site plan review notification procedures and otherwise inform abutters and the community

The Site Plan Review Authority may waive documentary requirements as it deems appropriate.

*Additional Consideration for Smaller Solar Photovoltaic Installations: The extensive site plan review documentation set forth in Section 3.4.2 of this model bylaw is not intended to apply to smaller solar photovoltaic installations. One of the key goals underpinning the Green Communities Program is the development of renewable and alternative energy generation. Communities should shape their bylaws to enable both large and small projects to proceed without undue delay.*

### **3.5 Site Control**

The project proponent shall submit documentation of actual or prospective access and control of the project site sufficient to allow for construction and operation of the proposed solar photovoltaic installation.

### **3.6 Operation & Maintenance Plan**

The project proponent shall submit a plan for the operation and maintenance of the large-scale ground-mounted solar photovoltaic installation, which shall include measures for

maintaining safe access to the installation, storm water controls, as well as general procedures for operational maintenance of the installation.

### **3.7 Utility Notification**

No large- scale ground –mounted solar photovoltaic installation shall be constructed until evidence has been given to the Site Plan Review Authority that the utility company that operates the electrical grid where the installation is to be located has been informed of the solar photovoltaic installation owner or operator’s intent to install an interconnected customer-owned generator. Off-grid systems shall be exempt from this requirement.

### **3.8 Dimension and Density Requirements**

#### **3.8.1 Setbacks**

For large - scale ground-mounted solar photovoltaic installations, front, side and rear setbacks shall be as follows:

- (a) Front yard: The front yard depth shall be at least 10 feet; provided, however, that where the lot abuts a Conservation-Recreation or Residential district, the front yard shall not be less than 50 feet.
- (b) Side yard. Each side yard shall have a depth at least 15 feet; provided, however, that where the lot abuts a Conservation-Recreation or Residential district, the side yard shall not be less than 50 feet.
- (c) Rear yard. The rear yard depth shall be at least 25 feet; provided, however, that where the lot abuts a Conservation-Recreation or Residential district, the rear yard shall not be less than 50 feet.

*Note: These setback distances are suggested values. Decreased setback distances may be appropriate. The municipality should evaluate what is appropriate for its designated location(s). Project developers may be encouraged to include screening vegetation along the borders of the site, to minimize the visual impact of the PV installation.*

#### **3.8.2 Appurtenant Structures**

All appurtenant structures to large- scale ground-mounted solar photovoltaic installations shall be subject to reasonable regulations concerning the bulk and height of structures, lot area, setbacks, open space, parking and building coverage requirements. All such appurtenant structures, including but not limited to, equipment shelters, storage facilities, transformers, and substations, shall be architecturally compatible with each other. Whenever reasonable, structures should be shaded from view by vegetation and/or joined or clustered to avoid adverse visual impacts.

*Note: Regulations governing appurtenant structures are typically contained in a town’s zoning ordinance or bylaw.*

### **3.9 Design Standards**

#### **3.9.1 Lighting**

Lighting of solar photovoltaic installations shall be consistent with local, state and federal law. Lighting of other parts of the installation, such as appurtenant structures, shall be limited to that required for safety and operational purposes, and shall be reasonably shielded from abutting properties. Where feasible, lighting of the solar photovoltaic installation shall be directed downward and shall incorporate full cut-off fixtures to reduce light pollution.

### **3.9.2 Signage**

Signs on large- scale ground-mounted solar photovoltaic installations shall comply with a municipality's sign bylaw. A sign consistent with a municipality's sign bylaw shall be required to identify the owner and provide a 24-hour emergency contact phone number.

Solar photovoltaic installations shall not be used for displaying any advertising except for reasonable identification of the manufacturer or operator of the solar photovoltaic installation.

### **3.9.3 Utility Connections**

Reasonable efforts, as determined by the Site Plan Review Authority, shall be made to place all utility connections from the solar photovoltaic installation underground, depending on appropriate soil conditions, shape, and topography of the site and any requirements of the utility provider. Electrical transformers for utility interconnections may be above ground if required by the utility provider.

## **3.10 Safety and Environmental Standards**

### **3.10.1 Emergency Services**

The large scale solar photovoltaic installation owner or operator shall provide a copy of the project summary, electrical schematic, and site plan to the local fire chief. Upon request the owner or operator shall cooperate with local emergency services in developing an emergency response plan. All means of shutting down the solar photovoltaic installation shall be clearly marked. The owner or operator shall identify a responsible person for public inquiries throughout the life of the installation.

### **3.10.2 Land Clearing, Soil Erosion and Habitat Impacts**

Clearing of natural vegetation shall be limited to what is necessary for the construction, operation and maintenance of the large – scale ground-mounted solar photovoltaic installation or otherwise prescribed by applicable laws, regulations, and bylaws.

## **3.11 Monitoring and Maintenance**

### **3.11.1 Solar Photovoltaic Installation Conditions**

The large - scale ground-mounted solar photovoltaic installation owner or operator shall maintain the facility in good condition. Maintenance shall include, but not be limited to, painting, structural repairs, and integrity of security measures. Site access



shall be maintained to a level acceptable to the local Fire Chief and Emergency Medical Services. The owner or operator shall be responsible for the cost of maintaining the solar photovoltaic installation and any access road(s), unless accepted as a public way.

### **3.11.2 Modifications**

All material modifications to a solar photovoltaic installation made after issuance of the required building permit shall require approval by the Site Plan Review Authority.

## **3.12 Abandonment or Decommissioning**

### **3.12.1 Removal Requirements**

Any large- scale ground-mounted solar photovoltaic installation which has reached the end of its useful life or has been abandoned consistent with Section 3.12.2 of this bylaw shall be removed. The owner or operator shall physically remove the installation no more than 150 days after the date of discontinued operations. The owner or operator shall notify the Site Plan Review Authority by certified mail of the proposed date of discontinued operations and plans for removal. Decommissioning shall consist of:

- (a) Physical removal of all large- scale ground-mounted solar photovoltaic installations, structures, equipment, security barriers and transmission lines from the site.
- (b) Disposal of all solid and hazardous waste in accordance with local, state, and federal waste disposal regulations.
- (c) Stabilization or re-vegetation of the site as necessary to minimize erosion. The Site Plan Review Authority may allow the owner or operator to leave landscaping or designated below-grade foundations in order to minimize erosion and disruption to vegetation.

### **3.12.2 Abandonment.**

*Note: Recognizing that other remedies, such as a tax lien, are available to communities in the event an abandoned facility is legitimately putting public safety at risk this model zoning does not require the provision of surety to cover the cost of removal in the event the municipality must remove the installation and remediate the landscape. Communities can, however, require surety in circumstances where a valid planning purpose for doing so exists.*