Model Zoning Bylaw:
Allowing Use of Solar Photovoltaic Installations

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

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This model bylaw was prepared to assist cities and towns in establishing reasonable standards to facilitate the development of Solar Photovoltaic Installations, including large, Primary Use Solar Photovoltaic Installations.

DOER acknowledges that this model represents our own understanding of state law and has made every effort to carefully research this issue. While DOER believes our interpretation is reasonable, we anticipate that local municipal counsel may offer a different interpretation and that communities will need to consider these alternatives moving forward. It is highly recommended that any local regulatory language developed from this Guidance be reviewed by municipal counsel prior to adoption.

In forming their bylaw, Municipalities can consider any standard contained within DOER's Guideline on Public Health, Safety, and Environmental Standards.

This model bylaw includes grey highlighted phrases or sections that may need to be revised to make the model consistent with the municipality's ordinances or bylaws or specific numerical criteria that the municipality may wish to adjust.

1.0 Purpose

The purpose of this bylaw is to promote the development and installation of new 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 provide adequate financial assurance for the eventual decommissioning of such installations.

The provisions set forth in this section shall apply to the installation, operation, and/or maintenance of Solar Photovoltaic Installations not subject to the jurisdiction of the Energy Facilities Siting Board.

2.0 Definitions

Accessory Use: A Solar Photovoltaic Installation is considered an Accessory Use when it is subordinate to a permitted or conditional use or structure and customarily

incidental to the permitted or conditional use of the structure. An Accessory Use cannot exist without a Primary Use on the same lot. Examples of Accessory Use include Building-Mounted, Canopy, and Agrivoltaic Installations. Notwithstanding the foregoing, Solar Photovoltaic Installations serving behind-the-meter load, including business cooperatives or residential microgrids, should be treated as an Accessory Use even if it is the sole facility located on the parcel. A Solar Photovoltaic Installation need not serve behind-the-meter load to be considered an Accessory Use.

Note: *Battery Energy Storage Systems (BESS) co-located with solar photovoltaic facilities may be treated as an accessory use to the solar facility. See the BESS Model Bylaw for suggested treatment of accessory and primary use BESS.*

The primary use of a co-located facility should be determined by which facility has a greater electrical capacity. In the event that the electrical capacity of the BESS and solar facility are the same, the solar facility should be treated as the primary use, as the land area per megawatt of solar is greater than that of the BESS.

Agrivoltaic Installation: A Solar Photovoltaic Installation that submits an annual report to the DOER and the Department of Agricultural Resources pursuant to 225 CMR 28.11(1) demonstrating that the land continues to be retained and used primarily and directly for agricultural purposes pursuant to M.G.L. c. 61A §§1 and 2.

As-of-Right or By Right Siting: As-of-Right Siting shall mean that development may proceed without the need for a special permit, variance, zoning amendment, waiver, or other discretionary zoning approval. As-of-Right development may be subject to Site Plan Review (as set out in Section 5.0) to determine conformance with local zoning ordinances or bylaws. Projects allowed As-of-Right, including those subject to Site Plan Review, cannot be prohibited but can be reasonably regulated by the person or board designated by local ordinance or bylaw. The designated person or board may be the Planning Board or the inspector of buildings, building commissioner or local inspector, or if there is none in a town, the Select Board, or person or board designated by local ordinance or bylaw.

Battery Energy Storage System (BESS): A system consisting of one or more battery modules for storing electrical energy, any equipment needed to support the safe and proper function or usage of the battery modules, and one or more physical containers providing secondary containment to any of the above. It may be a primary use or an Accessory Use to a solar generating facility, power generation facility, electrical substation, or other similar uses. See the associated BESS Model Bylaw for further information. For the purposes of this bylaw, batteries utilized in consumer products are excluded from these requirements.

Brownfield: A property the redevelopment or reuse of which is hindered by the presence of oil or hazardous materials on all or part of, or in the vicinity of, such property, where the disposal site at issue has received a release tracking number from MassDEP pursuant to 310 CMR 40.0000: *Massachusetts Contingency Plan* or a significant risk of oil or hazardous materials contamination has been identified by a Licensed Site Professional. The terms "disposal site," "release tracking number," "oil," and "hazardous materials" shall have the meanings given to such terms in 310 CMR 40.0006: *Terminology, Definitions and Acronyms*. No disposal site that otherwise meets this definition shall be excluded from consideration as a Brownfield because its cleanup is also regulated by the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§ 9601-9675, the Resource Conservation and Recovery Act, 42 U.S.C. §§ 6921-6939g, or any other federal program.

Building-Mounted Installation: A Solar Photovoltaic Installation with 100% of the nameplate capacity of the solar photovoltaic modules used for generating power installed on a building.

Canopy Installation: A Solar Photovoltaic System for which 100% of the nameplate capacity of the solar photovoltaic modules used for generating power is located on a raised structure allowing for the continued use of the area beneath for another function including, but not limited to, parking, pedestrian walkway, transportation infrastructure, storage of equipment, or canal. Canopy Installations should be subject to the same height restrictions that apply to other types of structures in a given zoning district.

DOER: The Massachusetts Department of Energy Resources, established by M.G.L. c. 25A.

Eligible Landfill: A landfill that has received an approval from MassDEP for the use of a Solar Photovoltaic Installation at the landfill as a post-closure use pursuant to 310 CMR 19.143: *Post-closure Use of Landfills* prior to the commencement of construction activities.

MassDEP: The Massachusetts Department of Environmental Protection, established by M.G.L. c. 23J, § 2.

Primary Use: A Solar Photovoltaic Installation is considered a Primary Use when the primary use of the lot or lots is for the commercial generation of power. Large-scale, ground-mounted solar installations typically fall into this category.

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

Site Footprint. The area of land and water encompassed by a Solar Photovoltaic Installation's equipment, plus any land significantly impacted by construction of the

Solar Photovoltaic Installation, including, but not limited to, land altered of its natural vegetative composition and structure for clearing, grading, and roadways.

Site Plan Review: Review by the Site Plan Review Authority to determine conformance with local zoning ordinances or bylaws. Site Plan Review for By-Right projects may reasonably condition, but not deny, the project applications.

***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 Ctrs., Inc. v. Town of Auburn Planning Bd., 18 Land Ct. Rep. 377 (2010) 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 v. Bd. Of Appeals of Westwood, 23 Mass. App. Ct. 278, 281-82, 502 N.E.2d 137 (1986); Quincy v. Planning Bd. Of Tewksbury, 39 Mass. App. Ct. 17, 21-22, 652 N.E.2d 901 (1995) ("[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 283, n. 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 local government body designated as such by the municipality.

***Note**: The Site Plan Review Authority can be the Select Board, City Council, Board of Appeals, Planning Board or Zoning Administrator, or Building Inspector. 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.*

Solar Photovoltaic Installation: An arrangement of panels that generates electricity using solar photovoltaic technology. This bylaw also refers to Solar Photovoltaic Installations as solar facilities and projects.

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

Note: *By 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. c. 40A, § 7. In most communities, the building inspector is the person charged with enforcing both the Commonwealth's building code and local zoning ordinances or bylaws. Municipalities may replace the term Zoning Enforcement Authority with its preferred term (e.g., Building Inspector).*

Similarly, municipalities may wish to replace references to the "Local authority responsible for issuing permits required under the State Fire Code, 527 CMR 1.00" with the municipality-specific title.

3.0 Applicability

This section applies to any Solar Photovoltaic Installation that applies for a permit 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. For Solar Photovoltaic Installations with Co-located battery energy storage systems (BESS), also see the associated BESS Model Bylaw.

This section is intended to complement the consolidated siting and permitting process for small clean energy infrastructure facilities established under Chapter 239 of the Acts of 2024.

Qualifying as a Green Community

To satisfy the Green Communities Act As-of-Right zoning requirement, codified at M.G.L. c. 25A, § 10(c), a municipality may adopt by-right zoning for Solar Photovoltaic Installations in at least one Designated Location, which permits a Primary Use Solar Photovoltaic Installation with a nameplate capacity of 250 kW (DC) or more. Municipalities should reference guidance from the Department of Energy Resources (DOER) Green Communities Division on meeting zoning criteria for Designated Locations to qualify as a Green Community. These model bylaws are designed to comply with Criterion 1 of becoming a Green Community, but municipalities do not necessarily need to adopt the model bylaws wholesale to meet Criterion 1.

***Educational Note**: Existing Massachusetts law limits the local zoning restrictions that can be placed on solar and storage facilities. Massachusetts General Laws Chapter 40A, Section 3, ninth paragraph, provides:*

"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."

This exception is often referred to as the "Dover Amendment."

The Massachusetts Attorney General's Office reviews all zoning bylaws for compliance with state law, including with M.G.L. c. 40A, § 3.

There has been significant jurisprudence surrounding the interpretation and implementation of M.G.L. c. 40A, § 3 to solar and battery storage resources. This includes:

- *Tracer Lane II v Waltham, 489 Mass. 775 (2022), Supreme Judicial Court ruling that a City's limiting of primary use solar to the 1-2% of the town-zoned industrial land impermissibly violates the Dover Amendment.*
- *Kearsarge Walpole v. ZBA Walpole, a 2024 Mass. Appeals Court decision (No. 23-P-128) finding that the town's zoning bylaw confining large ground-mounted solar to designated overlay districts was impermissible because the overlay districts allowing large ground-mounted solar covered only approximately 2% of the Town's land. The Court did not find that overlay districts are impermissible, but rather that the bylaw unduly restricts solar energy systems to those overlay districts and therefore violates M.G.L. c. 40A, § 3.*
- *Sunpin Energy Services LLC v. ZBA of Petersham, 497 Mass. 794 (2026), Supreme Judicial Court ruling that the Town improperly denied a special permit because denial was based primarily on the 14.3 acres of tree clearing required in a Town is 97% forested and therefore such rationale is an effective blanket prohibition on large-scale solar systems.*
- *Northbridge McQuade, LLC v. Northbridge Zoning Bd. of Appeals, June 2021 Mass. Land Court (Decision 18 Misc 000519), finding that the Town's minimum frontage requirement of 150 feet was improperly applied to the solar facility in question, as there was no legitimate concern regarding public health, safety, or welfare.*
- *Summit Farm Solar v. New Braintree, a 2022 Land Court decision, 18 MISC 000367, ruling that towns cannot condition special permits on zero or negligible visual impact.*

- *NextSun Energy LLC v. Fernandes, a 2023 Land Court decision (decision 19 MISC 000230), affirmed by the Massachusetts Appeals Court in 2025, finding that co-located battery storage with solar is protected by M.G.L c. 40A, § 3.*
- *Duxbury Energy Storage v. Town of Duxbury ZBA, June 2025 Land Court decision 23 MISC 000643, finding that standalone BESS is protected by M.G.L. c. 40A, § 3.*

We note this is not an exhaustive list of cases, and case law will evolve over time. Municipalities should consult with municipal counsel on any bylaw changes.

3.1 Solar Photovoltaic Installation Classes

The following table defines certain classes of Solar Photovoltaic Installations, characterized by a combination of size and use case, with differentiated zoning and permitting requirements as further detailed below.

Table 1: Solar Photovoltaic Installations by Class/Size and Associated Zoning/Permitting Requirements by District

		Residential	Commercial	Industrial	Agricultural
	Building-Mounted/Canopy/ Agrivoltaic (< 25 MW)	Y	Y	Y	Y
Ground-Mounted	**Small** (< 25 kW**)**	Y	Y	Y	Y
	Medium - Primary Use (25 – 250 kW)	SPR	SPR	Y	SP
	Medium – Accessory Use (25 – 250 kW)	SPR	SPR	Y	SPR
	Large I (> 250kW - 1MW)	SP	SPR	SPR	SP
	Large II (> 1MW - < 25MW)	SP	SP	SP	SP
	Large – Accessory Use (> 250 kW – < 25MW)	SPR	SPR	SPR	SPR
	Landfill/Brownfield (< 25MW)	SP	SPR	SPR	SPR
	Large III (>25MW)	SP			

Y = By Right, Subject to Building Permit Only
SPR = By Right, Subject to Site Plan Review. (As noted above, under SPR the Site Plan Review authority may not unconditionally deny a Site Plan Application but may impose reasonable conditions.)
SP = Special Permit
N = Not Permitted

Notes:

The Table of Uses (above) for Solar Photovoltaic Installations was developed for general classes of zoning districts. It is based partially on input from stakeholders including municipal/regional planners, solar developers, and environmental advocacy groups. Municipalities will need to add Solar Photovoltaic Installations to their table of uses or lists of allowed/permitted uses based on the purpose and standards for each zoning district in the municipality.

Planned growth areas or planned business districts should be considered Commercial areas.

Municipalities may also adopt different classifications or permitting thresholds than those in the Model Solar Bylaw.

To the extent a municipality has districts not listed here it should apply the classifications applicable to the district closest in character to the district in question.

The thresholds between categories are not fixed and municipalities may vary the thresholds to fit circumstances in their community, provided that significant variations or variations that have an unreasonably restrictive effect should be avoided.

DOER encourages municipalities to evaluate and consider adopting one or more clean energy overlay zones that enable differentiated review of different classes of Solar Photovoltaic Installations, based on the areas most appropriate for Primary Use solar facilities. Such overlay districts allow municipalities to guide clean energy installations to preferred areas and incentivize them to avoid areas that are not preferred. In particular, communities that are concerned about impacts to water resources could use overlay districts to direct development away from sensitive receptors such as aquifers and wellheads.

Overlay districts may be especially of interest for certain Massachusetts communities, more often small and rural communities, that consist of a single zone, typically "Residential-Agricultural." As noted in the discussion of Kearsarge Walpole v. ZBA Walpole, prohibiting ground-mounted solar outside of an overlay district that covers

only a small percentage of the municipality's land has been found to violate the Dover Amendment. Considerations when approaching overlay districts may include the size of the overlay district and if ground-mounted solar is ever allowed to be sited outside of the overlay district, such as with a special permit. It is recommended that municipalities work with municipal counsel on decisions related to overlay districts.

We also note that the model use table above does not prohibit solar facilities in any of the common zoning districts. In light of the Tracer Lane II decision, 489 Mass. 775 (2022), municipalities that wish to prohibit Primary Use solar in certain districts should be cautious to not exclude solar from a large portion of its land.

For projects categorized as By Right, only Section 4.0 below applies. For projects categorized as Site Plan Review, Sections 4.0 and 5.0 apply. For projects categorized as special permit, Sections 4.0, 5.0, and 6.0 apply.

4.0 General Requirements

The following requirements are common to all Solar Photovoltaic Installations to be sited in designated locations.

The following requirements could apply to all projects, or just projects of certain sizes. For example, residential projects and certain accessory use projects up to a certain size could be exempt from 4.3-4.10.

4.1 Compliance with Laws, Ordinances and Regulations

The construction and operation of all 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. Other applicable requirements may include but are not limited to: DOER's regulation on Small Clean Energy Infrastructure Facility Siting and Permitting (225 CMR 29.00), MassDEP noise standards, the State Fire Code (527 CMR 1.00), the Massachusetts Environmental Policy Act (MEPA), and other applicable local bylaws.

***Additional Resources for other Applicable Regulations**:*

- ***DOER Clean Energy Siting & Permitting Division:*** *DOER Siting & Permitting and Guidance, including 225 CMR 29.00*
- ***Massachusetts Department of Environmental Protection (DEP):*** *Noise Standards, Wetlands Protection Act Regulations, Stormwater Handbook and Standards*
- ***State Fire Code (527 CMR 1.00):*** *Massachusetts State Fire Marshal*

- ***Massachusetts Environmental Policy Act (MEPA):*** *MEPA Office*
- ***Massachusetts State Building Code (780 CMR):*** *Board of Building Regulations and Standards*
- ***Local Bylaws and Ordinances:*** *Check with the local planning board, zoning board, or building department for town-specific requirements*
- ***Federal Requirements:*** *National Environmental Policy Act (NEPA)*
- ***Regional Planning:*** *Check with regional planning agency for your area for additional considerations when adapting this model bylaw.*

4.2 Building Permit and Building Inspection

No 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 owner or operator may request an extension of the permit and more than one extension may be granted. Under Section 119 of Chapter 239 of the Acts of 2024, as amended by Section 136 of Chapter 248 of the Acts of 2024, permits granted to clean energy generation or storage projects between October 22, 2020, and August 1, 2024 will not expire until August 1, 2029.*

4.3 Fees

The application for a Building Permit for a Solar Photovoltaic Installation must be accompanied by the fee required for a Building Permit. Applications for Solar Photovoltaic Installations requiring Site Plan Review must be accompanied by the fee for Site Plan Review specified in <<reference fee schedule or bylaw for Site Plan Review fee>>. Likewise, applications for Solar Photovoltaic Installations requiring a special permit must be accompanied by fee listed in <<reference fee schedule or bylaw for Special Permit fee>>.

Note: *Municipalities structure fees in a variety of ways. Most use a tiered structure based on the estimated construction cost. A municipality may consider reduced permit fees or other incentives for projects located on preferred sites, e.g., Brownfields, landfills, industrial/commercial parcels, or other previously disturbed lands.*

Fees should be designed to cover the municipality's cost to permit the project and not designed to generate net revenue for the municipality.

4.4 Site Control

The project owner or operator 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.

Examples of acceptable documentation of site control may include:

- *Deed showing ownership of the project site*
- *Lease agreement with the landowner*
- *Option to lease or option to purchase the property*
- *Easement granting rights to use the land for solar development*
- *Any other documentation sufficient to demonstrate that the project owner or operator has, or will have, the legal right to construct and operate the installation on the site*

4.5 Operations and Maintenance Plan

The project owner or operator shall submit a plan for the operation and maintenance of the Solar Photovoltaic Installation, which shall include measures for maintaining safe access to the installation, stormwater controls, and general procedures for operational maintenance of the installation.

Note: *Municipalities may want to refer to the DOER Guideline on Public Health, Safety, and Environmental Standards* and *Guideline on Common Conditions for a model approach to operations and maintenance plans. Applications utilizing the consolidated permitting process must comply with the standards and requirements for operation and maintenance pursuant to 225 CMR 29.00.*

4.6 Utility Notification

No Solar Photovoltaic Installation shall be constructed until evidence has been given 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.

4.7 Setbacks

Solar Photovoltaic Installations must comply with all setbacks for the zoning district where they are located.

Some municipalities may wish to vary the setbacks for Solar Photovoltaic Installations based on the needs and character of the community. A stakeholder group including municipal/regional planners, solar developers, and environmental advocacy groups developed the following alternative front, side, and rear setbacks as an example of what solar setbacks installation might look like should they differ from the setbacks for the zoning district in which the solar is located:

(a) *Front yard: The front yard depth shall be at 10-30 feet; provided, however, that where the lot abuts a Residential district, the front yard shall not be less than 50 and not more than 75 feet.*

(b) *Side yard. The side yard depth shall be 10-30 feet; provided, however, that where the lot abuts a Residential district, the side yard shall not be less than 50 feet and not more than 75 feet.*

(c) *Rear yard. The rear yard depth shall be 15-35 feet; provided, however, that where the lot abuts a Residential district, the rear yard shall not be less than 50 feet and not more than 75 feet.*

In general, less densely developed communities may want larger setbacks and more developed communities may want smaller setbacks. Setbacks, however, should not be so large as to result in de facto prohibition on Solar Photovoltaic Installations across large areas of the municipality. A Solar Photovoltaic Installation may have a setback that exceeds the required value if necessary to comply with other applicable standards (e.g., for noise or safety).

4.8 Design Standards

All Solar Photovoltaic Installations [insert any size or project limits here] are subject to the following design standards:

4.8.1 Lighting

Lighting of Solar Photovoltaic Installations shall be consistent with local, state and federal laws. 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.

Note: *See Dark Sky Massachusetts Model Bylaw for a more in-depth model bylaw for outdoor lighting. See the International Dark Sky Association website (http://www.darksky.org/fsa/) for further information.*

Municipalities may want to refer to DOER Guideline on Common Conditions and Guideline on Public Health, Safety, and Environmental Standards for a model approach to lighting. Applications utilizing the consolidated permitting process must comply with the standards and requirements for lighting pursuant to 225 CMR 29.00.

4.8.2 Signage

Signs on Solar Photovoltaic Installations shall comply with the municipality's sign bylaw. Signs shall identify the project owner or operator and provide a 24-hour emergency contact phone number. Signage must be updated to reflect any changes to contact information within 90 days of any change.

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. Notwithstanding any general or zoning sign bylaw to the contrary, safety-related signs and signs required by either the State Fire Safety Code or the State Electrical Code, of reasonable size and number, shall be permitted.

4.8.3 Screening

If necessary and reasonable to minimize visual impacts on adjacent public ways, driveways, and abutting residential dwellings, Solar Photovoltaic Installations shall include year-round screening. Screening may consist of vegetation, berms, fencing, or a combination thereof and should preserve natural vegetation to the maximum extent possible. Screening shall be maintained throughout the life of the installation. Screening requirements for Small and Medium Solar Photovoltaic Installations may be reduced or waived at the discretion of [insert appropriate department or board.]

4.8.4 Landscaping

If the developed area includes open vegetated areas, these landscaped areas will be maintained over the life of the Solar Photovoltaic Installation and, where feasible, prioritize the use of native plants.

***Note:** Municipalities may want to refer to DOER Guideline on Common Conditions and Guideline on Public Health, Safety, and Environmental Standards for a model approach to landscaping. Applications utilizing the consolidated permitting process must comply with the standards and requirements for landscaping pursuant to 225 CMR 29.00.*

4.8.5 Fencing

Ground-mounted Solar Photovoltaic Installations [of a certain size of type] must be completely enclosed by chain-link or a comparable protective measure consistent with the requirements of 527 CMR 12.00. Where feasible, owners and operators of Solar Photovoltaic Installations that utilize fencing shall undertake reasonable efforts to (i) install wildlife-friendly fencing such as raised-bottom fencing to allow for passage of small animals and (ii) in areas at risk of flooding, adopt a fencing design that allows for the reasonable flow of floodwater.

Note on Utility Infrastructure Placement: *Where there is existing aboveground utility infrastructure, the impacts of incremental aboveground utility interconnections may be minimal. Utility interconnections should generally not be required to be underground unless there are site-specific reasons for undergrounding. However, where there are site-specific reasons to do so, municipalities may require utility connections from Solar Photovoltaic Installations that require Site Plan Review to be placed underground, depending on appropriate soil conditions, shape, and topography of the site, and any requirements of the utility provider, as a condition of a permit granted by the Site Plan Review Authority. It is recommended that municipalities allow electrical transformers for utility interconnections to be above ground.*

4.8.6 Appurtenant Structures

All such appurtenant structures, including but not limited to equipment shelters, battery energy storage facilities, transformers, and substations, shall be architecturally compatible with each other. Architecturally compatible means that the materials and designs should be integrated into the existing landscape. 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 municipality's zoning ordinance or bylaw.*

4.9 Safety and Environmental Standards

4.9.1 Emergency Services

The Solar Photovoltaic Installation owner or operator shall provide a copy of the project summary, electrical schematic, and site plan to the <<local authority responsible for issuing permits required under the State Fire Code, 527 CMR 1.00>>. 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 contact person for public inquiries and shall update that contact information as needed.

4.9.2 Land Clearing and Soil Erosion

Clearing of natural vegetation shall be limited to what is reasonably necessary for the construction, operation and maintenance of the Solar Photovoltaic Installation or otherwise prescribed by applicable laws, regulations, and bylaws**.**

Notes on Environmental Protections*:*

- *Some Massachusetts municipalities require habitat mitigation offsets for large-scale solar built on previously undeveloped land, requiring developers to conserve land in proportion to the land disturbed by the solar installation. The Massachusetts Attorney General's Municipal Law Unit has approved mitigation ratios of 1:1 and 2:1, and has disapproved one instance of a 4:1 habitat mitigation ratio. Such mitigation may be incorporated into a local bylaw, and/or included in a Community Benefits Agreement.*
- *Project owners and operators should site and design their solar installation to avoid, minimize or, if impacts cannot be avoided or minimized, mitigate siting impacts and environmental and land use concerns to the greatest extent possible.*
- *Stormwater management, watershed protection, flood zones, and wetland protections are regulated at the state and federal levels.*
- *MassDEP Wetlands Program Policy recommends, but does not require, land disturbance and grading to be conducted in a phased manner to minimize runoff from solar development.*

Water Resources and Clean Energy Zoning

Note on Private Wells: *Private wells are regulated by local health boards. Municipalities should defer to their local health regulations.*

A Note on Other Drinking Water Protections: *If a BESS installation is proposed for construction in an Aquifer Protection Overlay District, Watershed District, or similar district/overlay district implementing zoning controls for drinking water protections under 310 CMR 22.00, the BESS must comply with all regulations related to this district/overlay district.*

Specifically, 310 CMR 22.00 governs activities in public water supply areas. In Zone I, where the wellheads are located, current and/or future land uses are limited to those directly related to the provision of public drinking water supply or will have no adverse impact on water quality (310 CMR 22.21(1)(b)(5))

A 2011 (rev. 2018) policy from MassDEP prohibits batteries or housing batteries within Zone I. For solar in zone I, there must be an explanation of how the energy generated benefits the water supplier

310 CMR 22.00 also requires zoning and/or non-zoning controls for Zone II, which is the land surrounding the Zone I wellhead area. Part of these controls include a list of prohibited activities, including, but not limited to:

- *Landfills and open dumps*
- *Automobile graveyards*
- *Stockpiling of snow or ice that contains sodium chloride or other chemicals used for snow and ice removal*
- *Bulk petroleum storage*
- *Storage of sludge and septage*
- *Storage of liquid hazardous materials unless such storage is above ground, on an impervious surface, and with proper containment*

See 310 CMR 22.21 for additional information.

4.10 Monitoring and Maintenance

4.10.1 Solar Photovoltaic Installation Conditions

The Solar Photovoltaic Installation shall be maintained 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 <<local authority responsible for issuing permits required under the State Fire Code, 527 CMR 1.00>>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) under the owner or operator's control, unless accepted as a public way.

4.10.2 Modifications

All material modifications to a Solar Photovoltaic Installation made after issuance of the required Building Permit shall require approval by the [insert appropriate board or department]. Any increase in Site Footprint, changes to the site that would impact the Site Suitability Score (if applicable), or impact resource areas protected by other municipal bylaws, the addition of battery energy storage, or significant alterations to project configuration shall constitute a material modification.

4.10.3 Change of Ownership

The Solar Photovoltaic Installation owner or operator must provide written notification to the municipality within 15 days if there is any change of project ownership, and the municipal officials in receipt of the notification shall relay said information to the appropriate emergency response personnel. Any relevant signage at the site shall be updated within 30 days of a change of ownership. Notifications must include name, business address, phone number, email address, and emergency phone number of the new owner.

4.11 Abandonment or Decommissioning

4.11.1 Removal Requirements

Any Solar Photovoltaic Installation that has reached the end of its useful life or has been abandoned consistent with Section 14.11.2 of this bylaw shall be removed. The Solar Photovoltaic Installation shall be physically removed no more than 150 days after the planned decommissioning date, or the date the Installation has been deemed abandoned, whichever occurs first. The owner or operator shall notify the [insert appropriate board or department] by certified mail of the decommissioning date and plans for removal. The Solar Photovoltaic Installation owner shall prepare a decommissioning plan that includes removal of all structures, buildings, cabling, electrical components, security barriers, roads, foundations, pilings, and any other associated facilities, so that any agricultural ground upon which the facility and/or

system was located is again tillable and suitable for agricultural uses. Decommissioning shall consist of:

1. Physical removal of Solar Photovoltaic Installations, structures, buildings, cabling, electrical components, security barriers, roads, foundations, pilings, and any other associated facilities. The [municipality] may use its discretion to allow certain equipment to remain in place to accommodate the construction of a new Solar Photovoltaic Installation. Such equipment may include mounting hardware, interconnection equipment, and fencing.
2. Disposal of all solid and hazardous waste in accordance with local, state, and federal waste disposal regulations.
3. Disturbed earth shall be graded and re-seeded as necessary to minimize erosion unless the landowner requests in writing that the access roads or other land surface areas not be restored. The[municipality] may allow the owner or operator to leave landscaping or designated below-grade foundations to minimize erosion and disruption to vegetation.

Note: *Municipalities may want to refer to DOER's Guideline on Public Health, Safety, and Environmental Standards* and *Guideline on Common Conditions for a model approach on decommissioning and abandonment. Applications utilizing the consolidated permitting process must comply with the standards and requirements for decommissioning and abandonment pursuant to 225 CMR 29.00.*

4.11.2 Abandonment

A Solar Photovoltaic Installation will be considered to be abandoned if the facility ceases to operate or undergo active repair or replacement, for more than twelve (12) months, without written consent of the Zoning Enforcement Authority. A Solar Photovoltaic Installation also shall be presumed abandoned if the owner or operator fails to respond affirmatively within thirty (30) days to a written inquiry from the Zoning Enforcement Authority as to the continued validity and operation of the system. If the owner or operator fails to comply with decommissioning upon any abandonment, the municipality shall have the right, to the extent it is otherwise duly authorized by law, to enter the property and physically remove the installation at the expense of the owner of the installation and the owner(s) of the site on which the installation is located. The Town may use the financial surety as described in Section 5.9.3 below for this purpose.

Note on Abandonment: *To monitor continued operation of a solar facility, municipalities may require project owners to provide an annual production report disclosing the amount of energy produced by the facility in each month.*

4.11.3 Decommissioning Fund

Prior to construction, the project owner shall provide the municipality, in cash, bond, letter of credit, escrow, or another form reasonably acceptable, a surety to cover the cost of removal of a ground-mounted Solar Photovoltaic Installation in the event the municipality must remove the installation and remediate the landscape. The amount of the surety shall be 125% of total amount of equipment and labor rates outlined by the Massachusetts Department of Labor Standard's Prevailing Wage Program and shall account for increased costs due to inflation at a rate of 2.5% per year. The [municipality] shall reserve the right to have the decommissioning plan reviewed by a third-party engineer at the cost to the Applicant. The project owner shall provide an updated estimate after ten (10) years of project operation and subsequent updates in five-year intervals after that date, for the remainder of the project's lifetime. The project owner shall provide additional surety in the amount of 125% of the most recent estimated cost of decommissioning.

This surety will not be required for municipally or state-owned facilities.

Note on Surety: *When decommissioning is as long as 25 years away, surety provisions should include a mechanism to ensure that the abandonment surety accounts for inflation and other cost increases during the lifetime of the facility.*

5.0 Site Plan Review

Solar Photovoltaic Installations that require Site Plan Review, as specified in Table 1 under Section 3.0, shall undergo review by the designated Site Plan Review Authority prior to any construction, installation, or modification in accordance with this section. Projects that require Site Plan Review and proceed through the consolidated permitting process are required to comply with the applicable provisions of *225 CMR 29.09: Consolidated Local Permit Application*.

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. Municipalities are encouraged to adopt clear standards for approval of site plans. When issuing a conditional approval, the Site Plan Review Authority should cite conditions that are tied to specific land use concerns, such as screening and buffering, vegetation clearing, lighting, and noise.*

Additional Considerations: *As part of the implementation of a solar photovoltaic bylaw, municipalities should consider amending their existing Site Plan Review provisions to incorporate Site Plan Review conditions that apply specifically to such installations. These provisions shall comply with the review standards in the local*

bylaw, and any other applicable regulations, such as 225 CMR 29.00 for projects utilizing the consolidated local permitting process

5.1 Required Documents

Pursuant to the Site Plan Review process, the project owner or operator shall provide the following documents:

A. Current contact information (as of the date of the permitting application) and signature of the project owner or operator, as well as all co-proponents, if any, and all other owners;
B. Current contact information (as of the date of the permitting application) and signature of any agents representing the owner or operator, if any;
C. Current contact information for the person(s) responsible for public inquiries;
D. One- or three-line electrical diagrams detailing the Solar Photovoltaic Installation, associated components, and electrical interconnection methods, with all National Electric Code compliant overcurrent devices;
E. A site plan prepared, stamped and signed by a Professional Engineer licensed to practice in the Commonwealth of Massachusetts, showing:
    i. Property lines and physical features, including but not limited to roads, characteristics of vegetation (mature trees, old growth, shrubs, open field), wetlands, and streams for the project site;
    ii. Proposed landscape of the site, grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures, snow storage, and stormwater management systems;
    iii. Zoning district of project site and adjacent parcels;
    iv. Proposed layout of major system components including the panels, inverters, any fire detection and suppression systems, and racking or mounting;
    v. Total limit of disturbance;
    vi. Total area of vegetation clearing, not including mowed field;
    vii. Contour lines with an interval of no more than 2 feet;
    viii. Property lines of parcels within 300 feet, and any existing structures;
    ix. Location, dimension, and types of existing structures on the property;
    x. Location of noise producing equipment;
    xi. Trees with a diameter at breast height (DBH) of 20 inches or greater, mature Birch trees, and trees covered by any applicable tree ordinance within the project site that will be removed as part of the project;
    xii. The right-of-way of any public road that is abutting the property;

xiii. Overhead and underground utilities;
xiv. Locations of floodplains or inundation areas associated with moderate or high hazard dams;
xv. Stormwater management and erosion and sediment control;
xvi. Bodies of water, including streams, rivers, lakes, and ponds;
xvii. Historic and cultural resources, including those listed on the Massachusetts Register of Historic Places or those defined by the National Historic Preservation Act;
xviii. Trails and recreation areas, including access points;
xix. Proposed fencing;
xx. Staging area(s) and offsite parking during construction.

F. Proof of notification the owners of record for all abutting properties and properties within 300 feet of the subject parcel's boundary;
G. A Site Suitability Report, if applicable, as prescribed by 225 CMR 29.07;
H. A detailed description of the proposed project, including the proposed Site Footprint and the surrounding area with relevant maps, figures, drawings, anticipated permits, a description of any proposed Payment in Lieu of Taxes (PILOT) payment (if applicable; a finalized PILOT agreement is not required at the time of application and is typically negotiated separately from, and may occur after, permit approval), or other attachments specified by 225 CMR 29.00 or associated guidance, if applicable;
I. Documentation of actual or prospective access and control of the project site (see also Section 5.2);
J. An operation and maintenance plan (see also Section 5.3);
K. If applicable, a preliminary emergency response plan pursuant to 225 CMR 29.00, which the applicant may update prior to construction and as necessary to reflect final equipment selection and any material design changes (see also Section 5.7.1);
L. Documentation of hazardous materials/substances/liquids safety data sheets and quantities for proposed solar components and other associated hazardous materials;
M. A preliminary equipment specification sheet that documents the proposed Solar Photovoltaic Installation components and other associated electrical equipment that are to be installed, including the manufacturer and model. A final equipment specification sheet shall be submitted prior to issuance of a Building Permit;
N. Proof of liability insurance provided to the Site Plan Review Authority prior to the commencement of construction; and

O. Certification of compliance with all local, state and federal regulations and guidance.

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

Note: *Local bylaws should endeavor to outline all the reports, data, and studies required for Site Plan Review, and Site Plan Review Authorities should avoid requesting further studies ad hoc during the review process. The Site Plan Review Authority may request additional information on the items enumerated in the Required Documents.*

Note on Proof of Notification*: The proof of notification to abutters and property owners listed in Section 5.1 complies with M.G.L. c. 40A, § 11, which requires mail notification of abutters and abutters to abutters within 300 feet when a public hearing is required during the review process for the proposed development.*

6.0 Special Permit

Prior to construction, installation, or modification, projects that require a special permit shall comply with all provisions in [*insert Town Special Permit bylaw reference here] and MGL Chapter 40A S9*. Any project that requires a special permit shall also acquire a building permit and undergo Site Plan Review and comply with the applicable provisions of Sections 4.0 and 5.0 above. The special permit granting authority for the development of solar installations shall be the [*Insert town authority here*].

The Special Permit Granting Authority shall consider the request for a Special Permit based on whether the use is in harmony with the general purpose and intent of the ordinance or by-law, and shall be subject to general or specific provisions set forth therein; and such permits may also impose conditions, safeguards and limitations on time or use.

6.1 Special Permit Waivers

Upon written request by the applicant, the special permit granting authority may waive or reduce any special permit requirement of this Section by the same majority vote required for the permit itself upon written findings of:

1. Special circumstances of the site, its surroundings, or the proposal design that negate the need for imposition of the requirement, or the objectives served by the special permit requirement will be met in an alternative manner; and

2. That such a waiver or reduction will not result in a Solar Photovoltaic Installation facility that endangers public health, safety or welfare.

Such requests must be made by the applicant no later than the close of the public hearing. An affirmative or negative vote under this paragraph shall not be construed as an approval or disapproval of the special permit sought.

***Note on Special Permits**: Broadly speaking, discretionary denials of special permit applications for uses protected under the Dover Amendment, including BESS, will be viewed with more scrutiny by courts than for uses not protected by the Dover Amendment.*

In particular, the Summit Farm case states: "The better, and correct, view of the limits of local regulation of solar energy facilities allowed by G. L. c. 40A, § 3 is that such local regulation may not extend to prohibition except under the most extraordinary circumstances, and that special permits regulating solar energy facilities must be treated like site plan approval, which allows for regulation but not for prohibition."