2020

# SOLAR BEST PRACTICES GUIDE

## A GUIDE TO ASSIST MUNICIPALITIES WITH SOLAR LAND USE REGULATIONS

Prepared by Pioneer Valley Planning Commission with assistance from towns and cities in the Pioneer Valley: *Belchertown, Blandford, Easthampton, East Longmeadow, Hadley, Northampton, Pelham, Ware, Westhampton, WIlbraham, and Williamsburg*, with Support from the Massachusetts District Local Technical Assistance Fund

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Town of Belchertown
Town of Blandford
City of Easthampton
Town of East Longmeadow
Town of Hadley
City of Northampton
Town of Pelham
Town of Ware
Town of Westhampton
Town of Wilbraham
Town of Williamsburg

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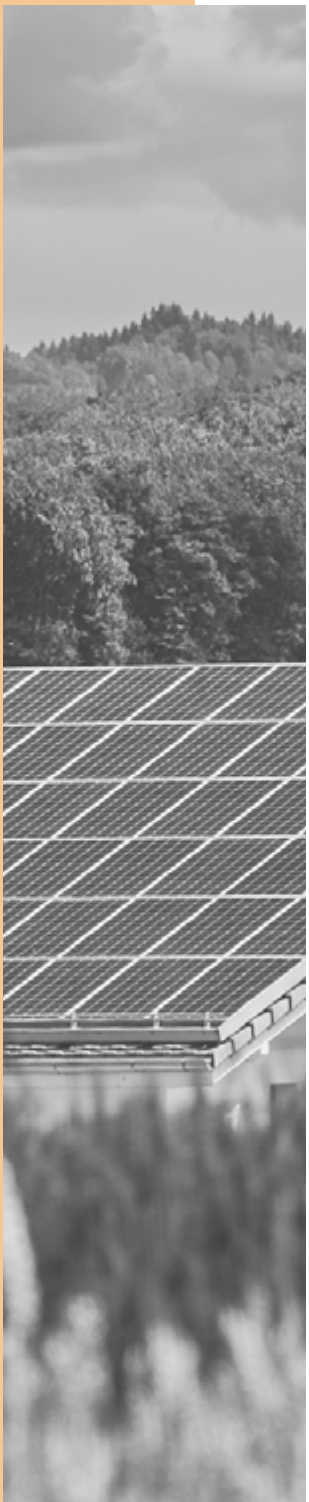
# 1 INTENT OF GUIDE



Installation of large-scale solar energy arrays has been increasing rapidly across the Commonwealth of Massachusetts; many communities with limited capacity are having to address proposals for solar installations on forest and prime farm lands, and other lands that are identified as resource-rich.

The intent of this guide is to assist communities with the regulation and development of Solar Photovoltaic Installations by providing standards for their placement, design, construction, operation, monitoring, modifications, and removal; to protect public health, safety or welfare in accordance with M.G.L. c. 40A, § 3; to protect and preserve farmland, forests, and open space as promoted by the Commonwealth of Massachusetts; to protect the scenic, natural, and historic resources; and to provide adequate financial assurance for the eventual decommissioning of such installations.

Throughout, this document provides helpful resources and examples that communities can use to develop effective solar energy zoning regulations and policies.

# SOLAR PV IN MASSACHUSETTS 2

## SOLAR PV BASICS

Solar photovoltaic systems, commonly abbreviated as solar PV, are the primary technology used to harness solar energy for electricity production. Solar PV cells, made primarily from silicon, convert sunlight directly into electricity. Multiple cells are connected in a solar panel or module, in which the cells are encased in protective glass, metal, and/or plastic. Panels can be used individually or connected to form an array. Solar PV panels are a different technology from solar thermal panels, which are used to produce domestic hot water, or the concentrated solar power systems of the southwestern United States, which use mirrors to concentrate sunlight and heat water into steam to generate electricity.

In addition to solar PV panels, a solar PV system includes an inverter, which converts the direct current (DC) electricity generated by the panels into the alternating current (AC) electricity used for local transmission within the electric grid, and fed into homes and businesses. Other components include mounting structures, wiring to connect system components, meters, and additional electrical accessories. Some solar arrays, especially larger systems, may also include an energy storage system, typically in the form of a set of batteries. Because the amount of sunlight available to generate energy varies depending on the time of day, season of the year, and weather conditions, solar PV is a variable source of energy. Battery storage systems are therefore useful for moderating the flow of electricity into the grid, and allowing solar-generated electricity to be used even at night when the sun is not shining.

Due to their modularity, solar PV systems can vary greatly in size. The size of a solar array is typically described in terms of its capacity, which is a measure of the instantaneous power output of the array at top production (i.e, in full sun). It is usually measured in kilowatts (kW) or megawatts (MW), where 1 MW equals 1000 kW. In our region, small-scale systems used to power an individual home, business, or municipal facility tend to be less than 25 kW. Commercial-scale solar arrays, which sell power directly to the grid, are often 1 MW or greater in size. An average 1 MW array would cover approximately 4-5 acres of land.

In Massachusetts, most solar PV systems are distributed energy resources – small or medium-sized power sources that are connected to the lower-voltage distribution lines which provide power to residential and business customers. The current state solar incentive program limits the size of solar PV arrays eligible for incentives to 5 MW AC, and so, at present, that is the largest size project many municipalities may see proposed. However, in some cases, electricity utilities or other entities may find it economical to propose much larger, “utility-scale” projects, which are greater than 5 MW AC, and which may be connected directly to transmission lines rather than distribution lines.

It is important to note that the capacity of a solar PV system is different when measured in units AC versus units DC. The DC capacity of a solar array is a good indication of its size, and footprint on the landscape. The AC capacity of a solar array is an indication of the maximum amount of energy flowing from the array into the grid, after it has gone through the inverter. In the absence of energy storage, a typical DC to AC ratio for solar array capacity is about 1.25:1. However, with energy storage, that ratio can be significantly higher (close to 2:1), since excess electricity can be stored in batteries during the day, and released into the grid during the night, when the panels are not generating electricity. This means that a solar array with a capacity of 5 MW AC might be as large as 10 MW DC.

The annual generation of a solar array is a measure of the yearly energy output produced by the panels. It is typically measured in kilowatt-hours (kWh) or megawatt-hours (MWh). In New England, annual generation is approximately equal to the array's capacity (in DC) *14% * 8760 hours per year.

# STATE INCENTIVES FOR SOLAR PV DEVELOPMENT

The state of Massachusetts has implemented three successive programs to provide incentives for solar development, which have been overseen by the state Department of Energy Resources (DOER).

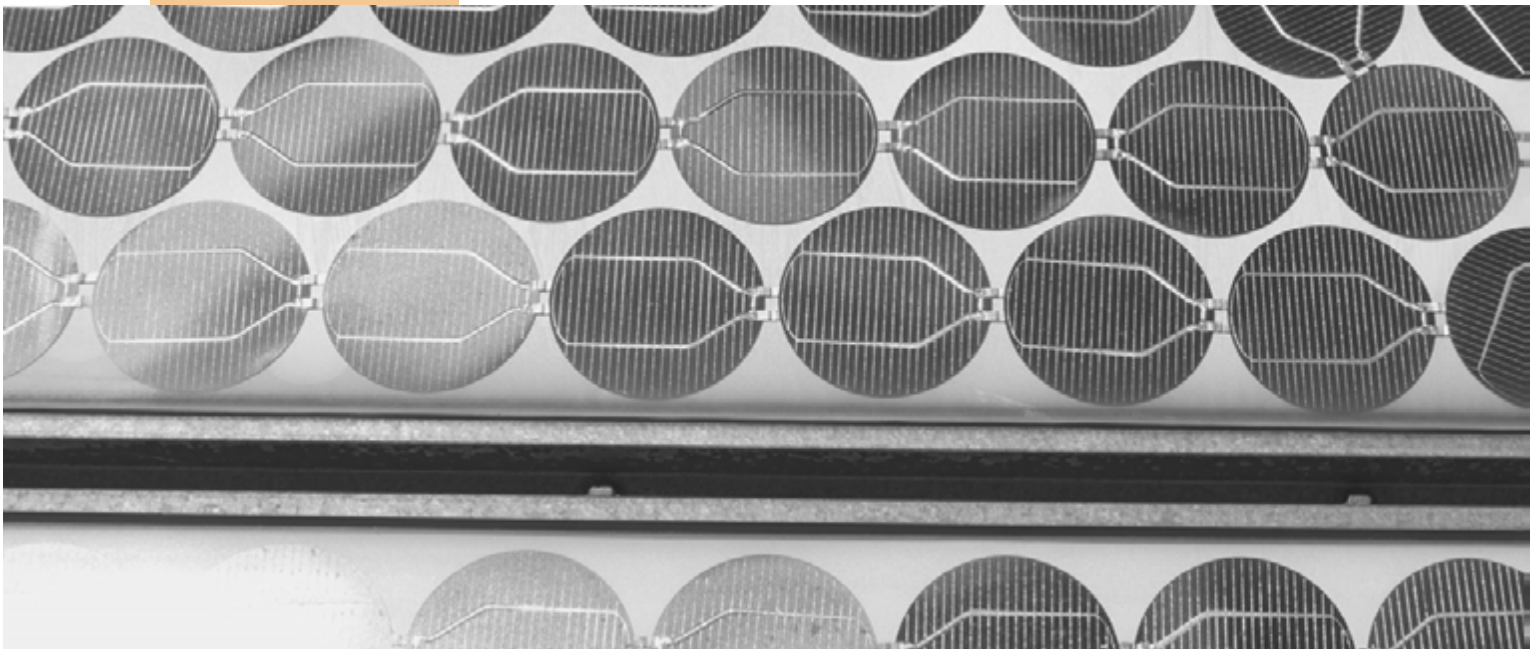
Under the **Solar Carve-Out** (2010-2013) and **Solar Carve-Out II** (2014-2018) programs, new solar PV systems within the state were eligible to qualify for Solar Renewable Energy Credits (SRECs). SRECs were issued to system owners based on how much electricity their solar panels generated; depending on the size and type of PV system, the system owner would earn up to 1 SREC for each MWh of power generated by the solar array. Systems that qualified under these programs could earn SRECs for a period of 10 years from the date they are first interconnected and operational. Utility companies which supply electricity to Massachusetts are required to purchase a certain number of SRECs every year, which they tend to do in bulk at auction. DOER sets a floor and ceiling on the auction price for SRECs, with prices that decline by a small percentage each cycle. After 10 years of operation, solar systems built under these programs no longer earn SRECs, but continue to be eligible for renewable energy credits (RECs), as well as generating saleable electricity for the system owner. RECs are worth less than SRECs, but can still be aggregated and sold at auction to utility companies. **About 2,100 MW of solar PV capacity were installed in the state under these two programs.**

In November 2018, the Solar Carve-out II program was replaced by the **Solar Massachusetts Renewable Target Program,** or **SMART**. The SMART regulation provides incentives in the form of direct “tariff” payments to the system owner for each kWh of power generated, with credit for the renewable content of the electricity going directly to the utility company in the form of RECs. SMART provides a base compensation incentive rate for solar arrays, based on system size, utility service area, and timing of entrance into the program. Additional incentives are available for projects located on buildings, parking lot canopies, landfills, brownfields, and "dual-use" solar and agriculture projects, as well as certain types of projects that benefit public entities, like municipalities, or that provide lower-cost electricity to multiple customers (“community-shared”). The SMART program initially was designed to provide incentives for 1,600 MW of solar development. The program was subject to an emergency regulation in April 2020, which further expanded the program to a total of **3,200 MW**.

The updated regulation places restrictions on what types of large, ground-mounted projects can receive incentives when they are sited on undeveloped land designated as BioMap2 Critical Natural Landscapes or Core Habitat by the state MassWildlife Natural Heritage and Endangered Species Program.

# FUTURE SOLAR DEVELOPMENT IN MASSACHUSETTS

As part of the 2008 Global Warming Solutions Act, Massachusetts set mandated greenhouse gas emission reduction targets, including an 80% reduction in emissions relative to 1990 levels by 2050. In order to reach these goals, large amounts of renewable electricity-generating capacity will have to be added to the New England grid, with solar photovoltaic (PV) systems representing a significant portion of that added capacity. But how much solar PV capacity will ultimately be needed? The state of Massachusetts has set short-term targets for solar PV development, such as the 3,200 MW cap established for the SMART solar incentives program. However, the state currently has no long-term vision of how much solar will ultimately need to be developed. Of course, future electricity needs are impossible to predict exactly, and the changing economics of other types of technologies – particularly offshore wind – will play an important role in the mix of renewable sources that will power the electric grid in the future.



Nevertheless, a number of organizations have conducted economic and energy modeling to estimate how much solar PV capacity may ultimately be needed to help power a clean grid in Massachusetts.

- The **Stanford Solutions Project**[1] estimates **38.4 GW** of solar PV will be needed statewide to achieve 100% renewable fuel use across Massachusetts, including electrified heating and transportation sectors. Under this scenario, 29.5% of Massachusetts electricity comes from solar.
- The **Brattle Group**[2] estimates about 107 GW of solar PV must be built across New England to achieve an 80% reduction in greenhouse gas emissions for the region. Massachusetts represents about 46% of New England electricity use, so could be considered responsible for up to **50 GW** of solar PV development – although wind development off the coast of Massachusetts will also represent an important portion of the state's contribution to the New England electricity supply. Under this scenario, solar would provide 37% of electricity generation.
- The **National Renewable Energy Laboratory**[3] estimates 715 GW of solar PV are needed nationwide by 2050 to achieve 27% of electricity generation from this source. Massachusetts is envisioned to contribute **10-30 GW** to this total.

The state of Massachusetts currently has about 2.5 GW of solar installed. In order to reach the capacity levels described above, solar capacity would need to expand to 4-20 times what it is currently. Therefore, we can expect to see continued pressure for solar development in coming decades..

[1] Delucchi, M.A., M.Z. Jacobson, G. Bazouin, and Z.A.F. Bauer, 2015. Spreadsheets for 50-state 100% wind, water, and solar roadmaps, http://web.stanford.edu/group/efmh/jacobson/Articles/I/WWS-50-USState-plans.html

[2] Weiss, J. and J.M. Hagerty, 2019. Achieving 80% GHG reduction in New England by 2050, https://brattlefiles.blob.core.windows.net/files/17233_achieving_80_percent_ghg_reduction_in_new_england_by_20150_september_2019.pdf

[3] SunShot, E.E., US Department of Energy, 2012. SunShot Vision Study: February 2012. NREL Report No. BK5200-47927. DOE/GO–102012-3037.

# 3 DEVELOPING OR UPDATING A SOLAR BYLAW OR ORDINANCE

## DEFINING A CLEAR PROCESS

**A municipal solar bylaw or ordinance** should proscribe the process for solar array development and operation within the community, from initial permitting, to site clearing and construction, to annual maintenance, management, and reporting, and through eventual decommissioning. The bylaw or ordinance should be thorough and lay out a clear process, so as to provide clarity to both the solar developer and solar PV system owner (if the facility changes hands), as well as to board members reviewing the project.

However, because any amendments to a zoning bylaw or ordinance require approval at Town Meeting or by Town or City Council, it may also be wise to allow sufficient flexibility in the bylaw or ordinance to permit updates to minor components of the permitting process without amending the bylaw.

After reviewing several proposed projects, the Site Review Approval Authority (typically the Planning Board or Zoning Board of Appeals) may recognize that there are additional types of documents or specific information which would be of use in reviewing future applications. A municipality's Site Plan Review Rules and Regulations can lay out the requirements that could be provided in a typical application. Keep in mind that requirements for construction, maintenance, or reporting relevant to a specific site could be put into the final conditions associated with the permit for that project, rather than included in a bylaw, ordinance governing all projects. See *Appendix A* for an example. Rules and regulations can be adopted by the Site Plan Authority with a majority vote during an appropriately advertised Public Hearing.

# PLANNING FOR SOLAR DEVELOPMENT IN YOUR COMMUNITY

Solar development is coming to represent a large source of new development in many Massachusetts communities. Mass Audubon's 2020 *Losing Ground* report estimated that solar development has represented as much as a quarter of all new land development in the state in recent years. As noted in *Section 2* of this guide, significant additional solar development is necessary in Massachusetts over the coming decades, if the state is to meet its mandated greenhouse gas emission reduction goals. With this in mind, communities may wish to conduct specific planning for solar development, and to develop solar zoning bylaws that are compatible with these plans. As detailed below, municipalities cannot "unreasonably" regulate or restrict solar development, but bylaws can be designed to guide development towards certain locations or certain types of projects. For example, many municipalities allow as-of-right siting of solar PV development on former landfill properties; others streamline development of building-mounted and parking lot canopy arrays by requiring only a building permit for their construction.

There is not currently a template to guide municipal-level solar development planning in Massachusetts, but the UMass Clean Energy Extension is working with a diverse team to create just such a document, which will be completed in mid-2021. In the meantime, existing municipal planning documents - such as a Master Plan or Open Space & Recreation Plan - can help identify where a community prefers to see, and prefers not to see, solar development. Hazard Mitigation Plans can also help to identify where a community could benefit from solar development paired with energy storage, potentially allowing for electrical power at an emergency shelter during a black-out. Where there are appropriate sites for solar development on public land or with willing private landowners, communities can consider taking a proactive approach, actively soliciting proposals for development of a site, rather than solely responding to permitting applications from developers.

# STATE REQUIREMENTS REGARDING SOLAR BYLAWS AND ORDINANCES

## PROTECTION FROM "UNREASONABLE" REGULATION

Massachusetts General Laws (MGL) Chapter 40A, Section 3, protects solar energy systems and the building of structures that facilitate the collection of solar energy as follows:

*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.*

The challenge in interpreting this statement lies in defining what constitutes "unreasonable" regulation of solar, and what requirements are necessary to protect the public welfare. In the review of new solar bylaws performed by the Massachusetts Attorney General's Office, the office frequently comments:

*There are no court decisions to guide the Municipality and this Office in determining what qualifies as an unreasonable regulation of solar uses in contravention of G.L. c. 40A, § 3. However, the Municipality should be mindful of this requirement in applying the amendments adopted and consult closely with Town Counsel during the process.*

The Massachusetts Department of Energy Resources (DOER) model solar bylaw/ordinance also addresses this statute, and notes the lack of court precedent in defining "unreasonable" regulation:

*Although these systems must be allowed within the community, they may be regulated where necessary to protect public health, safety or welfare through other provisions of the Zoning Bylaw/Ordinance. For example, these systems will still need to meet dimensional regulations and other performance standards necessary to protect public health, safety or welfare. In addition, a Site Plan Review process may be used to collect information that will ensure compliance with the performance standards in the Zoning Bylaw/Ordinance. Where some communities include Design Review in their permit processes, these communities will need to balance their desire for certain design objectives with the Commonwealth's protection of solar energy systems. Finally, this suggested bylaw/ordinance document requires a special permit for a large-scale ground-mounted facility in a residential district and prohibits such systems in another residential district. While a special permit is discretionary, and language expressing uncertainty and cautioning communities about the lack of case law regarding Chapter 40A Section 3 has been included, the Attorney General's Office has approved local zoning using this permitting mechanism.*

*While DOER cannot offer a definitive interpretation, limited use of special permits when applied to the largest of solar systems, especially when these systems are allowed elsewhere by right, may well be reasonable regulation. In DOER's view, given the plain language of the statute, it is prudent to allow opportunity to site all scales of solar energy systems somewhere in the community.*

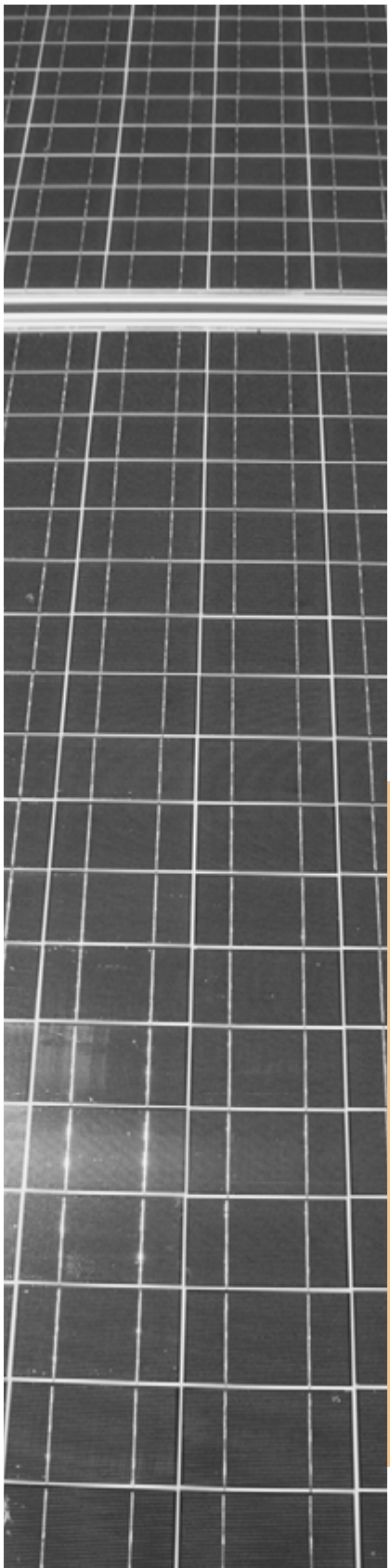
This guide and the model bylaw/ordinance language provided herein have been constructed based on existing solar bylaws that were reviewed by the respective municipal counsels of the municipalities that implemented them. Approved bylaws and ordinances have placed constraints on where and how solar arrays can be built, including limits on forest clearing, maximum grades of slope where solar can be developed, and property line setbacks. However, it is important to recognize that there remains little clear guidance on what constitutes "unreasonable" regulation. Further, it is possible that reasonable regulation could be context-dependent. For example, barring forest clearing from more than 2 acres of land may eliminate the potential for most solar development on 90% of potential sites in a town that is heavily forested, while not doing so in another municipality with more unforested land. The constrictions imposed by specific siting requirements are worth considering carefully in development of a municipal solar zoning bylaw or ordinance.

## PROTECTION OF AGRICULTURAL ENERGY SYSTEMS

Massachusetts General Laws (MGL) Chapter 40A, Section 3, provides further protection of certain solar photovoltaic systems that are built for the exclusive purpose of providing electricity for agricultural activities on a property that is primarily in agricultural use (where solar is accessory to the agricultural use). In this case, the system may not be prohibited, unreasonably regulated, or require a special permit.

*No zoning ordinance or by-law shall … prohibit, unreasonably regulate, or require a special permit for the use of land for the primary purpose of commercial agriculture, aquaculture, silviculture, horticulture, floriculture or viticulture,* ***nor prohibit, unreasonably regulate or require a special permit for the use, expansion, reconstruction or construction of structures thereon for the primary purpose of commercial agriculture, aquaculture, silviculture, horticulture, floriculture or viticulture…***

Note that this law does not exempt a proposed solar PV system from regulation, but indicates it must not require a special permit to build– that is, that it must be allowed as-of-right, but can be subject to site plan review to ensure it meets relevant laws and is eligible for issuance of a building permit. In order to be eligible for this protection, the property on which the project is sited must meet specific requirements in terms of commercial agricultural sales and parcel size, which are further detailed in Section 3. See additional resources in the appendix for questions on the applicability of agricultural exemption to specific solar energy systems. (*See Appendix B*)



## GREEN COMMUNITIES STATUS

Many towns and cities across the Commonwealth participate in the Green Communities program, which assists municipalities in setting and achieving goals for energy efficiency. One of the five criteria to earn designation as a Green Community is passage of a zoning bylaw related to renewable energy which provides for as-of-right siting of at least one type of renewable energy manufacturing or generation facility in at least one zoning district or designated location, as follows:

*To qualify as a green community, a municipality or other local governmental body shall…provide for the as-of-right siting of renewable or alternative energy generating facilities, renewable or alternative energy research and development facilities, or renewable or alternative energy manufacturing facilities in designated locations.*

This criterion is relatively straightforward to fulfill and maintain. For example, it could be met by allowing as-of-right siting of residential-scale solar arrays in a zoning district, or establishing a solar overlay district which allows for siting of commercial-scale solar development on one or more parcels in town. It does not prohibit inclusion of site plan review in the as-of-right process.

## IMPOSING A TEMPORARY SOLAR MORATORIUM

In some communities, the municipality need may arise to pass a temporary moratorium on the development of large-scale solar systems, to allow the municipality time to update and modernize its existing solar bylaw. This can be done by putting into place a temporary moratorium for a period of up to 12 months.

It is important to present to the community and the Attorney General's Office if you have Town Meeting, that there is a reasoning behind adopting a temporary solar moratorium. For example, understanding the impacts of solar development on prime farmland, especially if the community had just approved multiple solar projects.

**See Appendix C for Example Moratorium Bylaw/Ordinance**

# 4 COMPONENTS OF A MUNICIPAL SOLAR BYLAW OR ORDINANCE

This section and the following sections (5-12) describe nine components that we recommend be included in any municipal solar bylaw or ordinance: ***Purpose; Applicability***; ***Definitions***; ***Standards for Small-Scale Solar Arrays***; ***Site Plan Approval***; ***Site Plan Review Standards***; ***Construction, Maintenance, Monitoring, and Modifications***; ***Discontinuance and Removal***; ***Financial Surety***.

Each section provides a basic overview of the importance of that bylaw or ordinance component, followed by example language. In some cases, we provide language that we recommend be included in any solar regulation. In other cases, municipalities have taken different approaches, and we provide alternative language to address the issue at hand. Finally, we also include language regarding optional provisions that a municipality may wish to consider including. Depending on the format of the municipality's existing zoning bylaws or ordinance, the language provided herein may be incorporated as a stand-alone section, or included piecemeal in the appropriate sections of the zoning regulations.

## SAMPLE BYLAW/ ORDINANCE LANGUAGE

### COMPONENTS OF BYLAW/ORDINANCE TYPICALLY IN THE *PURPOSE* SECTION AND SAMPLE LANGUAGE

**A. Purpose.** The purpose of this bylaw (or ordinance) is to provide for the construction and operation of solar energy facilities and to provide standards for the placement, design, construction, monitoring, modification and removal of solar facilities that address public safety, minimize impacts on scenic, natural and historic resources of the town (or city) and provide adequate financial assurance for decommissioning.

Additionally, the solar energy facilities shall be consistent with community planning documents including but not limited to the Town's (or City's) Open Space and Recreation Plan or Master Plan

The provisions set forth in this section shall take precedence over all other sections when considering applications related to the construction, operation, and/or repair of solar energy facilities.

# 5 APPLICABILITY

**Solar projects range in size**, from residential-scale arrays sited on top of a home roof or in the backyard, to large commercial solar array installations covering multiple acres of land.

Under the State Zoning Act, solar PV arrays can be allowed As-of-Right (with a building permit only), allowed As-of-Right (with Site Plan Review), or approved through a Special Permit (with Site Plan Review). Because the size of these systems can vary so greatly, municipalities often choose to regulate different sizes or types of systems differently. Examples include allowing roof-mounted units As-of-Right (with a building permit only), while requiring a Special Permit for the construction of commercial-scale arrays in certain zones. As described above in Section 3, the State Zoning Act also protects developers from “unreasonable regulation” of solar development in your city or town.

The contents of this section can apply to a primary use of property or an accessory use, whether the solar array is providing energy for on-site use, or selling power directly to the grid.

## AS-OF-RIGHT VS. SPECIAL PERMIT

As-of-Right and Special Permit zoning are applicable to many kinds of development, not just solar PV systems. Both permitting processes can incorporate Site Plan Review (SPR), but the outcomes of that review differ.

**As-of-Right Siting** means that development may proceed without the need for a special permit, variance, amendment, or other discretionary approval. As-of-right development may be subject to non-discretionary Site Plan Review to determine conformance with local zoning bylaws as well as state and federal law. As-of-right zoning bylaws or ordinances can apply appropriate standards that protect public health and safety. Reasonable environmental performance standards per the developed bylaw or ordinance may be incorporated into the Site Plan Review process (e.g. height, setback, etc.), but cannot be so stringent as to make the use infeasible. The key is that Site Plan Review must be truly non-discretionary – *i.e., if the standards and zoning requirements are met, the project can be built*. In this context, Site Plan Review can only be used to shape a project; it cannot be used to deny a project, except in rare circumstances. As-of-right development projects that are consistent with zoning bylaws and ordinances and with state and federal law cannot be prohibited.

This is distinct from the **Special Permit (SP)**. In the special permit process, the full range of discretion is available to the special permit granting authority:

*Neither the Zoning Enabling Act nor the town zoning bylaw gives…an absolute right to the special permit…The board is not compelled to grant the permit. It has discretionary power in acting thereon. MacGibbon v. Board of Appeals of Duxbury, 356 Mass. 635, 638-639 (1970).*

The Special Permit may be denied if the Planning Board or other permit granting authority is not satisfied with the project.

## DEFINING SOLAR ARRAY SIZE AND TYPE

As noted above, many municipalities choose to regulate solar PV arrays of different sizes differently, typically differentiating between “small,” “medium,” and “large” projects. Municipalities have taken different approaches to defining the size of solar installations. Options for defining project size include:

1. Project Capacity: The total wattage of the solar installation in kW or MW DC. (See *Section 2*, Solar PV Basics for a definition of project capacity).
2. Solar Panel Area: The total area of solar panels, typically in square feet.
3. Project Footprint: The total footprint of the project, typically in square feet for small and roof-mounted installations, and in acres for larger projects.

Of course, these three definitions of solar array size are related, but may vary with project type and over time. For example, as solar PV panels become more efficient, less space will be required to provide a project with the same capacity.

As a rough rule of thumb for roof-mounted projects, 100 square feet of roof space is required per 1.6 kW of solar. For smaller projects, there may not be a great discrepancy between the solar panel area and project footprint. However, large ground-mounted projects require multiple components, including, but not limited to: the solar PV system, spaces between rows of panels, cleared buffers, access and maintenance roads, and a utility interconnection site. Traditional ground-mounted arrays provide roughly 200-250 kW per acre, equivalent to roughly 18,000 square feet of panels. Parking lot canopies provide roughly 263 kW per acre, equivalent to roughly 18,936 square feet of panels.

In addition to distinguishing between projects of different sizes, some municipalities choose to differentiate among projects based on type – such as roof-mounted systems, ground-mounted systems, or parking lot canopies.

However defined, these categories should be included in the **Definitions** section of the zoning bylaw or ordinance (see next section, *Section 6*).

## RECOMMENDATIONS

- As-of-Right (building permit) – Allowing rooftop installations and small, residential-scale ground-mounted projects as-of-right in all zoning districts will streamline the permitting process, encouraging local solar projects and minimizing staff or Board review time. Defining what constitutes a small-sized solar energy project will clarify which systems may proceed straight to obtaining a building permit.
- As-of-Right (with Site Plan Review) – Allowing large rooftop installations and medium-scale, ground-mounted projects as-of-right, but subject to site plan review, will lay out the requirements for a straightforward and streamlined permitting process, while allowing Board review to ensure projects are meeting state and local standards.
- Special Permit (with Site Plan Review) – Municipalities may choose to allow large-scale projects to proceed either through an As-of-Right or Special Permit process with Site Plan Review, depending on degree of flexibility and control desired within the municipality.
- Project Size – Solar array project sizes should be defined relevant to the manner in which they are regulated, and these definitions should be included in the Definitions section of the bylaw (*see* Section 6 *of this document*). We recommend including a definition for projects that require Site Plan Review. In this guide, we refer to these systems as Commercial Solar Photovoltaic Installations (CSPIs), and define them as solar installations with a minimum rated nameplate capacity of 250 kW DC – equivalent to about 1 acre in project footprint.

# SAMPLE BYLAW/ORDINANCE LANGUAGE

## COMPONENTS OF BYLAW/ORDINANCE TYPICALLY IN THE *APPLICABILITY* SECTION AND SAMPLE LANGUAGE

***The bylaw or ordinance should define which types of projects are allowed as-of-right (with issuance of a building permit), as-of-right (with site plan approval), and by special permit. Example language is provided below.***

**A. As-of-Right:** The following solar photovoltaic installations, as defined herein, are allowed as of right with issuance of a valid building permit from the building inspector in all zoning districts:

1. Any such roof-mounted installation on an existing structure. *[Note that a maximum capacity could be listed to limit the size of roof-mounted project requiring only a building permit.]*
2. Any such ground-mounted installation less than or equal to 25 kW DC in capacity.

**B. As-of-Right:** The following solar photovoltaic installations, as defined herein, are allowed as of right with site plan approval in all zoning districts:

1. Any ground-mounted installation greater than 25 kW DC over an existing parking surface, pedestrian walkway, or other paved area in a manner that maintains the function of the area beneath the canopy. *[Note that some municipalities allow parking lot canopies as of right with issuance of a building permit in order to streamline development.]*
2. Any other ground-mounted installation greater than 25 kW DC but less than 250 kW DC in capacity.

**C. Special Permit:** Any solar photovoltaic installation not specified in (A) or (B) requires a special permit in all zoning districts from the Special Permit Granting Authority. For all special permit applications, site plan approval as described below is required, but shall not require a second public hearing, per bylaw or ordinance addressing site plan approval.

**The municipality may also choose to limit solar PV projects based on size or location. Additionally, a community may also choose *Special Permit* versus *Site Plan Approval* thresholds based on their own values since impacts tend to increase on sites of more than one acre. Example language is in *Section 6 Definitions*. Note that the number values provided (maximum acreage for array, maximum forest clearing, maximum slope) are provided as examples only, and should be determined based on the community values, land use, and topography of your municipality.**

**D. Not Permitted:** No commercial solar photovoltaic installation may be permitted as follows:

1. Any solar photovoltaic installation of greater than 20 acres of previously undeveloped land in a fenced array area.
2. Any solar photovoltaic installation requiring forest clearing greater than ten acres.
3. Any solar photovoltaic installation on slopes of 15% or greater as averaged over fifty horizontal feet; the Special Permitting Granting Authority may consider waiving this up to 18% based on site-specific parameters. No cutting or filling may be done to reduce natural slopes.

# DEFINITIONS 6

**Zoning codes** can sometimes fail to identify and define specific terms and types of solar energy systems. The lack of clear definitions can lead to future misinterpretation and create uncertainty about the legality of solar use.

Typical definitions related to solar development are provided on the next page; these can be adopted into a solar bylaw or ordinance.

***These definitions should be placed in a general definitions section of the municipal bylaw or ordinance.***

**GROUND-MOUNTED SOLAR PHOTOVOLTAIC INSTALLATION**: A solar photovoltaic installation that is directly mounted to structural supports on the ground and not mounted on a roof or other previously existing structure.

**RATED NAMEPLATE CAPACITY**: The maximum rated output of electric power production of the commercial solar photovoltaic installation in Direct Current (DC).

**SITE PLAN APPROVAL AUTHORITY**: The site plan approval authority as designated by the Zoning Guide.

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

**SOLAR PHOTOVOLTAIC INSTALLATION**: A solar energy system that converts solar energy directly into electricity through an arrangement of solar photovoltaic panels.

As noted in Section 5, it is often appropriate to include definitions of solar PV array system sizes in the bylaw/ordinance, as they relate to how different systems are regulated (e.g. as-of-right or by special permit). Also as described in Section 5, project size can be defined by solar PV system capacity (kW DC), the area occupied by solar PV panels, or the project footprint. Examples of these different ways of defining project size are provided below and on the following page. Note that the number values provided (maximum nameplate rated capacity, maximum surface area of panels, maximum project footprint) are provided as examples only, and should be determined based on the different regulatory pathways for different project sizes, and your community's values and vision for the land.

## Capacity

**SMALL-SCALE GROUND-MOUNTED SOLAR PHOTOVOLTAIC INSTALLATION:** A Ground-Mounted Solar Photovoltaic Installation with a rated nameplate capacity of 25 kW DC or less.

**MEDIUM-SCALE GROUND-MOUNTED SOLAR PHOTOVOLTAIC INSTALLATION**: A Ground-Mounted Solar Photovoltaic Installation with a rated nameplate capacity greater than 25 kW DC but less than or equal to 250 kW DC.

**COMMERCIAL SOLAR PHOTOVOLTAIC INSTALLATION (CSPI)**: A Ground-Mounted Solar Photovoltaic Installation with a rated nameplate capacity greater than 250 kW DC.

## Solar Panel Area

**SMALL-SCALE GROUND-MOUNTED SOLAR PHOTOVOLTAIC INSTALLATION:** A Ground-Mounted Solar Photovoltaic Installation that occupies 2,100 square feet or less of surface area of solar panels.

**MEDIUM-SCALE GROUND-MOUNTED SOLAR PHOTOVOLTAIC INSTALLATION**: A Ground-Mounted Solar Photovoltaic Installation that occupies more than 2,100 but less than 32,000 square feet of surface area of solar panels.

**LARGE-SCALE GROUND-MOUNTED SOLAR PHOTOVOLTAIC INSTALLATION**: A Ground-Mounted Solar Photovoltaic Installation that occupies 32,000 square feet or more of surface area of solar panels.

## Project Footprint

Size requirements regarding project footprints are often provided as alternatives tot he nameplate capacity definition. For example:

**MEDIUM-SCALE GROUND-MOUNTED SOLAR PHOTOVOLTAIC INSTALLATION:** A Ground-Mounted Solar Photovoltaic Installation with a rated nameplate capacity greater than 25 kW but no more than 250 kW and that occupies no more than 40,000 square feet of surface area.

**-OR-**

**MEDIUM-SCALE GROUND-MOUNTED SOLAR PHOTOVOLTAIC INSTALLATION:** A Ground-Mounted Solar Photovoltaic Installation with a rated nameplate capacity greater than 25 kW but no more than 250 kW and does not occupy more than one (1) acre of land.

**LARGE-SCALE GROUND-MOUNTED SOLAR PHOTOVOLTAIC INSTALLATION**: A Ground-Mounted Solar Photovoltaic Installation with a rated nameplate capacity greater than 250 kW or that occupies more than one (1) acre of land.

# 7 STANDARDS FOR SMALL-SCALE SOLAR ARRAYS

The majority of this guide addresses commercial-scale solar photovoltaic systems. For roof-mounted and small-scale ground-mounted solar PV system, the the DOER model bylaw does provide the following recommendations regarding standards.

A. All Small and Medium-Scale Solar Photovoltaic Installations shall adhere to the following Design and Operation Standards.

1. Utility Notification. No grid-intertie photovoltaic system shall be installed until evidence has been given to the Site Plan Review Authority that the owner has submitted notification to the utility company of the customer's intent to install an interconnected customer-owned generator. Off-grid systems are exempt from this requirement.

2. Emergency Access. Solar energy systems shall be located in such a manner as to ensure emergency access to the roof, provide pathways to specific areas of the roof, provide for smoke ventilation opportunities, and provide emergency egress from the roof.

a. For buildings with pitched roofs, solar collectors shall be located in a manner that provides a minimum of one three-foot wide clear access pathway from the eave to the ridge on each roof slope where solar energy systems are located as well as one three-foot smoke ventilation buffer along the ridge.

b. Residential rooftops that are flat shall have a minimum three-foot wide clear perimeter and commercial buildings that are flat shall have a minimum four-foot wide clear perimeter between a solar energy system and the roofline, as well as a three-foot wide clear perimeter around roof-mounted equipment such as HVAC units.

c. To the extent practicable, the access pathway shall be located at a structurally strong location on the building (such as a bearing wall).

Building and Fire Department personnel should be involved in the development of emergency access standards, and any zoning standards that are adopted should be consistent with local building and fire codes.

3. Safety. No roof-mounted solar energy system shall be located in a manner that would cause the shedding of ice or snow from the roof into a porch, stairwell or pedestrian travel area.

# SITE PLAN APPROVAL 8

This section presents regulations that the municipality may choose to include in a bylaw or ordinance in a site plan review setting, either in coordination with as-of-right siting or a special permit, as described in Section 5.

The contents of this section are intended to apply to large-scale solar photovoltaic installations, however they may be defined in your municipality. For the purposes of this guide, we refer to these installations as Commercial-Scale Solar Photovoltaic Installations, or CSPIs, defined as solar photovoltaic installations with a minimum capacity of 250 kW DC, equivalent to about 1 acre in project footprint for a ground-mounted installation. The contents of this section also apply to modifications that materially alter the type, configuration, or size of these installations or related equipment. **If the Applicability portion of your bylaw requires Site Plan Review for Medium-Scale Solar PV Installations (e.g. less than 250 kW DC), you may wish to identify an abbreviated list of requirements for these smaller-scale projects.**

## THE PERMITTING TIMELINE & INTERCONNECTION

Local permitting is one of many administrative steps that solar developers must go through in order to develop and build a commercial-scale solar facility. Where municipal permitting falls in the administrative process is dependent to an extent on utility and state requirements, but can also be influenced by what documentation municipal boards require in the permit application, and what steps in the process are required to be completed before the project proponent comes before the municipal board.

Municipalities that require numerous documents may receive applications for projects that are later in the process and have already received approvals from other entities. The advantage here is that the developers are serious in their intent to move forward with project development. The disadvantage is that the project is later in the design phase, it may be more constrained by approvals that have already been received, and developers may be less open to local concerns that could modify the project plan. In addition, the project proponents will have sunk significant funds into development of the project, and be more adamant (and potentially litigious) in ensuring the project moves forward.

The alternative is to allow projects to come before municipal boards before they have received approvals from other entities. The advantage here is that the project developers may be more open to modifications that address local concerns. One disadvantage is that many solar projects that go through the initial stages of development are never built; hence, significant volunteer and staff time may be wasted reviewing projects that never progress. In addition, projects that do progress may have to come back before a municipal board for approval of modifications made based on review by other entities.

Some municipalities require documentation that a commercial-scale project is at a specific stage in the interconnection process before it may come before a municipal board for review. Interconnection is the process via which a solar PV facility receives permission from the utility and connects to the electric grid. As a first step, the system developer must submit an application to obtain formal written approval from the local utility. For commercial-scale systems, once the utility has determined that an application is complete, the utility typically requires that the developer pay for a study to establish the impacts of interconnection of the facility to the grid system, and to determine if upgrades are required before interconnection can occur. The utility and developer then commit to an *Interconnection Service Agreement* (ISA) for the project, which includes a requirement for the developer to cover the cost of system upgrades. After the project has been built, the developer then submits to receive an *Authorization to Connect*.

# SAMPLE BYLAW/ORDINANCE LANGUAGE

## COMPONENTS OF BYLAW/ORDINANCE TYPICALLY IN THE *SITE PLAN APPROVAL* SECTION AND SAMPLE LANGUAGE

Municipalities may want to identify specific standards or criteria for the site plan approval of solar photovoltaic installations and its related application requirements. Suggestions below may or may not be appropriate for your community.

**A. Site Plan Approval.** The construction, installation or modification of a ground-mounted solar photovoltaic installation, whether as-of-right or by special permit, shall be subject to site plan approval by the Site Plan Approval Authority in accordance with the Applicability Section of the zoning bylaw.

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

2. Required Documents. The project proponent shall provide the following documents:

a. A site plan showing:

i. An existing conditions plan with property lines and physical features, including topography and roads, characteristics of vegetation (trees-mature, old growth, shrubs, open field, etc), wetlands, streams, ledge, for the project site;

ii. Proposed changes to the landscape of the site, including grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures, driveways, snow storage, and storm water management systems; including total acreage of disturbed area, total vegetation cleared, not including mowed fields;

iii. Trees with a DBH of 20" or greater within project parcel(s) shall be identified to determine tree loss, along with inventorying of diseased or hazard trees slated to be removed due to proposed development;

iv. 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;

v. 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;

vi. Documentation of the major system components to be used, including the PV panels, mounting system, and inverter;

vii. Name, address, and contact information for proposed system installer;

viii. Name, address, phone number and signature of the project proponent, as well as all co-proponents or property owners, if any;

ix. The name, contact information and signature of any agents representing the project proponent.

If the following are not addressed in general site plan review regulations for all types of development, then the community may wish to include them for CSPIs specifically:

x. Locations of active farmland and prime farmland soils, wetlands, 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.

xi. Locations of floodplains or inundation areas for moderate or high hazard dams;

xii. Locations of local or National Historic Districts.

xiii. Stormwater management and erosion and sediment control (*See discussion under Chapter 10*)

Further recommended language regarding Required Documents continues, as follows:

b. Documentation of actual or committed prospective access and control of the project site sufficient to allow for construction and operation of the proposed solar photovoltaic installation.

c. A plan for the operation and maintenance of the solar photovoltaic installation as detailed in A(3): Operation and Maintenance Plan.

d. Proof of liability insurance.

e. Description of financial surety that satisfies Financial Surety.

f. Pre-construction photos from the right-of-way and nearest abutters. These photos should include tree coverage.

g. Zoning district designation for the parcel(s) of land comprising the project site.

h. Visualization of post-construction solar development, including perspectives from right-of-way(s), nearest abutting properties or residential structures, and tree coverage. The Site Plan Approval Authority may determine additional visualizations to be submitted for review.

i. Proof that the project proponent will meet the required Site Plan Review notification procedures.

***Required Document (i) above should reference the municipality's existing Site Plan Review public and/or abutter notification procedures, if applicable. For example, a community may require projects that are subject to Site Plan Review to notify all property owners within 100 feet of the project site.***

See Figures 8-1, 8-2 and 8-3 for an example of what site plan approval authorities may ask for applicants to submit to ensure minimal visual impact to abutters and protected corridors.

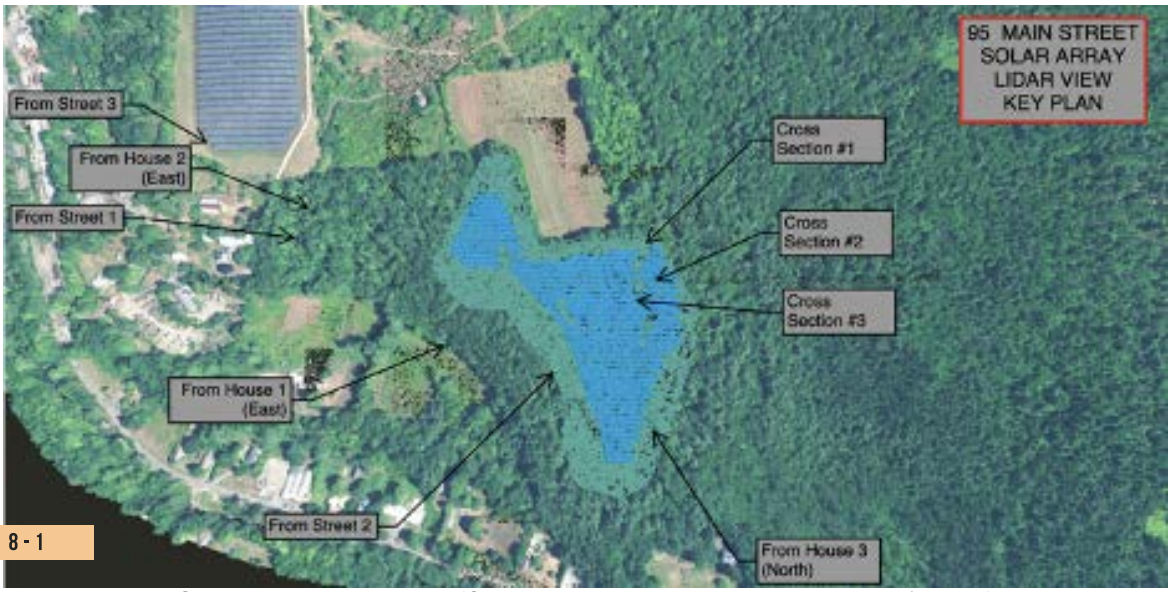



FIG. 8-1

Summary of Visualizations (Courtesy of Williamsburg Zoning Board of Appeals)

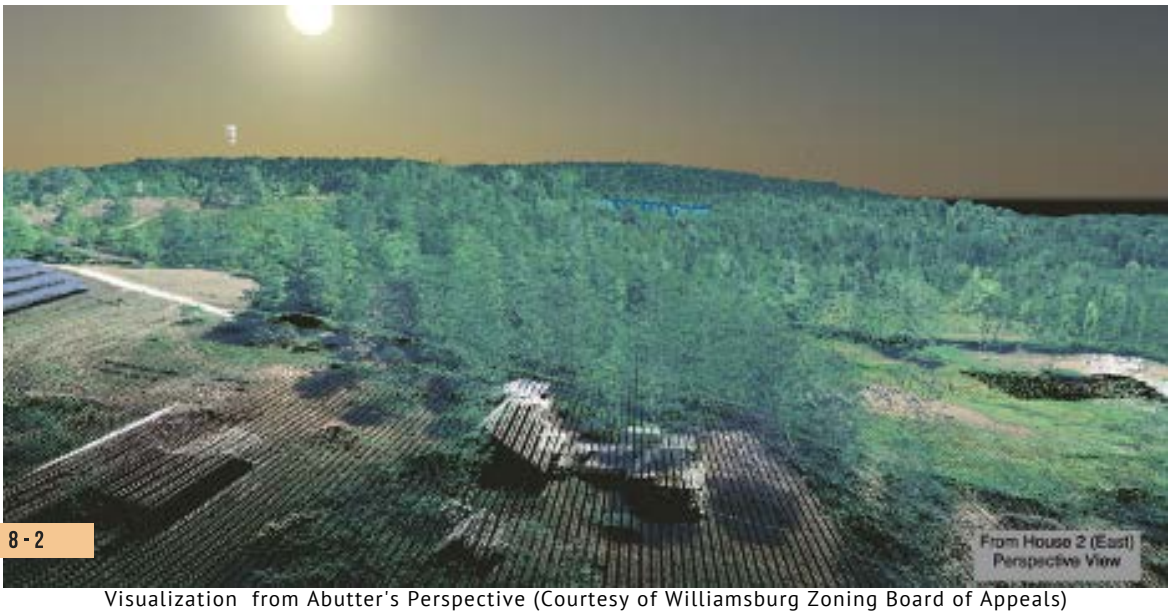



FIG. 8-2

Visualization from Abutter's Perspective (Courtesy of Williamsburg Zoning Board of Appeals)

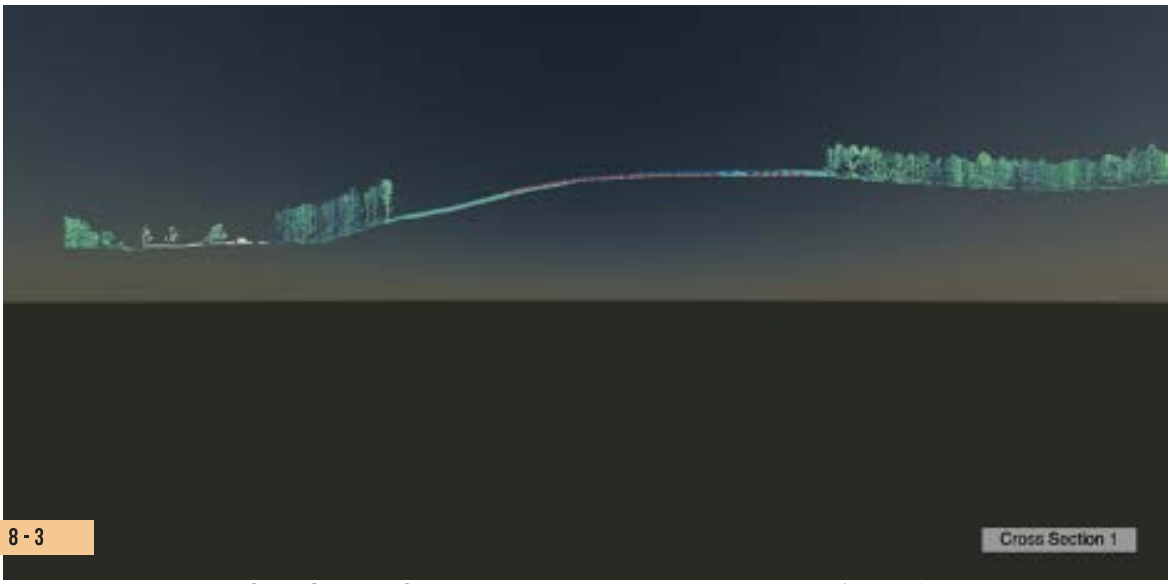



FIG. 8-3

Cross Section (Courtesy of Williamsburg Zoning Board of Appeals)

Further recommended Site Plan Approval language continues, as follows:

3. Operation & Maintenance Plan. This plan shall include measures to maintain safe access to the installation, stormwater controls, and general procedures for operational maintenance of the installation. The Operation & Maintenance Plan should include a training component and schedule for emergency services staff along with any designees the Site Plan Approval Authority deems necessary.

4. Waiver Requests. The Site Plan Approval Authority may waive documentation requirements as it deems appropriate upon written request of the applicant submitted with an application for approval.

The language below is one way to ensure coordination among all necessary boards, commissions, and departments, and avoid discrepancies in the approval process across separate municipal entities.

5. Consultation with Other Departments and Entities. No building permit shall be issued and no application for such permits shall be accepted for construction, exterior alteration, relocation, or change in use except where noted in Section X, unless a site plan has been endorsed by the Site Plan Approval Authority, after consultation with other boards, including but not limited to the following: Building Inspector, Board of Health, Select Board or Town/City Council, Historical Commission, Conservation Commission, Highway Department or DPW, Fire Department and Police Department. The Site Plan Approval Authority may waive any or all requirements of site plan review for external enlargements of less than 10% of the existing occupied area.

Further example language continues, as follows:

**B. Utility Notification.** No solar photovoltaic installation shall be constructed until evidence has been given to the Site Plan Approval Authority that the utility company operating the electric grid the installation is to be connected to 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.

## OPTIONAL - Pollinator Friendly Certification

Municipalities may wish to consider a requirement for pollinator-friendly certification of CSPIs. This ensures the CSPI is planted and maintained as a native wildflower meadow, without requiring additional, continued oversight by the Site Plan Approval Authority. The Pollinator-Friendly Certification Program for Solar PV Arrays, administered by UMass Clean Energy Extension, is a program that promotes the planting of native vegetation under and around solar arrays, and maintenance of vegetation, fencing, nesting habitat, and other features to support continued use of land under and around solar arrays by native pollinators and other wildlife. The criteria for each level of certification are available on the UMass Clean Energy Extension website at (https://ag.umass.edu/clean-energy/services/pollinator-friendly-solar-pv-for-massachusetts). These criteria are updated periodically as new information and scientific research become available.

Example language:

**C. Pollinator-Friendly Certification.** No Commercial-Scale Solar Photovoltaic Installation shall be constructed until proof has been given to the Site Plan Approval Authority that the project proponent has obtained Pollinator-Friendly Certification for the solar photovoltaic installation through the UMass Clean Energy Extension Pollinator-Friendly Certification Program at a minimum of the [choose Certified, Silver, or Gold] Certification Level, or other equivalent certification as determined by the Site Plan Approval Authority. This certification must be maintained throughout the life of the installation.

## PROTECT THE WATER SUPPLY!

Municipalities should protect the water supply through requirements and standards that should be addressed during the site plan review process. Some of the suggestions to protect the water supply are covered elsewhere in this document through standards of development and decommissioning.

Additional considerations to protect the water supply in your zoning regulations:

- Require planting of low growing grasses or regular mowing of other types of grasses to ensure minimal fuel for wildfires in areas around panels.
- Ensure that there is no no oil, hazardous materials or other potential contaminants stored on-site
- Require only non-toxic materials to be used in transformers.

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# 9 SITE PLAN REVIEW STANDARDS

Many zoning bylaws already include general language regarding dimensional requirements (such as height or setbacks), as well as lighting and signage standards. The standards identified in this section of the guide may be used in addition to existing special use permit and site plan review standards, or they may be used to create a stand-alone set of review standards specific to solar photovoltaic installations. These standards are often included under sections identified as Local Site Requirements, Dimensional Regulations, or Site Plan Review Design and Operations Standards. Standards may be written so as to differ across projects based on size, type, or permitting pathway (as-of-right vs. special permit).

# SAMPLE BYLAW/ORDINANCE LANGUAGE

## COMPONENTS OF BYLAW/ORDINANCE TYPICALLY IN THE *SITE PLAN REVIEW STANDARDS* SECTION AND SAMPLE LANGUAGE

Municipalities may want to identify specific standards or criteria for the site plan approval of solar photovoltaic installations and its related application requirements. Suggestions below may or may not be appropriate for your community.

The following language addresses large-scale PV installations.

All commercial-scale solar photovoltaic installations requiring Site Plan Review shall adhere to the following Design and Operation Standards.

### Height

In general, height standards should be consistent with requirement for other types of structures. Separate height requirements may be imposed if there is a compelling reason to do so. For example:

**A. Height.** The height of any structure associated with a Commercial-Scale Ground Mounted Solar Photovoltaic Installation shall not exceed 35 feet.

### Building Height Standards

Standards within the zoning bylaw may need to be adjusted to include an exemption for the small increase in height created by roof-mounted solar PV installations. For example:

**B. Building Height Regulations Exemptions.** Mechanical equipment and appurtenances necessary to the operation or maintenance of the building or structure itself, including chimneys, ventilators, plumbing vent stacks, cooling towers, water tanks, broadcasting and television antennae and roof-mounted solar energy systems.

## Setbacks

Minimum setbacks can be established to meet standards already required by the individual municipality, based on their desire to preserve viewsheds and character, as outlined in planning documents (e.g. Master Plan, Open Space and Recreation Plan), or along any designated scenic roads within municipal limits. Some municipalities require buffering from adjacent residential properties that exist at the time of permitting, along with larger setbacks from the right-of-way or other zoning district.

In general, these setbacks should be consistent with other use types. For example:

> **C. Setbacks.** All Medium and Large Ground-Mounted Solar Photovoltaic Installations shall meet the front setback of 50 feet, side setbacks of 20 feet, and rear setback of 20 feet.

Smaller setbacks may be considered for small-scale, residential projects:

> Small Ground-Mounted Solar Photovoltaic Installations accessory to principal use may be located no closer than [1/2 of the setback that would otherwise apply] from the front, side or rear lot line. All ground-mounted solar energy systems in residential districts shall be installed either in the side yard or rear yard to the extent practicable.

Larger setbacks may be considered for Commercial Solar Photovoltaic Installations, if there is a compelling reason to do so. For example:

> For all Commercial-Scale Ground-Mounted Solar Photoelectric Installations, minimum setbacks shall be as follows:
> FRONT SETBACK (feet) 100
> REAR YARD (feet) 100
> SIDE YARD (feet) 100
> PERIMETER SETBACK (feet) 100

Acreage and generating capacity thresholds apply in the aggregate to new facilities and expansions of existing facilities. For expansions, the acreage and output generation of the existing facility would be added to those of the proposed expansion to determine the overall size and generating capacity. Required setback areas shall not be counted toward a facility's total acreage.

## Appurtenant Structures

In general, all appurtenant structures should be subject to the same requirements as other types of structures. This can be specifically called out within the bylaw or ordinance language.

**D. Appurtenant Structures**. All appurtenant structures to a solar photovoltaic installation shall be subject to the requirements of the Zoning Guide 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 screened from view by vegetation.

## Lighting

Dark Sky standards for lighting are often included and defined elsewhere in the zoning code, particularly as a consideration in Site Plan Review. The intent of the lighting/dark sky regulations is to manage and/or limit outdoor lighting in order to preserve and recover the visibility of the night sky; prevent light pollution, light trespass, and glare; to conserve energy and protect natural resources; and to facilitate safety and security of persons and property.

**E. Lighting**. Lighting shall be consistent with local, state and federal law. Lighting of all 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 energy system shall be directed downward and shall incorporate full cutoff fixtures to reduce light pollution. Lighting of CSPI shall be limited to night-time maintenance and inspections by authorized personnel, and shall comply with Dark Sky standards. There should be no illumination when personnel are not on the site.

## Signage

Sign standards are often defined elsewhere in the zoning code, and can be referenced here.

**F. Signage.** A sign shall be erected identifying the owner and providing a 24-hour emergency contact phone number of the CSPI owner or operator. CSPIs shall not display any advertising. Signs must comply with sign standards as identified in the community's sign regulations.

## Day-time Visual Distraction

If restrictions on visual distractions are not included elsewhere in the bylaw or ordinance, they may be defined here. For example:

**G. Day-time Visual Distraction.** The Commercial-Scale Ground-Mounted Photovoltaic Installation shall be positioned to minimize glare on any residence or public way, and shall not create a visual obstruction on a public roadway, such as blocking intersections or creating blind curves. The applicant should submit a ratings and technical specifications for the solar panels to ensure minimal reflectivity.

## Utility Connections

**H. Utility Connections**. All utility connections from the solar photovoltaic installation must be placed underground, unless it can be demonstrated to the Site Plan Approval Authority that soil conditions, shape, and topography of the site or requirements of the utility provider make it infeasible. Electrical transformers for utility interconnections may be above ground if required by the utility provider.

## Fencing

**I. Fencing.** There shall be a fence built surrounding the solar array and ancillary equipment. The fence shall be knuckled selvage chain link fence unless determined otherwise by the Site Plan Approval Authority. The fence shall be at least six inches above the ground to allow for wildlife crossing under fence.

***If Pollinator-Friendly Certification is required (see Section 7), that may be referenced in the bylaw language. For example:***

**I. Fencing.** There shall be a fence built surrounding the solar array and ancillary equipment. The fence shall be knuckled selvage chain link fence unless determined otherwise by the Site Plan Approval Authority. There shall be a gap along the bottom of the fence that complies with UMass Clean Energy Extension Pollinator-Friendly Certification Program standards, in order to allow for wildlife crossing under fence.

## Access Roads

**J. Access Roads**. Access roads shall be planned and constructed in consultation with the Department of Public Works in order to minimize grading, stormwater/run-off control, removal of stone walls or trees and to minimize impacts to environmental, wetlands, or historic resources.

Emergency Access

**K. Emergency Access.** The CSPI owner or operator shall provide a copy of the project summary, electrical schematic, and an approved site plan, to the local fire department and the Building Inspector. Upon request the owner or operator shall cooperate with local emergency services in developing an emergency response plan, which may include ensuring that emergency personnel have immediate, 24-hour access to the facility. All means of shutting down the CSPI shall be clearly marked. The owner or operator shall identify a responsible person for public inquiries throughout the life of the installation and shall provide a mailing address and 24-hour telephone number for such person(s). **These components shall be included in the Operation & Maintenance Plan.**

# OTHER CONSIDERATIONS

## ENERGY STORAGE

As battery technology improves, energy storage has recently made its way into solar PV site plans as an additional component of larger CSPIs. As of April 2020, energy storage will now be required for new solar projects larger than 500 kW seeking incentives under the SMART program. Because this is a relatively new technology, there are not yet clear standards and criteria for development of these systems. The DOER Model Solar Bylaw does not address them.

Current energy storage systems are most often composed of large banks of lithium ion batteries, although new technologies are being developed and beginning to enter the market. Energy storage systems are beneficial to the electricity grid, because they allow for a more regulated flow of electricity into the grid, and also allow intermittent renewable energy sources to provide electricity during times when it is not being directly generated, for example, allowing for the use of solar-generated electricity at night. Of course, energy storage systems add additional complexity to a proposed solar PV project, and additional considerations with regards to safety, environmental hazards, noise, aesthetics, operations and maintenance, and decommissioning must be addressed.

Local boards and planning departments are beginning to gain experience in reviewing battery storage systems, and examining the extent to which they fit into existing local zoning regulations. Unfortunately, because they are a relatively new technology, there are not yet clear standards and criteria for development of these

systems. This gap has been recognized at both the state and federal level. The U.S. Department of Energy (DOE) has established an Energy Storage Safety Collaborative, which is currently working on updates to the various safety codes, regulations, and standards (collectively known as CSR) applicable to energy storage systems. The Massachusetts Clean Energy Center reports it is supporting the development and implementation of appropriate CSRs, as well exploring outreach and education opportunities for emergency personnel and other relevant authorities. Because energy storage systems are evolving quickly, the guidance provided below is relatively general and preliminary. We encourage you to check the resources identified at the end of this guide for any updates on the regulation of energy storage systems.

## Safety

Energy storage systems are regulated by a variety of safety codes, standards, and regulations – the "CSRs" noted above. The US DOE has identified over 40 codes and standards that may require updates to address energy storage systems - including building codes, electrical codes, and fire safety codes – but not all of these codes require enforcement by local officials.

Safety codes in a given municipality are enforced by Authorities Having Jurisdiction (AHJs), which is a collective term for the organizations, agencies, or individuals responsible for enforcing the requirements of a specific code or standard. The AHJ in a given community may vary, depending on the municipality and the code being enforced. According to the Massachusetts Department of Fire Services, *the phrase "authority having jurisdiction," or its acronym AHJ, is used in … a broad manner, since jurisdictions and approval agencies vary, as do their responsibilities. Where public safety is primary, the AHJ may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority*.

Your municipal fire chief, building inspector, and electrical inspector should be able to identify areas in which they qualify as an AHJ, and which safety codes they are responsible for enforcing. When an energy storage project comes forward, it is important to ensure these officials are staying abreast of any new additions to national safety codes applicable to energy storage systems, and any modifications of these rules specific to Massachusetts. For example, the National Fire Prevention Association (NFPA) issued an updated *NFPA 1 Fire Code* in 2018, which addresses energy storage systems specifically. The State Fire Marshall announced Massachusetts amendments to that code in October 2019, including provisions relevant to energy storage systems.

In the absence of additional guidance regarding safety planning, the Safety Subgroup of the national Energy Storage Integration Council has the following recommendations regarding incident preparedness and training of emergency response personnel. These recommendations can inform the portion of the Operations and Maintenance Plan composed by the facility developer in consultation with emergency response personnel.

*For those personnel called on during emergency situations an important consideration is appropriate training to recognize and respond to all reasonably foreseeable incidents that may occur at the site of an energy storage installation, whether the incident source is the system itself or something external (e.g. wildfire or flood). It is recommended that … the energy storage supplier make available all necessary emergency action information related to their system. This information could also be included in the operations and maintenance manual. This emergency action information will contain salient information for preparing for incidents and could be used by the utility and other stakeholders, such as local responders, to prepare a site specific, emergency action plan.*

*The action plan could address possible incident scenarios starting during construction and commissioning and continuing through operation and decommissioning. This could include a call/email list for all those who need to be informed of a situation potentially including: emergency personnel, operators, owners, regulators, and many others. Actions for these parties may include urgent responses, such as responding to a medical emergency, or non-urgent responses, such as performing an incident investigation. This plan could account for all reasonable accidents that could occur at the project site possibly including but not limited to medical emergencies and incidents associated with fires, chemical spills, explosions, shocks and mishandling of the system or materials related to the installation.*

*The incident training manual could allow utility personnel and their contractors, as well as first and second responders, to understand the likely incident scenarios associated with the energy storage installation and appropriate actions to take to for each scenario. It could include, at a minimum, emergency shutdown procedures, a Materials Safety Data Sheet (MSDS) or Safety Data Sheet (SDS) along with any first-aid requirements. Steps and actions listed in the incident training manual could be consistent with the Occupational Safety and Health Administration (OSHA) hazard communications standard (HCS).*

Several technical recommendations regarding design for safety are included in *Appendix D*.

Responding to emergencies at a solar facility may require special training and equipment. Lithium ion battery fires, for example, cannot be treated like common fires; they have different burn characteristics and toxic byproducts. The relevant permitting authority for a commercial-scale solar PV facility – be it the Site Plan Review Authority in As-of-Right zones, or the Special Permit Approval Authority – should be prepared to include conditions on the permit necessary to ensure that emergency personnel have access to the appropriate training and equipment in order to respond to any emergencies that may occur on-site. It is not inappropriate for the municipality to request or require that the solar developer cover the costs of necessary training or equipment. NFPA currently has an on-line training available for fire personnel (see Resources).

In many cases, both the solar PV facility owner and local emergency personnel may prefer that specialized emergency response personnel employed by the facility owner respond to directly address certain kinds of incidents specific to solar sites, including electrical and chemical fires. Local emergency personnel may not have the expertise or equipment necessary to respond appropriately to these situations, nor a comfort level working in close proximity to high voltages. Where this is the case, emergency personnel's main role may be to contain any fires to the facility property, while ensuring that appropriate personnel employed by the facility are alerted and responding to the scene. Solar PV arrays and energy storage systems typically include remote monitoring systems which alert the facility owner to any problems or unusual conditions occurring on-site. However, ensuring that emergency contact information for the facility is readily accessible and up-to-date is imperative, especially since solar PV facilities often change hands multiple times over their operational life.

## Environmental Considerations

Large battery systems are an evolving technology, but many batteries contain heavy metals, which could cause damage if leached into the environment. In addition, fire suppression systems may include release of a chemical agent to suppress the fire. Material Safety Data Sheets (MSDS) for fire suppression chemicals should be reviewed carefully, and the potential for any leaking, leaching, or chemical spills reviewed with the solar developer. The Site Plan Review Authority, and Conservation Commission where applicable, should take special care in reviewing plans for energy storage systems placed in environmentally-sensitive areas.

## Environmental Considerations

Because batteries require climate-controlled conditions, these systems must be actively heated and cooled over the course of the year, to prevent freezing or

overheating. The fans associated with these units do produce noise, which in some conditions may be audible to nearby abutters. It is important to ensure that these systems meet any noise regulations or bylaws applicable in the municipality.

In addition to this long-term noise consideration, there are also noise issues to consider during construction. Depending on the order of workflow at the site, energy storage systems may be installed at the site before the solar PV facility is in full operation. These energy systems may sit idle for multiple weeks before the utility finishes its approval process and the facility goes into operation. During this time, battery systems need to be kept from freezing or overheating; in the absence of an operational solar array, the solar developer may expect to power climate control systems through a diesel generator, which can disturb abutters. Don't forget to ask the solar developer about the timing of installation of the energy storage system, and their plans for keeping the batteries climate-controlled until the system is fully operational.

## Aesthetics

Batteries for energy storage are often packaged into large metal shipping containers, installed over a concrete pad. These units are not always the most attractive, and some permitting authorities have requested that these units be painted such that they blend in with the surrounding scenery. However, these systems may need to be painted white or another light color, to reduce heat load on the unit. Vegetation screens, situated at a safe distance from the unit, may provide an alternative method to screen these systems from view, as well as offer cooling value. One innovative approach in more developed areas could be to have a mural painted on the side of the unit.

## Operations and Maintenance

The municipality may wish to include requirements to ensure the energy storage component of the Operations and Maintenance Plan is complete. According to the Energy Storage Integration Committee Safety Subgroup, the plan the solar developer provides to the utility could be designed to include:

- Plans for inspecting, servicing, repair and renovation as well as any addition to the system (e.g. installation of additional storage capacity).
- A complete operation and maintenance manual. This manual could provide instructions for all required operating and maintenance activities, the timing for these activities, and who will perform them. Ideally the manual could be in electronic form and automatically prompt utility personnel and/or their agents

to initiate, perform, and document required actions after the system is commissioned and placed in operation. This manual could also include conditions under which the system will have met end of warranty, service life, and operational life.

A municipality may choose to require all or a subset of these components.

## Decommissioning

Decommissioning costs and protocol for the energy storage system should also be considered. The Energy Storage Integration Committee Safety Subgroup provides the following guidance regarding decommissioning, which may be already addressed by the utility, but is worth noting here: *It is recommended that the energy storage supplier be required to develop a decommissioning and disposal plan for utility approval. This plan could explain the procedure for decommissioning, including any hazards this may present, as well as the steps to disconnect the system from external automated control systems. It could elaborate who is responsible for disposal and recycling, what costs this will incur, how articles could be packaged for disposal, and who is responsible for shipping the materials to the disposal or recycling site.*

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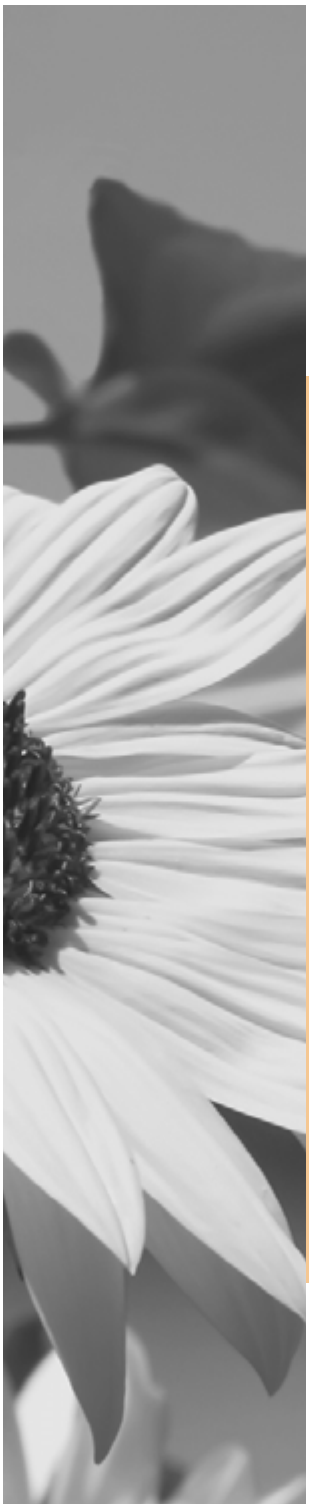
# 10 ENVIRONMENTAL STANDARDS



Municipal planners and Site Plan Approval Authorities (whether Planning Boards or Zoning Board of Appeals members) should carefully consider impacts of proposed projects on abutters and neighbors, safety concerns, and short- and long-term environmental impacts.

> While solar energy is a renewable, green resource, its generation is not without environmental impacts. Though solar facilities do not generate the air or water pollution typical of other large-scale fossil-fuel power production facilities, impacts on wildlife habitat and stormwater management can be significant due to the large scale of these uses and the resulting extent of land disturbance. The location of sites, the arrangement of panels within the site, and the ongoing management of the site are important in the mitigation of such impacts.
>
> **- Darren K. Coffey, AICP**
> American Planning Association Planning Advisory Service, 2019

# SAMPLE BYLAW/ORDINANCE LANGUAGE

## ENVIRONMENTAL COMPONENTS OF BYLAW/ORDINANCE TYPICALLY IN THE *SITE PLAN REVIEW STANDARDS* SECTION AND SAMPLE LANGUAGE

Municipalities may choose to adopt specific environmental standards as part of Site Plan Review Design and Operation Standards, along with the basic standards addressed in *Section 9*. The examples provided below may be adapted for your community.

### Vegetation Clearing

**A. Vegetation Clearing**. Clearing of natural vegetation shall be limited to what is necessary for the construction, operation, and maintenance of the Commercial Solar Photovoltaic Installation or otherwise prescribed by applicable laws, regulations, and guides. Existing root structures and topsoil shall be maintained to the maximum extent possible. Where removal of naturally occurring vegetation such as trees and shrubs is planned, the owner of the CSPI must demonstrate that the removal of this vegetation is necessary and its presence adversely affects the performance and operation of the solar installation.

### Project Visibility

**B. Project Visibility.** The CSPI shall be designed to minimize its visibility, including preserving natural vegetation to the maximum extent possible, blending in equipment with the surroundings, adding vegetative buffers to provide an effective visual barrier from adjacent roads and driveways, and from abutting dwellings.

*Topsoil is critical to supporting healthy vegetation and reducing stormwater flows post construction. Topsoil, the uppermost soil layer, also known as "A horizon," is typically higher in organic matter and darker in color than underlying soils. It also often has a granular and more porous structure and has lower clay content. Permanent removal of topsoil often ends in poor vegetation growth and survival and greatly diminished capacity for soaking up and mitigating stormflows.*

*See page 48 for some suggestions on how to ensure preservation and management of topsoil.*

## Site Vegetation Planting and Vegetation Maintenance

As noted in Section 7, municipalities may wish to consider a requirement for pollinator-friendly certification of CSPIs. This ensures the CSPI is planted and maintained as a native wildflower meadow, without requiring additional, continued oversight by the Site Plan Approval Authority. The Pollinator-Friendly Certification Program for Solar PV Arrays, administered by UMass Clean Energy Extension, is a program which promotes the planting of native vegetation under and around solar arrays, and maintenance of vegetation, fencing, nesting habitat, and other features to support continued use of land under and around solar arrays by native pollinators and other wildlife.

For municipalities that wish to include this requirement, the following language can be used:

**C*. Vegetation Planting and Maintenance.** The project proponent must obtain Pollinator-Friendly Certification for the solar photovoltaic installation through the UMass Clean Energy Extension Pollinator-Friendly Certification Program at a minimum of the [choose Certified, Silver, or Gold] Certification Level, or other equivalent certification as determined by the Site Plan Approval Authority. This certification must be actively maintained throughout the lifetime of the installation. **A copy of the final Establishment and Maintenance plan approved by the UMass Clean Energy Extension Pollinator-Friendly Certification Program must be included in the final Operations & Maintenance Plan for the installation.**

**Alternatively, or in addition,** municipalities can choose to include the following language regarding vegetation plantings.

**C. Vegetation Planting**. A diversity of plant species native to New England shall be used for any visual screens and vegetative erosion controls. Use of invasive plants, as identified by the most recent version of the "Massachusetts Prohibited Plant List" maintained by the Massachusetts Department of Agricultural Resources, is prohibited. If deemed necessary by the Site Plan Approval Authority, the depth of the vegetative screen shall be 30 feet and will be composed of native trees and shrubs staggered for height and density that shall be properly maintained.

The following language may also be used to regulate vegetation management on-site.

**D. Vegetation Management.** The open area of the site shall be seeded with a pollinator mix and maintained as bird and insect habitat. Mowing may only be done to retain a natural functioning of the landscape. Plants shall be maintained and replaced as necessary by the owner of the CSPI for the life of the CSPI. **The plan for vegetation control, and if applicable, animal control, shall be included in the Operation & Maintenance Plan.**

**E. Animal and Plant Management**. Herbicides, rodenticides, or any other pesticides may not be used to control vegetation or animals at a CSPI, except where herbicide use has been approved by the Site Plan Approval Authority for control of invasive species. In a dual-use CSPI, the agricultural operator, but not the CSPI operator, is exempt from this restriction. **The plan for vegetation control, and if applicable, animal control, shall be included in the Operation & Maintenance Plan.**

## STORMWATER MANAGEMENT, EROSION & SEDIMENT CONTROL

Site disturbance for large solar facilities can be significant due to the large area taken up by the solar PV panels themselves, as well as inter-row spacing, trim zones to limit shading of panels, and associated electrical infrastructure. Depending on the site orientation and the panels to be used, significant grading may be required for panel placement, roads, and other support infrastructure.

Solar PV installations that impact areas identified in Chapter 131, Section 40 are subject to the state Wetlands Protection Act 310 CMR, and the requirements within the Massachusetts Stormwater Handbook and Standards. Local wetlands and stormwater regulations may also apply to the installation.

The project proponent will need to submit a Stormwater Management Plan, detailing how the site will meet state and local regulations. Depending on the project siting relative to wetlands and other water bodies, the Stormwater Management Plan may need to be reviewed solely by the Site Plan Approval Authority, or by both the Authority and the Conservation Commission.

The Massachusetts Stormwater Handbook and Stormwater Standards can be found at: https://www.mass.gov/guides/massachusetts-stormwater-handbook-and-stormwater-standards

Considerations for phasing the construction could minimize sedimentation.

A municipality may have stormwater management and erosion and sediment control standards and requirements in a number of possible places within local municipal code.

- A community regulated by EPA's MS4 permit (Municipal Separate Storm Sewer System) will likely have these standards specifically in a general bylaw or ordinance and possibly accompanying regulations. Any part of the zoning relative to drainage and solar photovoltaic installations ought to reference specifically that stormwater management and erosion and sediment control part of the local municipal code.
- Non-MS4 permit communities may have drainage and erosion and sediment control standards in subdivision regulations and in the zoning bylaw. Given the scale of CSPI projects, all such development proposals should include provisions for erosion and sediment control and stormwater management. This is critical to avoiding impacts to properties and resources that are located downgradient from the solar field. Substandard development projects have the effect of often passing on costs to others. If no such section exists in the zoning bylaw, following is some example language:

**F. Stormwater Management.** A Stormwater Management Plan must be submitted with the stamp and signature of a Registered Professional Engineer (PE) who is licensed in the Commonwealth of Massachusetts. The Stormwater Management Plan shall fully describe the project in drawings, narrative, and calculations. It shall include:

a. The site's existing and proposed topography;
b. All areas of the site designated as open space;
c. A description and delineation of existing stormwater conveyances, impoundments, environmental resources on or adjacent to the site into which stormwater flows;
d. A delineation of 100-year flood plains, if applicable;
e. Estimated seasonal high groundwater elevation in areas to be used for stormwater retention, detention, or infiltration;
f. Existing and proposed vegetation and ground surfaces with runoff coefficients for each;
g. A drainage area map showing pre- and post-construction watershed boundaries, drainage area and stormwater flow paths, including municipal drainage system flows, at a scale that enables verification of supporting calculations;
h. A recharge analysis that calculates pre- and post-construction annual groundwater recharge rates on the parcel;
i. A description and drawings of all components of the proposed stormwater management system;
j. Soils information from test pits performed at the location of proposed Stormwater Management facilities, including soil descriptions, depth to seasonal high groundwater and depth to bedrock. Soils information will be based on site test pits logged by a Massachusetts Certified Soil Evaluator.

## Preserve and Manage Topsoil and Soil Porosity

If there are not explicit and strong provisions for preservation of topsoil in the local Earth Removal bylaw/ordinance, it is important to consider adding requirements for project proposals to fully describe control measures that will be used to preserve the existing topsoil on the construction site.

At a minimum, site owners and operators must preserve existing topsoil on the construction site to the maximum extent feasible. For low-density developments, the common measure of topsoil stripping might be unnecessary and should be minimized, if not avoided. If it is determined that preserving native topsoil is infeasible, the reasons why this was determined must be addressed in the project proposal.

Further, proper management of the topsoil stockpile should include measures that minimize or eliminate the discharge of material from entering drainage systems or surface waters. For any stockpile or land clearing debris composed, in whole or in part, of sediment or soil, the following requirements apply:

- Locate the piles within the designated limits of disturbance.
- Protect from contact with stormwater (including run-on) using a temporary perimeter sediment barrier.
- Where practicable, provide cover or appropriate temporary vegetative or structural stabilization to avoid direct contact with precipitation or to minimize sediment discharge.
- Never hose down or sweep soil or sediment accumulated on pavement or other impervious surfaces into any stormwater conveyance, storm drain inlet, or surface water.
- To the maximum extent practicable, contain and securely protect from wind.
- For final stabilization, all areas within the limits of disturbance to be seeded or planted must be de-compacted and topsoiled, and then seeded or planted with perennial vegetative cover.
- Immediately after seeding or planting the area to be stabilized, select, design, and install non-vegetative erosion controls that provide cover (e.g., mulch, rolled erosion control products), to the extent necessary to prevent erosion while vegetation is becoming established.

Where construction activity does require grading and filling and where compaction of soil can be expected, this disturbance should be limited. Soil treatments/amendments should be considered for such disturbed areas to restore permeability. If the bulk density is not reduced following fill, these areas will be considered semi-impervious after development and runoff volumes should be calculated accordingly.

# MITIGATION CONSIDERATIONS

## MITIGATION COMPONENTS OF BYLAWS/ORDINANCES AND SAMPLE LANGUAGE

Tree clearing is a major concern when it comes to solar development. Solar developers require clearing of wooded areas within and surrounding the solar array to avoid shading of solar panels by surrounding vegetation. Meanwhile, local community residents and abutters may be concerned about the loss of forest, and associated habitat and ecosystem services. Communities can reduce potential conflicts between solar development and forest preservation by requiring mitigation for large-scale forest clearing.

### Mitigation for Loss of Wildlife Habitat within the Installation

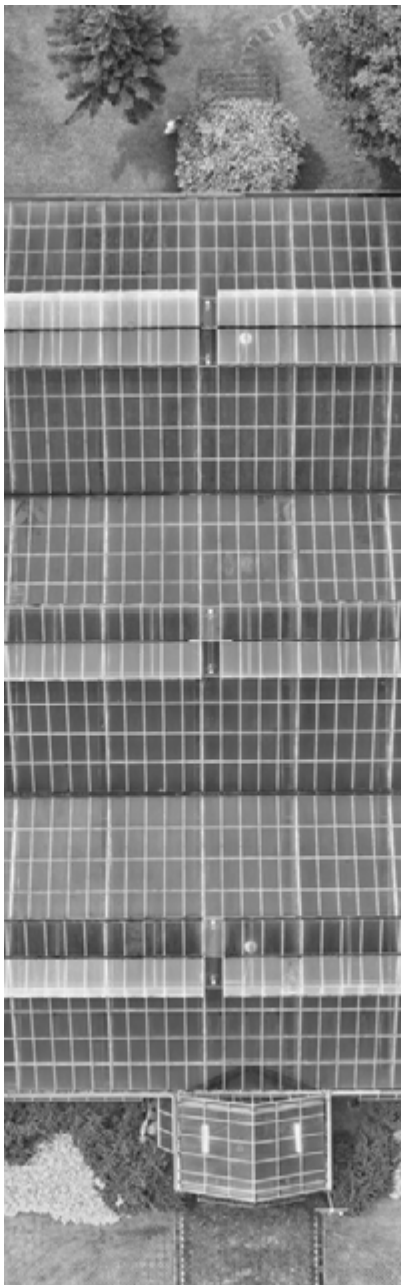
If natural forest, shrubland, or grassland is proposed to be converted to a CSPI, the municipality may require that the project proponent create a wildflower meadow habitat within and immediately around the CSPI, and a successional forest habitat in the surrounding areas managed to prevent shading until the installation is decommissioned and the site restored to forest. This can be accomplished through Pollinator-Friendly Certification, which requires establishment and maintenance of a native wildflower meadow. Alternatively, the Site Plan Approval Authority can provide direct oversight of the establishment and maintenance of such habitat. The special permit may be conditioned to effect and make enforceable this requirement. Keep in mind that replacement of a natural habitat with a managed wildflower meadow is likely to provide higher quality habitat than gravel or non-native turfgrass; however, such a substitution is unlikely to replace the wildlife habitat and other ecosystem services provided by the natural habitat.

**G. Mitigation for Loss of Wildlife Habitat within the Installation.** If undeveloped land is proposed to be converted to a CSPI, the plans shall show mitigation measures that create a wildflower meadow habitat within and immediately around the CSPI and a successional forest habitat in the surrounding areas managed to prevent shading until the installation is decommissioned and the site restored to forest.

The special permit may be conditioned to effect and make enforceable this requirement.

## Mitigation for Loss of Carbon Sequestration and Forest Habitat

If forestland is proposed to be converted to a CSPI, the municipality may require that the developer designate an area of unprotected forestland (that is, land that could otherwise be developed under current zoning) within the municipality for permanent protection. The location of the designated forest may be limited to the parcel under development or contiguous parcels, or allowable anywhere within the municipality. The designated area may be required to be equal in size to the project footprint of the proposed for development, or of a size equal to multiple times the total area of such forest conversion (e.g two or four times). Such designated land shall remain in substantially its natural condition without alteration except for routine forestry practices until such time as the CSPI is decommissioned and the CSPI project footprint is restored to forest. The special permit may be conditioned to effect and make enforceable this requirement.



**H. Mitigation for Loss of Carbon Sequestration and Forest Habitat.** If undeveloped land is proposed to be converted to a CSPI, the plans shall designate an area of unprotected land (that is, land that could otherwise be developed under current zoning) contiguous parcels or nearby, or location within the municipality agreed upon by the the Site Plan Authority in consultation with the Conservation Commission, under common ownership that comprise the project site, and of a size equal to four times the total area of such forest conversion. Such designated land shall remain in substantially its natural condition without alteration except for routine forestry practices until such time as the CSPI is decommissioned and the site restored to forest. The special permit may be conditioned to effect and make enforceable this requirement.

*As an alternative to forest protection, municipalities can also consider a tree replacement bylaw or ordinance for solar development that clears large acreages of trees. This can be applied to all types of development that are regulated by the zoning code. See Appendix E for example.*

# 11 CONSTRUCTION, MAINTENANCE, MONITORING & MODIFICATIONS

The intent of this section is to provide assurance that the facility will be built and operated in accordance with the approved agreement and maintained within accepted standards for its lifespan of operation. This section covers **Construction**, **Maintenance**, **Annual Reporting** and **Modification** requirements. By signing an agreement with the municipality, the operator is assuming responsibility and assuring the municipality it will meet all of its short and long term obligations under the signed agreement.

# SAMPLE BYLAW/ORDINANCE LANGUAGE

## COMPONENTS OF BYLAW/ORDINANCE TYPICALLY IN THE *CONSTRUCTION, MAINTENANCE, MONITORING & MODIFICATIONS* SECTION AND SAMPLE LANGUAGE

Municipalities may want to identify specific standards or criteria for the approval of solar photovoltaic installations and its related application requirements. Suggestions below may or may not be appropriate for your community.

### Construction Monitoring

It is important that municipal boards are assured that the operator is constructing the solar array in accordance with the approved plan. Once the plan has been approved, the appropriate municipal board(s) or municipal staff will need to monitor construction to assure it is being done to in accordance with the approved plan, as overseen by the Building Inspector, the Site Plan Approval Authority, the Special Permit Granting Authority, and/or the Conservation Commission. The construction monitoring costs may be required to be covered by the developer as one of the conditions in the approved agreement. Alternatively, approval may be conditioned upon having an engineer provide weekly reports to the supervising authority, indicating the work completed and stamping it as being in substantial compliance with the approved plans.

**A. Construction Monitoring**. The Site Plan Approval Authority may require a third-party inspector, selected by and acting under the direction of the Building Commissioner, to be employed to monitor compliance with all approvals and conditions during the CSPI's construction at the applicant's expense.

### Maintenance

It is important for safety, visual appearance, and environmental compliance that the operator perform agreed upon regular maintenance of the facility. If there is the need for additional maintenance need, the operator must address it in accordance with the conditions agreed to in the permit, and in accordance with state law and the municipal bylaw or ordinance.

**B. Maintenance.** The CSPI 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 emergency services. The owner or operator shall be responsible for the cost of maintaining the solar photovoltaic installation and all access roads that are not public ways.

## Annual Reporting

The community should be kept up-to-date through the identified proper municipal authorities informed and in accordance with the signed agreement. The operator must complete and submit any required annual reports to appropriate Town or City authorities. These authorities can be established via the bylaw or ordinance or as a condition of approval. Appropriate authorities may include the Health Agent, Town/City Clerk, Fire Chief, Police Chief, Planning Department (and/or Planning Board or ZBA), Highway Superintendent or DPW Director, Town/City Engineer, Conservation Commission, or others.

**C. Annual Reporting**. The owner or operator of a CSPI shall submit an annual report demonstrating and certifying compliance with the Operation and Maintenance Plan, the requirements of this guide, and approvals granted hereunder, including but not limited to continued management and maintenance of vegetation, compliance with the approved plans and any permit conditions, continuation of liability insurance, and adequacy of road access. The annual report shall also provide information on the maintenance completed during the course of the year and the amount of electricity generated by the facility. The report shall be submitted to the Board of Selectmen or Town/City Council, Planning Board, Fire Chief, Building Commissioner, Board of Health, and Conservation Commission (if a wetlands permit was issued) no later than 45 days after the end of the calendar year.

***If the municipality has required Pollinator Friendly Certification of the CSPI through the UMass Clean Energy Extension program, it may request a copy of the Annual Maintenance Log, which is submitted annually to UMass.***

E. The owner or operator of a CSPI shall submit a copy of the Annual Maintenance Log submitted to UMass Clean Energy Extension as proof of continued participation in the Pollinator Friendly Certification Program. The log shall be submitted to the [list appropriate authorities] no later than 45 days after the end of the calendar year.

## Modifications

There are two types of modifications municipal authorities commonly face. The first is a modification during construction based on the existing site conditions, forcing the developer to alter the installation and configuration of the site. The second are modifications put in place by the developer after site plan approval (additional panels, etc). The operator must inform the Site Plan Review Authority of any type of proposed modification to allow for proper review and approval.

**D. Modifications.** All modifications to a CSPI made after issuance of the required building permit shall require approval by the Site Plan Approval Authority before implementation.

## Transfer of Ownership

In the current solar market, commercial-scale facilities change ownership frequently – in many cases, even before the project is fully constructed and operational. It is important to include language within the conditions set on a permit approval that detail the expectations associated with a transfer of ownership.

**E. Transfer of Ownership.** In the event that the solar facility is sold, all municipal permits, conditions, and associated documentation shall be provided in both digital and hard copy format to the new owner, including [add specific documents as needed]. The [Site Review Approval Authority/Special Permit Granting Authority] must be provided with updated contact information for the new owner, including name, address, telephone number, and e-mail address. Authorities Having Jurisdiction, including local emergency personnel, must be provided with updated emergency contact information, including an emergency contact number that is staffed 24 hours a day. The new owner must abide by all conditions as detailed in the final permit. Any proposed changes to the project shall require approval as described in the Modifications section of the municipality's solar zoning bylaw [list section of bylaw].

# 12 DISCONTINUANCE & REMOVAL

The intent of this section is to provide guidance on the discontinuation and removal of the Commercial Solar Photovoltaic Installations. All actions and requests in this section should be at the expense of the owner or operator, upon written request of the Building Inspector Select Board, Town or City Council. If in accordance with the existing agreement there is an indication of lack of operation, maintenance or the discontinuance of the operation of the array, the municipality must take enforceable action. The terms of the agreement must also be transferrable and transmissible to any assigned future owners of the array. The removal of the CSPI should include returning to the original conditions in accordance with the approved building permit and any other permits or conditions. The challenge with solar PV installations is that they will likely be in place for at least 20 years; agreements, permits, and conditions must therefore be accessible to future local officials, as well as future owners of the solar PV installation, should the project change hands. Therefore, all language and requirements must be in clear and enforceable terms.

# SAMPLE BYLAW/ORDINANCE LANGUAGE

## COMPONENTS OF BYLAW/ORDINANCE TYPICALLY IN THE *DISCONTINUANCE AND REMOVAL* SECTION AND SAMPLE LANGUAGE

Municipalities may want to identify specific standards or criteria for approval of solar photovoltaic installations and its related application requirements. Suggestions below may or may not be appropriate for your community.

**A. Removal Requirements.** Any CSPI, or any substantial part thereof, not used for a period of one continuous year or more without written permission from the Site Plan Approval Authority, or that has reached the end of its useful life, shall be considered discontinued and shall be removed. Upon written request from the Building Inspector, addressed to the contact address provided and maintained by the owner or operator as required above, the owner or operator shall provide evidence to the Building Inspector demonstrating continued use of the CSPI. Failure to provide such evidence within thirty days of such written request shall be conclusive evidence that the installation has been discontinued. Anyone intending to decommission and/or remove such an installation shall notify the Site Plan Approval Authority and Building Inspector by certified mail of the proposed date of discontinued operations and plans for removal.

1. Physical removal of all parts of and appurtenances to the CSPI, including structures, equipment, security barriers and transmission lines;

2. Disposal of all solid and hazardous waste in accordance with local, state, and federal waste disposal regulations;

3. Stabilization or re-vegetation of the site as necessary to minimize erosion. The Site Plan Approval Authority may allow the owner or operator to leave landscaping or designated below-grade foundations in order to minimize erosion and disruption to vegetation.

4. Any site that was deforested for the CSPI, per Section 5(B) or (C), shall be restored to encourage native tree growth, including the planting of seedlings, if necessary, to establish growth. The cost of plant replacement shall be incorporated into the financial surety stipulated in Section 13.

**B. Right to Remove.** If the owner or operator of the CSPI fails to remove the installation in accordance with the requirements of this section, the town 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 facility is located. The Town/City may use the financial surety as stipulated in §13(D), below for this purpose.

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# 13 FINANCIAL SURETY

The intent of financial surety is to protect the municipality by making make sure that the funds identified for decommissioning and site stabilization are available throughout the lifetime of the project. In this section, we provide sample language to ensure a clear disposition of cash bonds or other financial surety, and annual confirmation of the existence of the financial surety for the lifetime of the project.

## SAMPLE BYLAW/ ORDINANCE LANGUAGE

### COMPONENTS OF BYLAW/ORDINANCE TYPICALLY IN THE *FINANCIAL SURETY* SECTION AND SAMPLE LANGUAGE

**A. Financial Surety.** Prior to commencing operation, the applicant shall provide a form of financial surety, through a cash deposit, in an amount determined to be adequate by the Site Plan Review Authority to cover cost of CSPI removal and site restoration.

**B. Decomissioning Cost Estimation**. The applicant shall submit a fully inclusive estimate of the costs associated with removal, prepared by a qualified engineer. The amount shall include an escalator for calculating increased removal costs due to inflation. Salvage for solar panels may be included for other components of the installation at the discretion of the Site Plan Review Authority.

See *Appendix E* for an example of estimating decommissioning costs.

**C.** The financial surety shall be maintained by the developer for the lifespan of the facility, with annual certification notices from the surety company or bank for surety bonds submitted to the Site Plan Review Authority. Such surety is not required for municipal facilities.

**D.** A cash deposit [of a minimum amount of $100,000 per MW (DC) of installed system capacity] shall be held by the Town Treasurer pursuant to M.G.L. Chapter 44, Section 53 ½.

## SOME ADDITIONAL CONSIDERATIONS ON THE TRANSACTION OF FINANCIAL SURETY

1. Cash deposit amount shall be identified in the conditions of the Special Permit

2. Interest earned on cash deposit shall be deposited into the General Fund and shall be returned to the developer with cash deposit at time of decommissioning.

3. Performance required and standards for determining satisfactory completion or default: by-law, ordinance, rule, regulation or contract stating that Building Inspector/Zoning Enforcement Officer shall inspect the project and provide written documentation of completion or default to the applicant and the Town.

4. The procedures the applicant must follow to obtain a return of the monies or other security: by-law, ordinance, rule, regulation or contract stating the applicant shall request in writing to the Building Inspector/Zoning Enforcement Officer (BI/ZEO) who shall in turn inspect the project for full completion (regarding a construction bond) or full decommissioning at the time it is requested. BI/ZEO shall inspect and provide in writing to the applicant and the Town of the condition of the project and inform the Town/City Treasurer and/or Accountant to release the funds to the applicant or to be used to restore the site to its original condition.

5. The project shall be deemed in default if it has been abandoned (as previously described in this bylaw), if applicant has notified the Town of default, or if the project is inactive for 180 days and deemed in default after inspection by the BI/ZEO and notice of default is sent to the Town/City, Treasurer and/or Accountant in writing.

# 14 PAYMENT IN LIEU OF TAXES (PILOT) LOCAL TAX PAYMENTS

We strongly recommend that towns and cities utilize Payments in Lieu of Taxes (PILOTs), rather than traditional property taxes in assessing Commercial-Scale Solar Photovoltaic Installations. PILOT agreements are made between the project proponent and the municipality to modify the schedule for the payment of taxes; these agreements ideally result in better cash management for the operator and a greater total tax receipt for the municipality. PILOTs also avoid questions of legality surrounding municipal property tax payments on certain types of solar photovoltaic installations.

PILOT Agreements must be ratified by Town Meeting or Town/City Council, and submitted to the Department of Revenue for approval. (For more information, contact the Massachusetts Department of Revenue). The municipality will account for PILOT payment revenue under the "New Growth" section of its total tax levy.

## The Legal Status of PILOTs

**PILOT Tax payments**. Under Massachusetts G.L. c. 59, §38H(b): “agreement for payment in lieu of taxes” (PILOT), municipalities are permitted to negotiate a fair value PILOT applicable to the developer and/or successor entities, which will be in place for the agreed upon lifespan of the proposed solar array.

## Negotiating a PILOT Agreement

PILOT agreements should be negotiated between the project proponent and the municipality in an open, equitable fashion. PILOT agreements should be negotiated with the assistance and involvement of the assessors. Before negotiating a PILOT, the eligibility of the project for a PILOT should be reviewed by Town Counsel or the City Solicitor.

## Exemptions to Property Taxes for Solar PV Arrays

Your community should be aware that in accordance with MGL Chapter 59 Section 5 (Clause 45), this MGL has negatively impacted the property taxes collected in other communities and provides for a tax exemption for solar and wind energy systems. It applies only to projects which are being utilized as primary or auxilliary source (i.e., if the energy is used on the site may be considered tax exempt).

# 15 THE PERMITTING PROCESS

## TIPS TO REMEMBER

### SITE PLAN REVIEW AUTHORITY/SPECIAL PERMIT GRANTING AUTHORITY

- **Follow Open Meeting Laws and Required Timelines** – This is ALWAYS legally required, but because development of CPSIs may be controversial, with a good deal of money wrapped up in their development, it is especially important to 'dot every i and cross every t' to avoid possible litigation.
- **As-of-Right vs. Special Permit Site Plan Review** – Recognize the difference between as-of-right non-discretionary site plan review, and special permit discretionary site plan review, and act accordingly.
- **Consult with other relevant municipal boards and departments**.
- **Third Party Consultation** – Third-party review of stormwater management plans is allowable under Massachusetts law, and should be paid for by the project proponent.
- **Negotiate PILOT payments in consultation with assessors and other relevant municipal representatives**.
- **Bonds for Decommissioning**
- **Consider site-specific aesthetic, environmental, and safety specifications, to be included in conditions set on the permit**.
- **Remember large solar PV facilities change ownership frequently.** Write permit conditions such that they are clear and enforceable. Require the transfer of all permitting documents to any new owners as a condition of the permit.

# TIPS TO REMEMBER

## CONSERVATION COMMISSION

- **MA DEP Guidance** – Review guidance on permitting of solar PV arrays provided by the Massachusetts Department of Environmental Protection: https://www.mass.gov/guides/massdep-wetlands-program-policy-17-1-photovoltaic-system-solar-array-review#-siting-photovoltaic-systems-
- **Don't be afraid to contact your MassDEP circuit rider with questions**.
- **Follow Open Meeting Laws and Required Timelines** – This is ALWAYS legally required, but because development of CPSIs may be controversial, with a good deal of money wrapped up in their development, it is especially important to 'dot every i and cross every t' to avoid possible litigation.
- **Coordinate with the Site Plan Approval Authority and Special Permit Granting Authority** - (often the Planning Board of Zoning Board of Appeals)
- **Third Party Consultation** – Third-party review of wetland boundaries and stormwater management plans is allowable under Massachusetts law, and should be paid for by the project proponent.
- **The Commission can require regular site checks** during construction and following storm events– weekly, if necessary.
- **The Commission can use its discretion in the wetland buffer zone**, and apply appropriate Special Conditions in the Order of Conditions.
- **The Commission can require limited vegetation clearing in the trim zone**, and apply appropriate Special Conditions in the Order of Conditions.

## Consultation with other Agencies and Municipal Boards

In cases where a Site Plan Review is required, the permitting process will be overseen by the Site Plan Review Authority, in consultation with other boards and departments as needed. For projects which require a Special Permit, this Special Permit Approval Authority will then need to determine whether a Special Permit can be granted, and to set appropriate conditions. The Site Plan Review Authority and Special Permit Approval Authority may or may not be the same entity, depending on the permitting structure laid out in the municipality's bylaws.

In most cases, the Conservation Commission only becomes directly involved in the permitting process if work activities associated with development of the solar array are to occur in jurisdictional areas defined under the Massachusetts Wetland Protection Act (WPA). These areas are defined in detail in the WPA, but typically include areas within 100 feet of a wetland or water body, or 200 feet of most rivers and streams. Because commercial-scale solar projects often involve clearing of large tracts of land, they have the potential to affect wetlands and water bodies, even if those areas are greater than 100 feet away. However, the Conservation Commission has no authority outside its jurisdictional area based on the potential for a project to affect a wetland – it can only come in after the fact, if a jurisdictional area is negatively affected in a way that violates the WPA. For any project that has the potential for run-off or erosion into a wetland or water body, members of the Conservation Commission should be included in meetings of the Site Plan Approval Authority in an advisory role. Even in cases where the Conservation Commission has direct jurisdictional authority, it is important for town boards to coordinate closely, to ensure that the requirements laid out for permitting are consistent and do not work at cross-purposes.

Other entities that may be involved in environmental permitting relating to proposed solar PV projects include the Massachusetts Department of Environmental Protection (as above, under the Wetland Protection Act), the Massachusetts Natural Heritage and Endangered Species Program (within rare species habitat, under the Massachusetts Endangered Species Act), the Department of Conservation and Recreation (in public water supply zones, under the Watershed Protection Act), and the federal Army Corps of Engineers (under the Clean Water Act). The Massachusetts Department of Agricultural Resources (MDAR) may specifically be involved in projects related to agriculture.

## Third-Party Review of Stormwater Management Plans

Due to the complexity of large, land-altering solar developments, it is recommended that an independent third party review all stormwater and erosion control and sedimentation controls and plans as part of the Site Plan Approval process. The applicant's engineering and site plans should be reviewed by a licensed third-party engineering review. Usually, municipalities have engineering firms on call who can perform this review in advance of a hearing by the boards on these applications. If the municipality has adopted MGL Chapter 44, Section 53G, the municipality may require that the third-party review be paid for by the applicant.

If approved, it will be important for the municipality to ensure successful implementation of the stormwater management plan and ongoing maintenance of mitigation measures. These measures can be addressed in an approval upon conditions, through sufficient performance security requirements and long-term maintenance provisions.

MGL Chapter 44, Section 53G authorizes the establishment of a special account by certain local boards including the Planning Board or Conservation Commission, for the employment of outside consultants (i.e., peer review of technical issues like peer civil engineering review or traffic peer review) using funds supplied by an applicant for a permit.

Pursuant to section 53G, a board must adopt regulations, through a simple vote of the board to adopt, in order to establish an account.

The account is established by the treasurer with funds segregated from other municipal accounts The funds, plus interest earned, in such account can be expended by the board without appropriation. Usually, a contract is entered into with the consultant only upon receipt by the board of the funds necessary to pay the consultant. Upon completion of review of a project, any excess funds plus interest shall be repaid to the applicant. The treasurer of the municipality must submit annual reports on such special accounts to the Select Board, Town or City Council, Mayor, or City Manager. All contracts awarded under the provisions of section 53G must comply with the bidding laws of MGL Ch 30B.

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# APPENDIX

A - INSTRUCTIONS AND COMPLETE APPLICATION CHECKLIST
B - RESOURCES REGARDING AGRICULTURAL EXEMPTION
C - EXAMPLE SOLAR MORATORIUM BYLAW/ORDINANCE
D - SAFETY IN ENERGY STORAGE
E - EXAMPLE TREE REPLACEMENT BYLAW/ORDINANCE
F - SAMPLE MUNICIPAL BYLAWS/ORDINANCES
G - SAMPLE PILOT AGREEMENT
H - ADDITIONAL RESOURCES

# A INSTRUCTIONS AND COMPLETE APPLICATION CHECKLIST

- Town of East Longmeadow

**Town of East Longmeadow**
**Department of Planning and Community Development**
**60 Center Square**
**East Longmeadow, Massachusetts 01028**
**(413) 525-5400 - ext. 1700**

# INSTRUCTIONS FOR FILING
# SPECIAL PERMIT, SITE PLAN REVIEW, and SUBDIVISION PLAN APPLICATIONS

## COMPLETE APPLICATION PACKETS

For Special Permits, Site Plan Review, and Subdivision Plans, prior to filing application packets with the Planning Board, the applicant shall review the contents of the packet with Planning & Community Development staff for completeness. After the applicant receives approval from Planning & Community Development staff, the applicant shall bring the packets to the Town Clerk to have the submittals date/time stamped and certified by the Town Clerk. Submittals shall be returned to the Planning and Community Development Department on the same date as part of the COMPLETE APPLICATION PACKET.

The Planning and Community Development Department will only accept a COMPLETE APPLICATION PACKET. All submitted materials should be typed or legibly printed. Fillable forms are available on the Town's website at:
https://www.eastlongmeadowma.gov/286/Planning

**A COMPLETE APPLICATION PACKET must include all of the following:**

1. A ZONING DETERMINATION, with original signatures, signed by the Building Commissioner.
2. Eight (8) hard copies of the executed Zoning Determination (submit this request at least 10 days prior to your anticipated application submittal).
3. A fully completed APPLICATION FORM with original signatures and with the date and time of the filing certified by the Town Clerk.
4. Eight (8) hard copies of the executed APPLICATION FORM.
5. Eight (8) complete sets of all Supporting Materials, as applicable (Plan review application check list, Narrative, Deed of Ownership, Waiver Request Form, Photos, Drainage Report, Traffic Impact Study, Maps, Development Impact Statement).
6. Determination of Applicability submitted to the Conservation Commission (If applicable)
7. Five (5) Storm water Drainage Reports (if applicable)

8. Site Plans and Architectural Elevations (plans should bear the seal of an architect, landscape architect or professional engineer of appropriate discipline licensed in Massachusetts).

   a. Two separate site plans showing: 1) Existing Conditions 2) Proposed Conditions

   b. Three (3) sets of the plans shall be full sized (24"x36")

   c. Six (6) sets shall be 11"x17"

   PLEASE NOTE: If filing an Application Not Required (ANR) the following is required:

   - Two (2) Mylar Plans
   - One (1) full sized (24"x36")

9. Required Filing Fee.

10. **Two sets** of pre-stamped, BLANK envelopes for mailing out required "parties of interest" notifications.

11. Twelve (12) additional pre-stamped, blank envelopes for notice to surrounding municipalities.

12. A TAX COLLECTOR AFFIDAVIT signed by the East Longmeadow Tax Collector (or designee).

13. A CERTIFIED LIST OF ABUTTERS from the Assessor's Office (submit this request at least 10 days prior to your anticipated application submittal).

14. Digital PDF files on a USB device containing the items listed above.

**STEPS:**

1. Depending on the scale and complexity of the project, it is suggested that the Planning and Community Development Director be consulted early in the project planning process.

2. FILE A ZONING DETERMINATION APPLICATION WITH THE BUILDING DEPARTMENT (submit this request at least 10 days prior to your anticipated application submittal).

   This will formally determine what zoning approvals are needed and, if so, by which permit granting authority (Planning Board, Board of Appeals, or Town Council).

3. COMPILE APPLICATION MATERIALS (see COMPLETE APPLICATION PACKET)

4. Before submitting the packet to the TOWN CLERK, submit the COMPLETE APPLICATION PACKET (see COMPLETE APPLICATION PACKET) to the Planning and Community Development Department staff for final review.

5. Submit application with original signatures and one application copy with the Town Clerk to be date/time stamped. This constitutes the official filing date of the application. Leave one date/time stamped packet with Town Clerk.

6. The Planning and Community Development Department will schedule the required meeting date for the application for which the applicant and "parties of Interest" will be mailed notifications.

7. For larger or complicated projects an informal project review/pre permitting meeting may be held with relevant departments to which the applicant will be invited to attend to informally present and discuss the project with various town departments and solicit input. This will likely be conducted prior to the Public Hearing meeting.

8. The Planning Board will conduct the Public Hearing at which the applicant will be given the opportunity to present the project. "Parties in interest" will also have the opportunity participate. The Public Hearing may be continued to a future meeting(s) by the Planning Board to request additional materials and information.

9. Once the Planning Board has determined that they have received all of the relevant information that they require to render a Decision, they will close the Public Hearing and render a Decision.

10. Within fourteen (14) days of the close of hearing, the Planning Board will file its Decision with the Town Clerk, which will be date/time stamped. This will constitute the date on which the Appeal period starts.

    The Applicant and any "parties in interest" have 20 days from this date to file an appeal of the Planning Board's Decision in Court.

11. The applicant will be mailed a copy of the Decision.

12. At the expiration of the 20 day Appeal period the applicant shall go to the Town Clerk's Office and receive the Planning Board's Decision endorsed by the Town Clerk that the 20 Day Appeal period has expired with no appeals being filed.

13. The Applicant must record the Special Permit Decision, Site Plan Approval and Plans, and/or Subdivision Certificate of Approval Decision at the Hampden County Registry of Deeds in order for it to become effective. A copy of the recorded document shall be returned to the Planning and Community Development Department.

**Case Number:**

# Plan Review Application Checklist

In order for the town of East Longmeadow Planning Board to accurately review your project in a timely manner, plan sets submitted with applications must be complete and thorough. A comprehensive understanding of this handout and submittal of all required documents and plans ensures an efficient review of your project.

Unless otherwise noted or determined by Planning and Community Development Department Staff to not be required, the following information and drawings must be included in the submittal package for your application. For an application to be accepted, each and every item is required at the time of application submittal.

In certain instances, plans, or portions of plans, may be waived when not applicable for the review of a particular type of development, at the discretion of the Planning and Community Development Director. Requests for any such waiver(s) must be submitted, in writing, to the Planning and Community Development Department for consideration prior to application submittal.

All submitted materials must be legible, organized & bound (where appropriate) in a manner that allows for distribution of all proposal materials as one (1) package. Please utilize double-sided printing for submitted reports, studies and statements when possible.

**Initials Indicate Items Submitted**

| Staff | Applicant | |
|---|---|---|
| | | **1. Completed Application Form** (with all required signatures; 8 Copies) |
| | | **2. Completed Plan Review Application Checklist** (1 original & 7 copies) |
| | | **3. Plans** |

- ☐ Three (3) stapled and folded sets of full-sized plans (24" x 36") and six (6) sets of reduced plans (11" x 17") are required for all applications. Staff reserves the right to require additional copies.
- ☐ One (1) electronic copy (PDF) of all proposed activity plans (See Section 10 of checklist for requirements)
- ☐ All plans oriented so that north arrow points to top of sheet
- ☐ Plans shall be drawn at a minimum scale of 1"= 40' or less
- ☐ All plans shall be stamped by Commonwealth of Massachusetts Registered Professional Engineer, Professional Land Surveyor, Professional Landscape Architect, and/or Architect, as appropriate
- ☐ Plan sets shall be comprised of separate sheets as listed below unless otherwise approved by the Planning and Community Development Director
- ☐ All plans shall have a title block comprised of the following: Project Title, Sheet Title, Sheet Number; Registrant Stamp (i.e., PE, PLS, LA, RA); Registrant's name and address; Street addresses of the project area parcels; Scale at which the plan is drawn; Plan Issue Date; and all plan revision dates (with corresponding revision descriptions).

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**3a. Cover Sheet**, to include the following information:

□ **Title Block**

- Project name/title
- Assessor's map and parcel number(s)
- Name and address of property owner(s)
- Name and address of developer
- Name and address of Engineer / Architect/ Landscape Architect
- Revision Date Block
- Street Number and/or Lot Number
- HCRD Registry Book and Page (to include previous land plans and recorded deed book and page numbers)

□ **Zoning Requirements Table** (Indicate Required vs. Provided)

- Zoning District
- Lot Area
- Lot Frontage
- Front, Side & Rear Setbacks of Buildings and Parking Areas
- Building Height
- Lot Coverage Percentage
- Green Space
- Off-Street Parking Spaces
- Compact Parking Spaces
- Accessible Parking Spaces
- Van Accessible Parking Spaces
- Screening Buffers
- Percentage of Lot that is Upland
- Total Square Footage of Upland

□ **Locus Map** (At a scale of 1 inch = 100 feet, showing the entire project and its relation to existing areas, buildings, and roads within a distance of 1,000 feet from the project boundaries, or such other distances as may be approved or required by the Planning Board.)

□ **Plan Index** with latest revision date of each individual plan

□ **Flood Insurance Rate Map (FIRM) with effective date**

□ **Soils Map**

**3b. Existing Conditions Plan**

□ Name of Surveyor or Surveyor Firm

□ Date of survey

□ Property lines with bearings and distances

| Staff | Applicant |
|---|---|

- ☐ Monuments set/found at all lot corners
- ☐ Easements with bearings and distances suitable for registry filing
- ☐ Names of all abutters and zoning district
- ☐ Street names
- ☐ Benchmark locations (Based on USGS NGVD 88. Datum may not be assumed)
- ☐ NHESP mapped areas (Areas of Estimated and Priority Habitats)
- ☐ Existing 21E Contaminated Site Information
- ☐ Existing Buildings and Structures
  - ☐ Area of building
  - ☐ Number of stories

- ☐ Principal use
- ☐ Door locations with sill elevation
- ☐ Setbacks from property lines
- ☐ Floor elevations
- ☐ Existing Topography:
  - ☐ Contours at 2' intervals (1' contours or additional spot grades if site is flat)
  - ☐ Overhead and underground utilities including but not limited to water, sewer, drainage, electric, telephone, cable TV, gas, septic systems, detention structures, wells
  - ☐ Existing parking/paved areas including pavement type (parking, walkways, etc.)
  - ☐ All existing curbcuts
  - ☐ Listing of all existing utility owners and contact info located within the project limits
  - ☐ Adequate utility information outside the site to verify proposed utility connections
  - ☐ All utility pipe types, sizes, lengths, and slopes
  - ☐ All utility structure information including rim and invert elevations
  - ☐ All existing easements within 50 feet of property line-Identify any utility within the easement
  - ☐ All existing utility easements with bearings and distances
  - ☐ Existing pavement markings within site and on connecting roads
  - ☐ Existing features such as walls, curbing, landscaping, trees, walks, fences, trees 18 inches DBH (diameter at breast height), lighting, poles, guys, signs, loading areas, fire hydrants, dumpster locations, known buried slabs, etc.
  - ☐ Wetlands, floodplain, water protection district delineation including offsets and buffer zones
  - ☐ Streams, water courses, swales, and all flood hazard areas
  - ☐ Rock outcroppings
  - ☐ Test pit locations including groundwater depths when encountered
  - ☐ Historic buildings within 250 feet of the subject property

**3c. <u>Demolition Plan</u>**

- ☐ **Existing Conditions Plan plus:**
  - ☐ Existing Buildings and Structures to be removed/demolished

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|---|---|---|
| | | ☐ Existing parking/paved areas to be removed/demolished |
| | | ☐ Existing utilities to be removed/demolished |
| | | ☐ Existing hydrants to be removed |
| | | ☐ Existing features to be removed/ demolished such as walls, curbing, landscaping trees, walks, fences, trees 18" DBH or greater, lighting, poles, guys, signs, etc. |
| | | ☐ Dust Control Measures |

☐ Proposed construction phase drainage infrastructure plan including (but not limited to) piping and natural watercourse profiles & cross-sections, retention/detention structures, drain manholes, catch basins, gutter inlets, headwalls, water quality BMPs, and erosion & sedimentation control features, etc.

**_____3d. Construction/Layout Plan/Site Plan**

☐ Proposed Buildings and Structures

- ☐ Area of building or additions
- ☐ Number of stories
- ☐ Principal use of structure
- ☐ Floor elevations
- ☐ Door locations with sill elevations
- ☐ Setback dimensions from property lines
- ☐ Out-buildings, detached garages, temp. construction trailers, etc.

☐ Proposed Topography, including but not limited to:

- ☐ Proposed contours at 2' intervals
- ☐ Parking lot setbacks to property line
- ☐ Parking lot grades (not to exceed 5% or be less than 0.5%)
- ☐ Walls
- ☐ Parking spaces (delineated and dimensioned)
- ☐ Accessible parking spaces & aisles
- ☐ Wheelchair ramps
- ☐ Sidewalks
- ☐ Pavement type(s)
- ☐ Curb type(s) and limits
- ☐ Lighting / Poles / Guys
- ☐ Signs (include sign schedule)
- ☐ Pavement markings
- ☐ Loading areas / Loading Docks / Platforms
- ☐ Fences
- ☐ Landscape areas
- ☐ Dumpster(s), Compactor(s) & Pads
- ☐ Spot Grades at four ( 4) Building Corners
- ☐ Overall Plan Showing Areas of Cut & Fill

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☐ Critical dimensions including aisle widths, parking stall dimensions, curb radius, driveway openings, etc.

- ☐ Grading at entrance-show spot grades, if required
- ☐ Emergency Vehicle Access
- ☐ Truck Access (WB-50 unless otherwise approved by Department of Public Works)
- ☐ Snow Storage Areas
- ☐ Construction notes (including the following notes):
    - ☐ Any minor modifications (as determined by the Department of Public Works and Planning and Community Development Director) to the information shown on the approved site plans shall be submitted to the Department of Public Works as a Minor Plan Revision for approval prior to the work being performed.
    - ☐ Any work and material within the Town right-of-way shall conform to the Town of East Longmeadow requirements
    - ☐ All handicap parking, ramps, and access shall conform to AAB & MAAB requirements
    - ☐ All erosion control measures shall be in place prior to construction. Erosion Control shall conform to the East Longmeadow Conservation Commission requirements as stated in the Order of Conditions. (Refer to Erosion Control Plan if part of submission)
    - ☐ All pavement markings and signs shall conform to MUTCD requirements

**3e. <u>Grading and Drainage Plan</u>**

- ☐ **Existing Conditions Plan and Construction/ Layout/ Site Plan plus:**
- ☐ Existing and proposed site grading/ topography-Contours at 2' intervals (1' contours or additional spot grades, if slight is flat)
- ☐ Proposed parking lots, sidewalks, islands, etc.
    - Parking lot grades shall not exceed 5% or be less than 0.5 %
- ☐ Floor elevations & door locations
- ☐ Proposed drainage infrastructure plan including but not limited to piping and natural watercourse profiles & cross-sections, infiltration/ retention / detention structures, drain manholes, headwalls, roof recharge systems, flow direction, water quality BMPs, etc.
- ☐ Adequate information off site to verify proposed drain connections
- ☐ Drainage system profiles including rim and invert elevations, material, types, sizes, lengths, utility crossings and slopes
- ☐ Utility easements with bearings and distances suitable for Hampden County Registry of Deeds filing
- ☐ Delineation of all stockpile areas
- ☐ Provide safety fencing around stockpiles over 10' in height or otherwise restrict site access
- ☐ For applications associated with residential or commercial/industrial subdivisions, include an overall development plan showing all construction activity and proposed grading for all project phases, and

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show the proposed building envelope within each house lot and the proposed grading, drainage, and storm water disposal for each lot.

- ☐ A design for the stormwater drainage systems prepared by a Registered Professional Engineer demonstrating that proposed development rates of runoff do not exceed pre-development rates, as required under Massachusetts Stormwater Management Standards.

_____ **3f. <u>Utility and Grading Plan</u>** (Show appropriate info from Existing Conditions & Construction/Layout/Site Plans)

- ☐ Include all proposed utilities, including, but not limited to, Water, Sewer, Drainage, Electric, Telephone, Cable TV, Gas, Lighting, Title V Septic Systems & Detention and Retention Structures
    - ☐ Adequate utility information outside the site to verify proposed utility connections
    - ☐ All utility pipe types, sizes, lengths, and slopes
    - ☐ All utility structure information including rim and invert elevations
    - ☐ Any utility access vaults
    - ☐ All utility access handholes
    - ☐ All water services, hydrants, gates, shutoffs, tees
    - ☐ Utilities shall be underground
    - ☐ All transformer locations
    - ☐ Required utility easements with dimensional bearings and distances
- ☐ Force main, if required, conforming to Town of East Longmeadow requirements
- ☐ Water main loop
- ☐ Sewer profile showing all utility crossings
- ☐ Sections through detention basin(s)
- ☐ Detention basin, retention basin or other stormwater mechanisms (such as infiltration devices), if proposed (All storm water plans must adhere to the new NPDES MS4 permit which have taken effect July 1, 2018).
- ☐ Include the following notes:
    - ☐ The contractor shall obtain a letter of approval from DPW prior to any construction within the right-of-way
    - ☐ All water and sewer material and construction shall conform to the Town of East Longmeadow requirements
    - ☐ All water and sewer construction shall be inspected by the Town of East Longmeadow before being backfilled
    - ☐ The Town shall be notified at least 24 hours prior to the required inspections

_____ **3g. <u>Landscape Plan</u>**

- ☐ Location, species, and size of all proposed plantings
- ☐ All existing landscaping to be removed or retained
- ☐ Plant and tree legend

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- ☐ Delineate & label all existing and proposed groundcovers, lawn areas, driveways, walkways, patios and other surface treatments
- ☐ Snow storage areas
- ☐ Proposed irrigation methods (on-site wells to be used unless otherwise approved)
- ☐ Verify sight distances at entrances
- ☐ Include the following notes:
    - Planting period shall be noted as March 15 - May 15 and September 15 – November 15, weather permitting
    - Owner is responsible for maintaining live vegetation, and the maintenance, removal and replacing of all dead trees, shrubs, ground cover and plants

**3h. Erosion Control Plan** (show appropriate information from Existing Conditions and Construction/Layout/Site Plans)

- ☐ Straw bales or straw bale/silt fence combination and compost filter tubes
- ☐ Anti-tracking BMP area at all construction entrances
- ☐ Dust Control (Methods of)
- ☐ Protection of existing and proposed drainage structures with straw bales and/or silt sacks
- ☐ Delineation of all temporary stockpile areas
- ☐ Safety fencing around stockpiles over 10' in height or otherwise restricted site access
- ☐ Straw bales or straw bale/silt fence combination around all stockpiles
- ☐ Include the following notes:
    - All BMP erosion control measures shall be in place prior to demolition or any site work.
    - Erosion Control BMPs shall conform to US EPA, NPDES, MA DEP and Massachusetts Erosion and Sedimentation Control Guidelines for Urban and Suburban Areas.
    - Maintenance specifications for all proposed erosion and sedimentation controls.

**3i. Building Elevations**

- ☐ Show all structural building elevations (front, sides and rear facades)
- ☐ For additions/alterations: label existing and new construction, as well as items to be removed
- ☐ Identify all existing and proposed exterior materials, treatments and colors - including roofing, roof eaves, eave brackets, siding, doors, trim, sills, windows, fences, and railings, etc.
- ☐ Show details of proposed new exterior elements
- ☐ Show any exterior mechanical, duct work, utility boxes, satellite dish, etc.
- ☐ Include dimensions for building height and wall length and identify existing and proposed floor elevations
- ☐ Provide Sample Boards of proposed finish materials
- ☐ For alterations to any existing or new business/commercial/industrial uses, show a table containing the following:

- Maximum area of building to be used for retail/sales, office, business, industrial or other use
- Maximum number of employees, where applicable

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- Maximum seating capacity, where applicable
- Hours of operation
- Number of parking spaces existing or required for the intended use

**3j. Sign Plan**

☐ Fully-dimensioned color elevations for all proposed signs

☐ Total square footage of existing signs and total square footage of proposed signs

☐ Existing and proposed sign locations on site plan, to include directional signs

☐ Existing and proposed materials and methods of lighting for all signs

**3k. Lighting Plan**

☐ Location and orientation of all existing and proposed exterior lighting, including building and ground lighting and emergency spot lighting (if any)

☐ Height and initial foot-candle readings on the ground and the types of fixtures to be used

☐ Plan must show illumination patterns on-site and areas off-site

☐ Provide Cut Sheet for all lighting fixtures

**3l. Detail Sheets (Typical Details)**

☐ Pavement Section Detail
☐ Sidewalk Detail
☐ Curb Detail
☐ Driveway Detail
☐ Wheel Chair Ramp Detail
☐ Concrete Pad Detail
☐ Catch Basin Detail
☐ Drainage Manhole Detail
☐ Silt Sac Detail
☐ Water and Sewer Trench Sections
☐ Anti-Seepage Collar Detail
☐ Flared End Detail
☐ Rip Rap Detail
☐ Straw Bales/Silt Fence Detail
☐ Compost Filter Tube Detail
☐ Light Pole Foundation Detail
☐ Sewer Manhole Detail (26" cover)
☐ Detention/Retention Basin Sections (from plan)
☐ Detention Basin Outlet Structure Detail
☐ Miscellaneous Detention/Retention Basin Details
☐ Infiltration Device Details
☐ Stormwater BMPs (Water Quality Structure Details, etc.)
☐ Bollards
☐ Tree/Shrub Planting Detail
☐ Sign Detail
☐ Fence Detail
☐ Flowable Fill Trench
☐ Pavement Marking Details
☐ Handicap Parking/Compact Parking Signs
☐ Hydrant Detail: American-Darling B-62-B Open Right) or Mueller Super Centurion Silt Sac Detail Hydrant (Open Right)
☐ Thrust Block Detail
☐ Retaining Wall Details

_____ **4. <u>Project Narrative</u>** (15 Copies), to include adequate summary & description of the proposed project and indicating, where appropriate:

| Staff | Applicant | |
|---|---|---|
| | | □ The number of dwelling units to be built and the acreage in residential use |
| | | □ Evidence of compliance with parking and off-street loading requirements |
| | | □ The forms of ownership contemplated for the property and a summary of the provisions of any ownership or maintenance thereof |
| | | □ Identification of all land that will become common or public land |
| | | □ Any other evidence necessary to indicate compliance with the zoning ordinance |
| | | □ A written statement indicating the estimated time required to complete the proposed project and any and all phases thereof |
| | | □ A written estimate showing, in detail, the projected costs of all site improvements (and off-site improvement) planned |
| | | □ Drainage calculations by a registered professional engineer, with storm drainage design conforming to Town of East Longmeadow stormwater regulations, as well as wetland delineations determined by a certified wetland scientist, if applicable, for 1, 10, 25 & 100 year storm events |

_____ **5. <u>Certified Abutters List</u>** (15 copies)

_____ **6. <u>Proof of Ownership</u>** (Copy of Deed(s) for All Involved Parcels; 15 Copies)

_____ **7. <u>Development Impact Statement (DIS)</u>** (15 Copies), if required by the Planning Board

_____ **8. <u>Traffic Impact & Access Study (TIAS)</u>** (15 Copies), if required by the Planning Board

_____ **9. <u>Stormwater Management Report</u>** (15 Copies), if required, comprised of the following:

- □ MADEP Stormwater Standards Compliance Checklist (signed & stamped)
- □ Overall Project Description
- □ Existing Conditions
- □ Proposed Improvements
- □ Proposed Conditions
- □ Hydrologic Analysis for Existing & Proposed Conditions for Milestone Storm Event Intensities
- □ Stormwater Management Regulations
- □ Summary
- □ Appendix - Existing/Proposed Conditions Plans showing the following:
    - Overall Existing Subcatchment Area Table
        - Subcatchment Labeled, Design Point, Area, Curve number, Tc (min.)
    - Soil Classifications Table (Existing Soils)
        - Map Unit Symbol, Map Unit Name, Hydrologic Soil Code
    - Overall Proposed Subcatchment Area Table
        - Subcatchment Labeled, Design Point, Area, Curve number, Tc (min.)
    - Soil Classifications Table (Including Proposed Boron Soils, Etc., if applicable)

- Map Unit Symbol, Map Unit Name, Hydrologic Soil Code

□ Appendix - Hydrologic Analyses

| **Staff** | **Applicant** |
|---|---|
| | ▪ HydroCAD Software Analyses (or equivalent software) Analyses (Existing & Proposed Conditions) |
| | □ Appendix - Illicit Discharge Certification (signed & dated) |
| _____ | _____ **10. Electronic PDF and AutoCAD Files** |
| | □ Shall consist of a CD with a printed CD Label in a CD case or USB Drive in PDF Format |
| | □ PDF files shall be created from within the AutoCAD environment and contain Layer information. |
| _____ | _____ **11. Application Fee** (All fees are due at time of application submission) |

**Official Use Only:**

For the Planning Board, this application has been received by the Planning and Community Development Department on the date specified below:

Review date: _____ All materials submitted: Yes No

Signature:_____ Fee:_____

# B RESOURCES REGARDING AGRICULTURAL EXEMPTION

**Part I** ADMINISTRATION OF THE GOVERNMENT

**Title VII** CITIES, TOWNS AND DISTRICTS

**Chapter 40A** ZONING

**Section 3** SUBJECTS WHICH ZONING MAY NOT REGULATE; EXEMPTIONS; PUBLIC HEARINGS; TEMPORARY MANUFACTURED HOME RESIDENCES

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Section 3. No zoning ordinance or by-law shall regulate or restrict the use of materials, or methods of construction of structures regulated by the state building code, nor shall any such ordinance or by-law prohibit, unreasonably regulate, or require a special permit for the use of land for the primary purpose of commercial agriculture, aquaculture, silviculture, horticulture, floriculture or viticulture, nor prohibit, unreasonably regulate or require a special permit for the use, expansion, reconstruction or construction of structures thereon for the primary purpose of commercial agriculture, aquaculture, silviculture, horticulture, floriculture or viticulture, including those facilities for the sale of produce, wine and dairy products, provided that either during the months of June, July, August and September of each year or during the harvest season of the primary crop raised on land of the owner or lessee, 25 per cent of such products for sale, based on either gross sales dollars or volume, have been produced by the owner or lessee of the land on which the facility is located, or at least 25 per cent of such products for sale,

based on either gross annual sales or annual volume, have been produced by the owner or lessee of the land on which the facility is located and at least an additional 50 per cent of such products for sale, based upon either gross annual sales or annual volume, have been produced in Massachusetts on land other than that on which the facility is located, used for the primary purpose of commercial agriculture, aquaculture, silviculture, horticulture, floriculture or viticulture, whether by the owner or lessee of the land on which the facility is located or by another, except that all such activities may be limited to parcels of 5 acres or more or to parcels 2 acres or more if the sale of products produced from the agriculture, aquaculture, silviculture, horticulture, floriculture or viticulture use on the parcel annually generates at least $1,000 per acre based on gross sales dollars in area not zoned for agriculture, aquaculture, silviculture, horticulture, floriculture or viticulture. For such purposes, land divided by a public or private way or a waterway shall be construed as 1 parcel. No zoning ordinance or by-law shall exempt land or structures from flood plain or wetlands regulations established pursuant to the General Laws. For the purposes of this section, the term "agriculture" shall be as defined in section 1A of chapter 128, and the term horticulture shall include the growing and keeping of nursery stock and the sale thereof; provided, however, that the terms agriculture, aquaculture, floriculture and horticulture shall not include the growing, cultivation, distribution or dispensation of marijuana as defined in section 2 of chapter 369 of the acts of 2012, marihuana as defined in section 1 of chapter 94C or marijuana or marihuana as defined in section 1 of chapter 94G; and provided further, that nothing in this section shall preclude a municipality from establishing zoning by-laws or ordinances which allow commercial marijuana growing and cultivation on land used for

commercial agriculture, aquaculture, floriculture, or horticulture. Said nursery stock shall be considered to be produced by the owner or lessee of the land if it is nourished, maintained and managed while on the premises.

No zoning ordinance or by-law shall regulate or restrict the interior area of a single family residential building nor shall any such ordinance or by-law prohibit, regulate or restrict the use of land or structures for religious purposes or for educational purposes on land owned or leased by the commonwealth or any of its agencies, subdivisions or bodies politic or by a religious sect or denomination, or by a nonprofit educational corporation; provided, however, that such land or structures may be subject to reasonable regulations concerning the bulk and height of structures and determining yard sizes, lot area, setbacks, open space, parking and building coverage requirements. Lands or structures used, or to be used by a public service corporation may be exempted in particular respects from the operation of a zoning ordinance or by-law if, upon petition of the corporation, the department of telecommunications and cable or the department of public utilities shall, after notice given pursuant to section eleven and public hearing in the town or city, determine the exemptions required and find that the present or proposed use of the land or structure is reasonably necessary for the convenience or welfare of the public; provided however, that if lands or structures used or to be used by a public service corporation are located in more than one municipality such lands or structures may be exempted in particular respects from the operation of any zoning ordinance or by-law if, upon petition of the corporation, the department of telecommunications and cable or the department of public utilities shall after notice to all affected communities and public hearing in one of said municipalities, determine

the exemptions required and find that the present or proposed use of the land or structure is reasonably necessary for the convenience or welfare of the public. For the purpose of this section, the petition of a public service corporation relating to siting of a communications or cable television facility shall be filed with the department of telecommunications and cable. All other petitions shall be filed with the department of public utilities.

No zoning ordinance or bylaw in any city or town shall prohibit, or require a special permit for, the use of land or structures, or the expansion of existing structures, for the primary, accessory or incidental purpose of operating a child care facility; provided, however, that such land or structures may be subject to reasonable regulations concerning the bulk and height of structures and determining yard sizes, lot area, setbacks, open space, parking and building coverage requirements. As used in this paragraph, the term "child care facility" shall mean a child care center or a school-aged child care program, as defined in section 1A of chapter 15D.

Notwithstanding any general or special law to the contrary, local land use and health and safety laws, regulations, practices, ordinances, by-laws and decisions of a city or town shall not discriminate against a disabled person. Imposition of health and safety laws or land-use requirements on congregate living arrangements among non-related persons with disabilities that are not imposed on families and groups of similar size or other unrelated persons shall constitute discrimination. The provisions of this paragraph shall apply to every city or town, including, but not limited to the city of Boston and the city of Cambridge.

Family child care home and large family child care home, as defined in section 1A of chapter 15D, shall be an allowable use unless a city or town prohibits or specifically regulates such use in its zoning ordinances or by-laws.

No provision of a zoning ordinance or by-law shall be valid which sets apart districts by any boundary line which may be changed without adoption of an amendment to the zoning ordinance or by-law.

No zoning ordinance or by-law shall prohibit the owner and occupier of a residence which has been destroyed by fire or other natural holocaust from placing a manufactured home on the site of such residence and residing in such home for a period not to exceed twelve months while the residence is being rebuilt. Any such manufactured home shall be subject to the provisions of the state sanitary code.

No dimensional lot requirement of a zoning ordinance or by-law, including but not limited to, set back, front yard, side yard, rear yard and open space shall apply to handicapped access ramps on private property used solely for the purpose of facilitating ingress or egress of a physically handicapped person, as defined in section thirteen A of chapter twenty-two.

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.

No zoning ordinance or by-law shall prohibit the construction or use of an antenna structure by a federally licensed amateur radio operator. Zoning ordinances and by-laws may reasonably regulate the location and height of such antenna structures for the purposes of health, safety, or

aesthetics; provided, however, that such ordinances and by-laws reasonably allow for sufficient height of such antenna structures so as to effectively accommodate amateur radio communications by federally licensed amateur radio operators and constitute the minimum practicable regulation necessary to accomplish the legitimate purposes of the city or town enacting such ordinance or by-law.

# Smart Growth / Smart Energy Toolkit Modules - Agricultural Preservation

**Learn about the Smart Growth/Smart Energy Agricultural Preservation module.**

## Overview

Preserving agricultural land and farming in Massachusetts has been a high priority of state and local officials for several decades. Through a variety of state and local initiatives, opportunities have emerged to help ensure a viable agricultural economy and farmland preservation. Many communities have successfully protected agricultural land using an array of financial and legal tools.

## The Problem

We are losing agricultural lands and farming opportunities at an alarming rate. These losses create issues such as:

- dramatic alteration of the traditional New England landscape
- A growing dependence on imported food products, and
- A commitment to spending an ever-increasing portion of our food costs on transportation of these products.

Over 16,000 acres of open space is developed and lost in Massachusetts each year, much of it existing or retired farmland. These lands represent a tremendous cultural and historic resource for rural and suburban communities throughout the Commonwealth.

High real estate values in Massachusetts, along with the steady decrease in buildable areas, have increased pressure to develop what remains of agricultural open spaces in many communities. Lands that have been

used historically for farming or pasture, but lie in residential or commercial zones, are often considered "prime real estate" to the development community. These areas are generally clear of forest and have topography well-suited to a variety of land use developments.

High land values has made it very attractive for existing farmers, orchard owners or other agricultural enterprises to sell these lands to private developers. Most communities don't have the funds to "match" a developer's offer resulting in farmlands being converted into residential subdivisions at the expense of viewsheds, open space, local agricultural production and community character.

**Pressure to develop residentially zoned agricultural land in Massachusetts is enormous. Despite the existence of several state programs designed to maintain or preserve existing farmland, thousands of acres of these lands are vulnerable to prospective sprawl development. Communities should use the Open Space and Recreation Plan process to identify existing agricultural lands that should be preserved and the tools that would be most effective toward that goal.**

**Image taken from *Above and Beyond, Visualizing Change in Small Towns and Rural Areas*. Campoli et, al. APA Planners Press, 2001**

## Introduction to Agricultural Preservation

The goals of agricultural preservation in Massachusetts vary depending on the unique situations of each community.

- In some rural communities, the goal of agricultural preservation is to enable existing farmlands to remain viable through the use of restrictions programs and marketing projects or tax breaks.
- Other more suburban communities may want to see existing agricultural lands developed in ways that decrease the impacts from conventional subdivision activity and preserve significant amounts of the open areas.
- In urban areas, the focus may be less on preservation and more on providing access to agricultural opportunities not often found in densely developed areas.

There are a variety of ways to protect or promote agricultural opportunities in Massachusetts. The tools that are used will depend on the opportunities faced by a community and their goals for preserving or creating agricultural spaces:

**Chapter 61A -** The Chapter 61 Program provides a tax break to owners of recreational, forest or agricultural lands as long as the land remains in the specified use. It is important to note that Chapter 61 is an incentive program not a permanent protection of open space or farmland. Local planners should assume that all of theses lands in their community have development potential. **Changes were made to this law in 2006** (https://malegislature.gov/Laws/SessionLaws/Acts/2006/Chapter394).

**Agricultural Commissions -** These Commissions are formed by passing a local bylaw or ordinance and serve as advocates for local farms. Responsibilities can include protecting farmland, providing assistance for natural resource management, affording visibility to local farmers, and assisting local boards with community development decisions. **Ninety-one cities and towns have established Agricultural Commissions.** (/files/documents/2017/11/13/Agricultural%20Preservation%20towns.pdf)

**Right to Farm -** The Right to Farm is vested in all residents of the Commonwealth under Article 97 of the state Constitution. Communities interested in formally re-asserting that right within the community may pass a Right to Farm Bylaw that clearly states the priorities of the community relative to fostering agricultural activities and allowing farms to operate "with minimal conflict with abutters and Town agencies". The bylaw/ordinance also establishes the notification procedure for informing all residents of the Town of the community's status as a Right to Farm entity. You can **view a list of communities with a Right-to-Farm Bylaw** (/files/documents/2017/11/13/Agricultural%20Preservation%20towns.pdf).

**Agricultural Preservation Restrictions (APRs) -** This program is designed to protect the most productive agricultural lands in the Commonwealth and establishes permanent deed restrictions on agricultural lands, protecting them from any use that might diminish the area's agricultural potential. These deed restrictions are purchased with state funds that can be matched to some extent by municipal and in some cases federal funding as well.

**Community Gardens -** Community Garden programs have been successfully developed in cities such as Somerville and Lowell and provide residents with an opportunity to grow food or horticultural varieties in heavily urbanized settings. Gardens are often managed by community groups who allocate specific plots of land to citizens on an annual basis. These areas also provide community gathering for cultural and educational events.

**Farm Viability Enhancement Program (FVEP)-** The purpose of the FVEP is to improve the economic bottom line and environmental integrity of participating farms through the implementation of Farm Viability Plans. These farm plans, which are developed by teams comprised of farmers and other agricultural, economic and environmental consultants, suggest ways for farmers to increase their on-farm income through such methods as improved management practices, diversification, direct marketing, value-added initiatives and agritourism. In addition, Farm Viability Plans make recommendations concerning environmental and resource conservation concerns on participating farms

**Zoning Protections -** Communities concerned with the development potential of existing agricultural lands can adopt zoning bylaw amendments specifically designed to protect these open tracts of land. Perhaps the most straight forward approach is to implement true large lot zoning. Minimum lot sizes in these provisions generally range from 10 to 25 acres per unit and, as a result, are best suited to communities with vast areas of farmland. Densities should not go below these levels in order to achieve the desired end result of preserving wide open undeveloped areas. Other protections can include mandatory cluster or Open Space Residential

Design (OSRD) provisions for existing farmland. These provisions ensure that the protection of open space will be maximized as lands transition from farmland to residential development.

**Transfer of Development Rights (TDR) -** This technique is better suited to Massachusetts communities where individual farms are considerably smaller than in other areas of the country where true large lot zoning has been used to preserve open space in agricultural areas.

TDR provides an excellent opportunity to blend down-zoning with incentives for increased density. In agricultural communities, undeveloped agricultural lands can be designated as "sending areas" where the amount of development that would ordinarily be allowed on the parcel is transferred to a pre-designated "receiving area". In other words, the development potential of one area is added on to the development potential of another.

*Existing Village vs. Conventional Development vs. Development with TDR*

## Characteristics that Support Agricultural Preservation

Communities that have success in preserving farmland and agricultural preservation will generally have the following characteristics:

- **Well Organized Parcel Information.** Having access to a well organized Assessor's database that identifies preservation and development opportunities is a critical first step to planning for agricultural preservation. Communities that have implemented a GIS Assessor's database have a clear advantage when prioritizing lands for preservation. Other local initiatives, such as Open Space and Recreation Plans, can serve as an excellent source of information relative to Chapter 61A lands and other farmlands in a community.
- **Committed Core Citizens Group.** Institutionalizing preservation efforts in the form of Agricultural Commissions, Agricultural Preservation Restrictions or Community Gardens often hinges on a reliable group of citizens with administrative skills and a solid understanding of the local tools and state-level programs that apply to these situations.
- **Open Lines of Communication.** Regular outreach efforts are a required component of a successful Right-to-Farm initiative and local Commissions must develop a consistent forum for individuals to raise issues, resolve conflicts and plan for the future of agricultural lands.

- **Local Commitment in the General Population.** Agricultural Preservation efforts often require community-wide support. It is therefore essential for communities involved in these efforts to continually reach beyond the primary stakeholders in the agricultural community and into the overall population to support local initiatives.

## Benefits

Over ninety Agricultural Commissions have been created in Massachusetts to help preserve agricultural lands and farming operations in their community. In these communities and many others, local officials have leveraged funding to help finance more than 500 APRs statewide, which span thousands of acres of active or retired farmland. Targeted production efforts have also successfully decreased local commitments to imported products. The work of local Commissions, in collaboration with state agencies, has helped to maintain a $6 billion  revenue stream for an industry that pays $77 million each year in wages.

These types of agricultural preservation measures directly or indirectly satisfy several of the Massachusetts Sustainable Development Principles including:

- **Plan Regionally:** Preserving farmland and agricultural opportunities has obvious economic significance to the state as a whole and is consistent with long standing Massachusetts policies.
- **Concentrate Development and Mix Uses:** Preservation techniques that mandate cluster development in agricultural areas concentrate development in a way that preserves land while expanding housing opportunities in a municipality.
- **Use Natural Resources Wisely:** The preservation of agricultural lands conserves existing natural resources by maintaining recharge to groundwater and maintaining open space.
- **Protect Land and Ecosystems:** Conservation restrictions that may be placed on existing agricultural lands can provide permanent protection for wildlife habitat and significant cultural or historic landscapes.
- **Increase Job and Business Opportunities:** Efforts to preserve and enhance the viability of existing agricultural operations foster local economies and strengthen sustainable resource-based businesses.

## Financial Considerations

Agricultural preservation can provide several financial benefits to municipalities and to the development community:

- Limiting development in outlying agricultural areas will reduce municipal infrastructure and service costs that would result from large scale subdivision development.
- If development rights are transferred as part of a preservation technique, private developers can realize significant financial gains through an increase in the development potential in "receiving areas" such as village centers or established residential neighborhoods.

Other financial considerations include:

- the amount of money that may be needed by a community to purchase lands that are withdrawing from the Chapter 61A program.
- the likelihood of success of any proposed APR will be increased if a municipality can provide a portion of the funding required to purchase the deed restriction.

Another direct economic benefit of agricultural preservation comes from maintaining a viable local agricultural economy. Producing more local agricultural products reduces dependence on foreign and out-of-state operations, reduces shipping expenses and oil consumption, and strengthens local economies. Locally grown products employ Massachusetts farmers and substantially reduce the costs and impacts of large scale interstate transport.

RELATED

Case Studies - Agricultural Preservation (/service-details/case-studies-agricultural-preservation)

# C EXAMPLE SOLAR MORATORIUM BYLAW/ORDINANCE

- Pioneer Valley Planning Commission

***Example Language for a Temporary Moratorium on the Construction of Large-Scale Ground-Mounted Solar Photovoltaic Installations***

*Italic text highlighted in GRAY represents instructions, and not text to be included in the Moratorium. Text highlighted in YELLOW should be updated to match the circumstances of the Town.*

Article I: Temporary Moratorium on the Construction of Large Ground Mounted Photovoltaic Installations

1.1 Authority and Purpose

The Town of _____ ("Town") currently has ____ approved ground mounted photovoltaic installations, commonly referred to "solar farms", completed or under construction and another _____ that have been approved and are in the permitting process. Many of these projects have involved large-scale clear cutting of trees and ground vegetation and several have been located in close proximity to abutting residential neighborhoods.

*For towns with an existing solar zoning bylaw:*
Although the Zoning Bylaw adopted pursuant to the vote on _____ and amended at a(n) _ _____ Town Meeting as Article # on DATE addresses ground-mounted photovoltaic installations, the Town needs to adopt further changes to the Zoning Bylaw to protect environmental resources and provide more efficiency for those property owners who seek to develop solar facilities as an accessory use. It is crucial that the Town act to establish a temporary moratorium on the use of land and the construction related to large ground mound photovoltaic installations and the issuance of building permits in connection with the same.

*For towns with no existing solar zoning bylaw:*

The Town of _ has yet to develop specific requirements with regard to large ground mounted solar photovoltaic installations. There is an immediate identified need to protect the interests of the Town and its citizens by establishing long term zoning bylaw standards and provisions to ensure that such uses and development will be consistent with the Town's long term planning interests and Master Plan.

1.2 Temporary Moratorium

The purpose of this moratorium is to allow the Town sufficient time to engage in a planning process to address the effects of such structures and uses in the Town and to enact bylaws in a matter consistent with sound land use planning goals and objectives. Because the regulation of ground mounted photovoltaic installations raises novel legal, planning and public safety issues, the Town needs time to undertake a planning process to make appropriate amendments to the Zoning Bylaw regarding regulation of Ground Mounted Photovoltaic Installations. Accordingly, the Town intends to adopt a temporary moratorium on the use of land and structures in the Town

**Comment [KC1]:** Use defined term (in zoning bylaw) related to ground mounted solar. Use throughout bylaw text.

**Comment [ZD2]:** Provide local context regarding need for amendment.

**Comment [ZD3]:** Some dates/context as to the amendments to your ground mounted solar zoning bylaw could be helpful, if adopted per this process.

**Comment [ZD4]:** ...or other identifiable community planning document.

for Ground Mounted Photovoltaic Installations [provide size limitation – e.g. "over X kW DC in capacity" or "with a project footprint over X acres in size] until Future date to allow the sufficient time to address the effects of such structures and uses in the Town and to enact appropriate Zoning Bylaws in a consistent manner. Notwithstanding any other provision in the Town of _____ Zoning Bylaw to the contrary, no building permit may be issued for the construction of any Ground Mounted Photovoltaic Installation over X in size and to the extent legally permissible, the Planning Board shall not accept any further application for any Ground Mounted Photovoltaic Installation over X in size during the aforementioned moratorium period. This moratorium shall not apply to any Ground Mounted Photovoltaic Installation for which a Site Plan Review or Special Permit application was received by the Planning Board prior to 1st posting date of public notice for bylaw amendment. Any Ground Mounted Photovoltaic Installation proposed in an application submitted to the Planning Board prior to 1st posting date of public notice for bylaw amendment, shall be governed by the provisions of the Town Zoning Bylaw in effect prior to the first publication of notice of the public hearing on this by-law required by MGL Chapter 40A, Section 5.

**Comment [KC5]:** Reasonable time frame to achieve a new solar bylaw – AG's office approved 10 months for this example.

**Comment [KC6]:** Or ZBA – dependent on which authority permits solar

**Comment [KC7]:** Consider permitting for these types of developments and list applications required for approvals.

**Comment [KC8]:** Or ZBA – dependent on which authority permits solar

# D TECHNICAL RECOMMENDATIONS FOR SAFE ENERGY STORAGE SYSTEMS

The recommendations below are pulled directly from Energy Storage Safety Guidelines compiled by the Energy Storage Integration Council for Distribution-Connected Systems in 2016. These guidelines are directed towards energy storage system suppliers, but may serve as a starting point for electrical inspectors or other safety personnel making inquiries about the safety of the system. The complete report is available at: https://www.epri.com/research/products/000000003002008308

- While it is often beneficial to design a closed system for heating and cooling efficiency, pressure relief valves could be considered to prevent a hazardous buildup of pressure. Closed systems can lead to oxygen starvation which can cause a backdraft if sufficient heat builds up for a fire. In systems where an explosion hazard may exist, deflagration venting could be considered as well.

- Fire suppression systems may be an effective control for component fire potential. Claims on effectiveness could be supported with some combination of testing, analysis, and/or simulation. However, it is important to consider the material that may experience a fire when selecting the type of system to be used. In the case of lithium-ion batteries, sufficient heat can be generated internally to sustain or reignite a fire if extinguished by an oxygen starvation system. In these cases a water suppression system may be considered if properly designed to remove enough heat from the cells that the exothermic chemical reaction can be slowed or stopped.

- It is important to consider both normal and unexpected operating conditions in the design of the contactors. Inverter based systems often require large capacitive filters on their DC bus to reduce the magnitude of the AC current (noise) component. These capacitors draw significant current when first connected to a battery or other DC source; thus, all inverters come with a pre-charge circuit. This circuit allows the input capacitors to be resistively coupled to battery voltage thereby reducing the in-rush current. Abnormal conditions during pre-charge include voltage spikes, incorrect contactor switching, and battery short circuit. If the contactors in this circuit open unexpectedly while pre-charging the capacitors, they can fuse and cause an inverter fault requiring extensive repair or, in rare cases, an inverter fire.

Impressed current systems or sacrificial anodes may be used in environments where corrosion could affect system operation or safety. Essentially, they work by holding the system at a somewhat positive potential to slow the rate of chemical reaction with this environment. Impressed current systems accomplish this through the use of a DC power supply or rectifier. Sacrificial anodes accomplish this by providing an anode of an appropriate chemical to produce a negative potential as it reacts with the air or soil.

- When an energy storage system contains large volumes of liquid, it is important to consider secondary containment. Recommendations can be adapted from stationary battery standards for flooded lead acid batteries which stipulate that secondary containment be sufficient to contain and allow for the safe disposal of either 30% of the total volume or 100% of the largest single container, whichever is greater.

- Cyber security may be considered as a safety issue for internet connected systems, SCADA connected systems, and even stand-alone systems. This involves an analysis of what access to system information and system control could produce a hazard. For example, changing BMS parameters could lead to reduced system life or fire through the improper enforcement of safety constraints. The National Institute of Standards and Technology publishes a general cyber security framework which may be applied to energy storage systems and installations.

- Energy storage technologies that contain or produce hydrogen gas are subject to the appropriate controls for this hazard. Examples of these controls can be found in section 500 of the National Electrical Code (NEC), and NFPA 2: Hydrogen Technologies Code those other standards may be more appropriate for specific technologies.

# E EXAMPLE TREE REPLACEMENT BYLAW/ORDINANCE

- City of Northampton

## § 350-12.3. Significant trees.

A. Legislative findings and intent. The City of Northampton finds that significant trees enhance air quality, reduce noise, reduce energy costs, create habitat, enhance aesthetics and property values, and benefit City neighborhoods. The intent of this section is to encourage the preservation and protection of significant trees during development and redevelopment projects that require a site plan approval, special permit, comprehensive permit, finding, or variance (collectively "zoning relief").

B. No person shall remove any significant tree associated with any site plan approval or any other zoning relief without a site plan approval from the Planning Board (if a site plan approval is otherwise required), or an administrative site plan approval from the Office of Planning and Sustainability if no site plan is otherwise required.

C. The removal of any significant tree after July 1, 2015, or within 12 months immediately prior to such a site plan or zoning relief, whichever is later, shall be subject to this section.

D. The requirements of this section shall not apply to:

(1) Trees located on property under the jurisdiction of the Conservation Commission.

(2) City-owned public shade trees pursuant to MGL Chapter 87.

(3) Trees associated with emergency projects necessary for public safety, health and welfare as determined by the Building Commissioner, Director of Planning and Sustainability, or Director of Public Works.

(4) Trees that are hazardous due to disease, age, or shallow roots, as determined and confirmed in writing by a certified arborist and reviewed by the City's Tree Warden.

(5) Trees affected by work performed by a utility company in maintenance of its rights-of-way or in its maintenance, repair or replacement of infrastructure that is unrelated to a development project requiring zoning relief.

(6) Trees that are approved for removal through special permit by the Planning Board.

(a) The Board may grant a special permit if, after weighing the benefits of significant trees against other community benefits created as part of the project, it determines a

waiver of tree replacement to be appropriate and if at least the following standards have been met:

[1] Trees are removed in order to create net zero energy buildings (for electric and thermal use) of up to 10,000 square feet and/or to install 10,000 square feet of ground-mounted PV panels; in addition to providing one or more community benefits, which may include:

[a] Affordable housing units where 50% or more of the units are deed-restricted for affordable housing as defined in this Chapter 350.

[b] A project that results in permanently protected open space.

(b) Building square footage shall apply to a single building footprint or to the aggregate of two or more buildings. In order to exercise a special permit granted under this section, applicants must present a building permit that has been issued for specific plans showing compliance with the net-zero standard and must construct in accordance with the special permit within one year of the issuance of a building permit. Planning Board special permit to grant a waiver from replacement within this provision is allowed only for the trees necessary to be removed in order to provide the solar access to the building(s) and/or panel array.

E. Any person removing a significant tree that is subject to this section shall satisfy either of the following conditions:

(1) Provide for replacement trees according to the following standards:

(a) Replacement trees shall be noninvasive deciduous or coniferous trees (as defined by the City's Tree List and Planting Guidelines) planted on or off site, as approved as part of a site plan or administrative site plan, or on any City-owned property with approval by the Office of Planning and Sustainability, in consultation with the City Tree Warden, unless such trees are public shade trees as per MGL c. 87, § 1,. Replacements shall be calculated so that for each inch of diameter at breast height of the removed trees there shall be no less than 1/2 inch of caliper diameter of replacement trees.

(b) Replacement trees shall have a minimum of one-inch caliper diameter.

(c) Replacement trees shall be maintained in good health a minimum of 24 months after they are planted as confirmed by the City's Tree Warden. If replacement trees are not found to be in "good health" as determined by the Tree Warden, the trees shall be replaced as directed by the Warden.

(d) Replacement trees shall either be approved street tree species as defined in the rules and regulations regarding subdivision of land or other trees that are hardy in all of the following USDA Plant Hardiness Zones: 6a, 6b, 7a, and 7b.

(2) Pay funds to the City for a tree replacement fund account that, in the Planning Board's estimate, will allow the City to plant new public shade trees on City property in accordance with the above formula.

F. Protection of significant trees during construction.

(1) Any significant trees to be retained and any replacement trees on property where demolition and/or construction activity is planned shall be protected in an area shown on the approved site plan and should follow American National Standards Institute (ANSI) A300 standards for tree care practices.

(2) The protected area shall exceed both the critical root zone and drip-line of each significant tree unless the Planning Board approves an alternate maintenance and tree protection plan submitted by a certified arborist.

(3) A certified arborist shall submit a written letter to the Building Commissioner, Tree Warden and Office of Planning and Sustainability certifying that such area has been so protected in accordance with the site plan.

G. Recordkeeping. The Department of Planning and Sustainability shall collect annual totals of the number and diameter at breast height measurements of significant trees preserved and replaced.

# F SAMPLE MUNICIPAL BYLAWS/ ORDINANCES

- Town of Belchertown
- City of Northampton
- Town of Shutesbury
- Town of Athol

**Belchertown Solar Bylaw**

**§145-28. Commercial Solar Photovoltaic Installations**

**A. Purpose.** This bylaw is to regulate the development of Commercial Solar Photovoltaic Installations by providing standards for their placement, design, construction, operation, monitoring, modifications, and removal; to protect public health, safety or welfare in accordance with M.G.L. c. 40A, § 3; to protect and preserve farmland, forests, and open space as promoted by the Commonwealth of Massachusetts; to protect the scenic, natural, and historic resources of Belchertown; and to provide adequate financial assurance for the eventual decommissioning of such installations.

A solar photovoltaic system that is for the exclusive purpose of providing electricity for a property that is primarily in agricultural use as defined under M.G.L. c. 40A, §3, and that produces electricity to be used solely for the benefit of the agricultural property is exempt.

**B. Applicability.** This bylaw applies to large-scale (minimum 250 kW rated nameplate capacity) solar photovoltaic installations constructed after the effective date of this bylaw. This bylaw also pertains to physical modifications that materially alter the type, configuration, or size of these installations or related equipment. The requirements of this bylaw shall apply to a commercial solar photovoltaic installation regardless of whether it is the primary use of property or an accessory use.

(1) As-of-Right: The following commercial solar photovoltaic installations, as defined herein, are allowed as of right with site plan approval in all zoning districts:

(a) Any such installation over parking lots;
(b) Any such installation on existing structures.

(2) Special Permit: Any CSPI not specified in (1) requires a special permit in all zoning districts from the Planning Board. For all special permit applications, site plan approval as described below is required, but shall not require a second public hearing, per §145-27D(3)(a).

(3) Not Permitted: No commercial solar photovoltaic installation may be permitted as follows:

(a) Any CSPI of greater than 20 acres in fenced array area.
(b) Any CSPI requiring forest clearing greater than ten acres.
(c) Any CSPI on slopes of 8% or greater as averaged over 50 horizontal feet; the Planning Board may consider waiving this up to 12% based on site-specific parameters.
(d) Any CSPI on a parcel with inadequate frontage as defined in §145-2.

**C. Definitions.**

**Commercial Solar Photovoltaic Installation (CSPI)**: Any solar photovoltaic installation with 250 kW or greater rated nameplate capacity, even if its primary generation is not intended for supplying the grid.

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

**Site Plan Approval Authority:** The site plan approval authority as designated by the Zoning Bylaw.

**Solar Photovoltaic Array:** an arrangement of solar photovoltaic panels.

**D. Requirements.**

**(1) Site Plan Approval.** The construction, installation or modification of a CSPI, whether as-of-right or by special permit, shall be subject to site plan approval in accordance with the Zoning Bylaw. Together with the requirements of §145-27, the Site Plan Approval Authority shall consider and apply the requirements set forth in this bylaw in reviewing and deciding an application for site plan approval.

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

(b) Required Documents. The project proponent shall provide the following documents:

[1] A site plan showing:

i. An existing conditions plan with property lines and physical features, including topography and roads, for the project site;
ii. Proposed changes to the landscape of the site, including grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures, driveways, snow storage, and storm water management systems;
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

[2] Documentation of actual or prospective access and control of the project site (item (2) below);

[3] An operation and maintenance plan (item (3) below);

[4] Proof of liability insurance; and

[5] Description of financial surety that satisfies Section 10(b);

[6] There shall be a fence surrounding the solar array and ancillary equipment.

The Site Plan Approval Authority may waive documentary requirements as it deems appropriate upon the written request of the applicant submitted with an application for approval.

**(2) Site Control.** The project proponent shall submit documentation of actual or committed prospective access and control of the project site sufficient to allow for construction and operation of the proposed CSPI.

**(3) Operation & Maintenance Plan.** The project proponent shall submit a plan for the operation and maintenance of the CSPI. This plan shall include measures to maintain safe access to the installation, storm water controls, and general procedures for operational maintenance of the installation. The development is subject to the Belchertown Stormwater bylaw and regulations.

**(4) Utility Notification.** No CSPI shall be constructed until evidence has been given to the Site Plan Approval Authority that the utility company operating the electrical grid the installation is to be connected to has been informed of the CSPI owner or operator's intent to install an interconnected customer-owned generator. Off-grid systems shall be exempt from this requirement.

**(5) Dimension and Density Requirements.**

**(a) Setbacks**

For all CSPI, front, side and rear yard setbacks shall be as follows:

[1] The front setback depth shall be at least 150 feet;

[2] The side setback depth shall be at least 75 feet;

[3] The rear setback depth shall be at least 75 feet;

[4] The setback from any developed residential property shall be at least 200 feet.

**(b) Appurtenant Structures.** All appurtenant structures to a CSPI shall be subject to the requirements of the Zoning Bylaw 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.

**(6) Design Standards.**

**(a) Lighting.** Lighting of CSPI shall be limited to night-time maintenance and inspections by authorized personnel, and shall comply with Dark Sky standards. There shall be no illumination without personnel on the site.

**(b) Signage.** A sign shall be erected identifying the owner and providing a 24-hour emergency contact phone number of the CSPI owner or operator. CSPIs shall not display any advertising. Any sign must comply with §145-22.

**(c) Day-time Visual Distraction.** The panel array shall be positioned to minimize glare on any residence or public way, and shall not create a visual obstruction on a public roadway, such as blocking intersections or creating blind curves.

**(d) Utility Connections.** Reasonable efforts shall be made to place all utility connections from the CSPI 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.

**(7) Safety and Environmental Standards.**

**(a) Emergency Services.** The CSPI owner or operator shall provide a copy of the project summary, electrical schematic, and an approved site plan, to the local fire department and the Building Inspector. Upon request the owner or operator shall cooperate with local emergency services in developing an emergency response plan, which may include ensuring that emergency personnel have immediate, 24-hour access to the facility. All means of shutting down the CSPI shall be clearly marked. The owner or operator shall identify a responsible person for public inquiries throughout the life of the installation, and shall provide a mailing address and 24-hour telephone number for such person(s).

**(b) Control of Vegetation and Animals, Including Insects.** Herbicides, rodenticides, or any other pesticides may not be used to control vegetation or animals at a CSPI. In a dual-use CSPI, the agricultural operator, but not the CSPI operator, is exempt from this restriction.

**(c) Project Visibility and Landscape Planting.** A CSPI shall be designed to minimize its visibility, including preserving natural vegetation to the maximum extent possible, blending in equipment with the surroundings, adding vegetative buffers to provide an effective visual barrier from adjacent roads and driveways, and to screen abutting dwellings. The owner of the CSPI shall not remove any naturally occurring vegetation

such as trees and shrubs unless it adversely affects the performance and operation of the solar installation. A diversity of plant species native to New England shall be used for any screens and vegetative erosion controls. Use of exotic plants, as identified by the most recent version of the "Massachusetts Prohibited Plant List" maintained by the Massachusetts Department of Agricultural Resources, is prohibited. If deemed necessary by the Planning Board, the depth of the vegetative screen shall be 30 feet and will be composed of native trees and shrubs staggered for height and density that shall be properly maintained. Cultivars of native plants are acceptable. The open area of the site shall be seeded with a pollinator mix and maintained as bird and insect habitat. Mowing is to be done as little as possible to retain a natural functioning of the landscape. Plants shall be maintained and replaced as necessary by the owner of the CSPI for the life of the CSPI.

**(d) Land Clearing, Soil Erosion, and Wildlife Habitat.** Clearing of natural vegetation shall be limited to what is necessary for the construction, operation, and maintenance of the CSPI or otherwise prescribed by applicable laws, regulations, and bylaws. A CSPI may not be constructed on slopes exceeding 8% except as expressly authorized pursuant to §145-28B(3)(c), nor may cutting and filling be done to reduce natural slopes. Existing root structures and topsoil shall be maintained to the maximum extent practicable and provide for a minimum of 6" of topsoil on all exposed areas.

**(8) Mitigation Measures.**

**(a) Mitigation for Loss of Carbon Sequestration and Forest Habitat.** If forestland is proposed to be converted to a CSPI, the plans shall designate an area of unprotected land (that is, land that could otherwise be developed under current zoning) on the parcel or block of contiguous parcels under common ownership that comprise the project site, and of a size equal to four times the total area of such forest conversion. Such designated land shall remain in substantially its natural condition without alteration except for routine forestry practices until such time as the CSPI is decommissioned and the site restored to forest. The special permit may be conditioned to effect and make enforceable this requirement.

**(b) Mitigation for Loss of Forest Habitat within the Installation.** If forestland is proposed to be converted to a CSPI, the plans shall show mitigation measures that create a wildflower meadow habitat within and immediately around the CSPI and a successional forest habitat in the surrounding areas managed to prevent shading until the installation is decommissioned and the site restored to forest. The special permit may be conditioned to effect and make enforceable this requirement.

**(9) Monitoring and Maintenance.**

**(a) Construction Monitoring.** The Site Plan Approval Authority may require a third-party inspector, selected by and acting under the direction of the Building

Commissioner, to be employed to monitor compliance with all approvals and conditions during the CSPI's construction at the applicant's expense.

**(b) Maintenance.** The CSPI 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 emergency services. The owner or operator shall be responsible for the cost of maintaining the solar photovoltaic installation and all access roads that are not public ways.

**(c) Annual Reporting.** The owner or operator of a CSPI shall submit an annual report demonstrating and certifying compliance with the Operation and Maintenance Plan, the requirements of this bylaw, and approvals granted hereunder, including but not limited to continued management and maintenance of vegetation, compliance with the approved plans and any permit conditions, continuation of liability insurance, and adequacy of road access. The annual report shall also provide information on the maintenance completed during the course of the year and the amount of electricity generated by the facility. The report shall be submitted to the Board of Selectmen, Planning Board, Fire Chief, Building Commissioner, Board of Health, and Conservation Commission (if a wetlands permit was issued) no later than 45 days after the end of the calendar year.

**(d) Modifications.** All material modifications to a CSPI made after issuance of the required building permit shall require approval by the Site Plan Approval Authority.

**(10) Discontinuance and Removal.**

**(a) Removal Requirements.** Any CSPI, or any substantial part thereof, not used for a period of one continuous year or more without written permission from the Site Plan Approval Authority, or that has reached the end of its useful life, shall be considered discontinued and shall be removed. Upon written request from the Building Inspector, addressed to the contact address provided and maintained by the owner or operator as required above, the owner or operator shall provide evidence to the Building Inspector demonstrating continued use of the CSPI. Failure to provide such evidence within thirty days of such written request shall be conclusive evidence that the installation has been discontinued. Anyone intending to decommission and/or remove such an installation shall notify the Site Plan Approval Authority and Building Inspector by certified mail of the proposed date of discontinued operations and plans for removal.

The owner or operator shall physically remove the installation no more than 150 days after the date of discontinued operations. Removal shall consist of:

[1] Physical removal of all parts of and appurtenances to the CSPI, including structures, equipment, security barriers and transmission lines;

[2] Disposal of all solid and hazardous waste in accordance with local, state, and federal waste disposal regulations;

[3] Stabilization or re-vegetation of the site as necessary to minimize erosion. The Site Plan Approval Authority may allow the owner or operator to leave landscaping or designated below-grade foundations in order to minimize erosion and disruption to vegetation.

[4] Any site that was deforested for the CSPI, per §145-28B(3)(b), shall be restored to encourage native tree growth, including the planting of seedlings, if necessary, to establish growth. The cost of plant replacement shall be incorporated into the financial surety stipulated in §145-28D(10)(b) below.

If the owner or operator of the CSPI fails to remove the installation in accordance with the requirements of this section, the town 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 facility is located. The Town may use the financial surety as stipulated in §145-28D(10) (b), below for this purpose.

**(b) Financial Surety**. Proponents seeking to construct and operate a CSPI shall provide to the Town, in a form determined by the Site Plan Approval Authority and prior to construction, a surety, through cash, an escrow account, bond or otherwise, to cover the cost of removal in the event the town must remove the CSPI and remediate the landscape, including reforestation. The amount and form of such surety shall be determined by the Site Plan Approval Authority. This surety will not be required for municipally- or state-owned facilities. 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.

| WATER SUPPLY PROTECTION (WSP) | | | | | | |
|---|---|---|---|---|---|---|
| **Uses Allowed: (by-right unless otherwise noted) any mix or their accessory uses/structures (home office, tag sales § 350-2.1, fences § 350-6.8, horses and animals § 350-5.3)** | **Site Plan Approval Required by Planning Board (if checked) Any nonresidential construction greater than 2,000 square feet triggers site plan** | **Use By Special Permit Approval Required by Designated Board (if checked)** | **Dimensions** | **Landscaping** | **Minimum Parking** | **Building Design** |
| Solar photovoltaic of any size, ground-mounted:<br>1. Over any legal parking lot or driveway;<br>2. At any landfill site not separate from the site-assigned property by any road; and<br>3. At an airport not separated from the runways by any road. | √ | | Same setbacks as setbacks for other accessory buildings in the district | Sufficient landscaping within the setbacks to provide effective visual separation | 0 | None. Installations must be maintained in good condition with painting, structural repairs and security maintained and facilities no longer being used dismantled within 90 days. |
| Accessory solar photovoltaic ground-mounted on a parcel with any building or use, provided that the PV is sized to generate no more than 100% or 8 KW of the annual projected electric use of the non-PV building or use | | | Setbacks:<br>Front = 15 feet<br>Side = 4 feet<br>Rear = 4 feet<br><br>And such open space as applies to the principal building | | | |
| Accessory solar photovoltaic ground-mounted on a parcel with any building or use, between 8 KW or over 100% up to but no more than 200% of the annual projected electric use of the non-PV building or use | √ | √ Planning Board | Setbacks:<br>Front = 15 feet<br>Side = 4 feet<br>Rear = 4 feet<br><br>And such open space as applies to the principal building | | | |

| WATER SUPPLY PROTECTION (WSP) | | | | | | |
|---|---|---|---|---|---|---|
| **Uses Allowed: (by-right unless otherwise noted) any mix or their accessory uses/structures (home office, tag sales § 350-2.1, fences § 350-6.8, horses and animals § 350-5.3)** | **Site Plan Approval Required by Planning Board (if checked) Any nonresidential construction greater than 2,000 square feet triggers site plan** | **Use By Special Permit Approval Required by Designated Board (if checked)** | **Dimensions** | **Landscaping** | **Minimum Parking** | **Building Design** |
| Solar photovoltaic (PV), large-scale ground-mounted with less than two acres of tree removal: Any other solar photovoltaic (PV), large-scale ground-mounted not listed above, where less than two acres of tree removal is planned. The removal of significant trees on the subject parcel(s) must be replaced in accordance with § 350-12. 3 and includes tree removal that occurs within 12 months immediately prior to an application for installation of such a system.[1] | √ | | Lot size = 0<br><br>Frontage/Width/Depth = 0<br><br>Setbacks:<br>Front: 50 feet<br>Side: 50 feet<br>Rear: 50 feet<br><br>Maximum height = 30 feet<br><br>Open space = 20% | A planted buffer to abutting residential property shall be at least 15 feet in width along the property boundary. It shall contain a screen of plantings of vertical habit in the center of the strip not less than three feet in width and six feet in height at the time of occupancy of such lot. Individual shrubs shall be planted not more than five feet on center, and individual trees thereafter shall be maintained by the owner or occupants so as to maintain a dense screen year-round. At least 50% of the plantings shall be evenly spaced. Whenever possible, existing trees and ground cover should be preserved in this strip, reducing the need to plant additional trees. Trees may not be cut down in this strip without site plan approval. | 0<br><br>See also §§ 350-8.2 through 350-8.11 for location, construction, layout requirements for parking lots | Installation must be maintained in good condition with painting, structural repairs and security maintained and facilities no longer being used dismantled within 90 days. |

| WATER SUPPLY PROTECTION (WSP) | | | | | | |
|---|---|---|---|---|---|---|
| **Uses Allowed: (by-right unless otherwise noted) any mix or their accessory uses/structures (home office, tag sales § 350-2.1, fences § 350-6.8, horses and animals § 350-5.3)** | **Site Plan Approval Required by Planning Board (if checked) Any nonresidential construction greater than 2,000 square feet triggers site plan** | **Use By Special Permit Approval Required by Designated Board (if checked)** | **Dimensions** | **Landscaping** | **Minimum Parking** | **Building Design** |
| Solar photovoltaic (PV), large-scale ground-mounted with more than two acres of tree removal[1,2] | √ | √ Planning Board | Lot size = 0<br><br>Frontage/Width/Depth = 0<br><br>Setbacks:<br>Front: 50 feet<br>Side: 50 feet<br>Rear: 50 feet<br><br>Maximum height = 30 feet<br><br>Open space = 20% | A planted buffer to abutting residential property shall be at least 15 feet in width along the property boundary. It shall contain a screen of plantings of vertical habit in the center of the strip not less than three feet in width and six feet in height at the time of occupancy of such lot. Individual shrubs shall be planted not more than five feet on center, and individual trees thereafter shall be maintained by the owner or occupants so as to maintain a dense screen year-round. At least 50% of the plantings shall be evenly spaced. Whenever possible, existing trees and ground cover should be preserved in this strip, reducing the need to plant additional trees. Trees may not be cut down in this strip without site plan approval. | 0<br><br>See also §§ 350-8.2 through 350-8.11 for location, construction, layout requirements for parking lots | Installation must be maintained in good condition with painting, structural repairs and security maintained and facilities no longer being used dismantled within 90 days. |

| WATER SUPPLY PROTECTION (WSP) | | | | | | |
|---|---|---|---|---|---|---|
| **Uses Allowed: (by-right unless otherwise noted) any mix or their accessory uses/structures (home office, tag sales § 350-2.1, fences § 350-6.8, horses and animals § 350-5.3)** | **Site Plan Approval Required by Planning Board (if checked) Any nonresidential construction greater than 2,000 square feet triggers site plan** | **Use By Special Permit Approval Required by Designated Board (if checked)** | **Dimensions** | **Landscaping** | **Minimum Parking** | **Building Design** |
| Short-term rental: allowed only upon annual registration with the City. Use as a registered rental is only valid for the year in which registration is completed and expires December 31 each year. | | | | | | |

NOTES:

[1] The owner or operator shall remove the installation no more than 150 days after the date of discontinued operations. Removal shall consist of:

a. Removal of all structures, equipment, security barriers, transmission lines, conduits, poles.
b. Disposal of all waste in accordance with local, state, and federal waste disposal regulations.
c. Stabilization or re-vegetation of the site as necessary to minimize erosion.

If the owner/operator fails to remove the installation in accordance with the requirements of this section, the City shall have the right, exercise or call the bond/performance guarantee in order to cover the cost of removal.

Performance guarantee: Applicants shall submit an itemized cost estimate for complete decommissioning of the array as specified above. Prior to beginning construction the applicant shall post a performance guarantee in the form of a bond or escrow or other guarantee approved by the Planning Board for the amount to cover decommissioning, including a 20% contingency and calculated with twenty-year inflation factor.

[2] The Board must find that the removal of trees will not negatively impact the health, safety and welfare of the residents of Northampton by maintaining a robust and diverse ecosystem for the residents while also creating renewable energy systems. In order for the Board to make such finding, the applicant shall submit an analysis of the proposed project's impact relative to the benefit of the solar installation as follows:

1. Analysis showing that tree removal which occurs on more than one acre of slopes greater than 20% will not cause erosion of topsoil and will not increase siltation of any streams present on the site or within 200 feet of the property boundary.
2. Analysis of the forest type and relevant habitat that will be lost. This analysis must include the structure and diversity of the canopy, midstory and understory of the forested area to be cleared. Analysis must be performed by an individual with a master's degree in wildlife biology or ecological science from an accredited college/university or other competent professional with at least two years of experience in wildlife habitat evaluation.
   a. Any forested area within which certifiable vernal pools are found must be identified and a permit from the Conservation Commission must be granted prior to review by the Planning Board.
   b. Any forested area containing clusters of five or more healthy trees of 20 inches diameter breast height or greater that are not in decline shall be preserved in order to continue to provide high value ecological benefit to the community. Connection of these larger trees to surrounding stands of trees shall be maintained.
   c. As part of the forest type analysis, the report shall contain information regarding the abundance and distribution of habitats within the region and of the specific site and any historical information on the extent and quality of these habitats and impact of clearing on these habitats. The applicant must show through analysis that habitat is not fragmented and that connectivity remains in the proposed conditions.
3. Analysis by a qualified third party showing that the project will be carbon-neutral over the first 10 years of operation. The applicant shall provide the following calculations:
   a. The total volume of trees to be removed (provided by an independent certified forester) and the projected volume of trees over a ten-year period of additional growth.
   b. Subtracting the estimated live-wood in replacement trees provided under the significant tree section of this zoning ordinance 10 years after planting.
   c. Conversion of the net live-wood to be removed to short tons of carbon (using research from the Northern Institute of Applied Climate Science or other methodology after approval by the permit granting authority).
   d. Subtraction of the carbon offsets (short tons of carbon) provided by the solar photovoltaic project over 10 years of operation, including the calculation of potential carbon stored had the trees continued to thrive in that same ten-year window.

e. If there is any net release of carbon with the above calculations, the applicant shall assign renewable energy credits (REC) to the City to match or exceed said release of carbon. However, RECs may not be used to fund biomass projects.

4. At least 50% of the property shall be protected from tree clearing and future development for the duration of the operation of the solar array installation and until such time as the system is decommissioned and removed.
5. Within the area beyond the first two acres of canopy removed, stumps for removed trees must remain in place and no excavation/soil disturbance is allowed other than what would be required to bore support posts for the PV panels.
6. Electrical transformers for utility interconnections may be aboveground only if required by the utility provider. Power and telecommunications poles and equipment shall not be visible from the public way.

# Town of Shutesbury

**8.10-1 Purpose**

The purpose of this bylaw is to facilitate and appropriately regulate the creation of Ground-Mounted Solar Electric Installations (a) by providing standards for the placement, design, construction, operation, monitoring, modification and removal of such installations that address public safety, minimize impacts on environmental, scenic, natural, and historic resources and (b) to provide adequate financial assurance for the eventual decommissioning of such installations.

**8.10-2 Applicability**

A.! This Section 8.10 applies to Large- Scale and Small-Scale Ground-Mounted Solar Electric Installations, as noted. Small-Scale Ground-Mounted Solar Electric Installations which are accessory to an existing residential or non-residential use which generate electricity principally used by such residential or non-residential use are permitted as of right, do not need to comply with this Section, but require a Site Plan Review from the Zoning Board of Appeals, as well as a building permit, and must comply with all other applicable

provisions of the Town of Shutesbury Zoning Bylaw.

B. This Section 8.10 also pertains to physical modifications that materially alter the type, configuration, or size of Ground-Mounted Solar Electric Installations or related equipment.

C. This Section 8.10 shall not apply to any special permit duly applied for and in process prior to its effective date.

D. Upon written request by the applicant, the Planning Board may waive or reduce any requirement of this Section 8.10 by the same majority vote required for the permit itself upon written findings included in the permit of:
   1. special circumstances of the site, its surroundings, or the proposal that negate the need for imposition of the requirement; or the objectives of this section may be met in an alternative manner; and
   2. that such a waiver or reduction will not derogate from the public purposes and intent of this zoning bylaw.

   In the case of a special permit, 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 permit sought.

**8.10-3 General Requirements**

A. Compliance with Laws, Bylaws, and Regulations
   The construction and operation of all Ground-Mounted Solar Electric 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 thereof shall be constructed in accordance with the Massachusetts State Building Code.

B. Mitigation for Loss of Carbon Sequestration and Forest Habitat
   If forestland is proposed to be converted to a Ground-Mounted Solar Installation the plans shall designate thereon an area of unprotected (meaning, not subject to MGL. Ch. 184, §s 31-33 at time of application) land on the same lot and of a size equal to four times (4X) the total area of such installation. Such designated land shall remain in substantially its natural condition without alteration, including unauthorized (by SPGA) forestry/tree cutting, until such time as the installation is decommissioned. The Special Permit may be conditioned to effectuate and make enforceable this requirement.

C. Mitigation for Loss of Forest Habitat within the Installation
   If forestland is proposed to be converted to a Ground-Mounted Solar Electric Installation the plans shall show mitigation measures that create a wildflower meadow habitat within and immediately around the Solar Electric System and a successional forest habitat in the surrounding areas managed to prevent shading until such time as the installation is decommissioned. The Special Permit may be conditioned to effectuate and make enforceable this requirement.

D. Mitigation for Installation of Perimeter Fencing
   Any perimeter fencing within winter sight of a public roadway, driveway, or dwelling existing at the time of the special permit application shall be entirely black in color. The Special Permit may be conditioned to effectuate and make enforceable this requirement.

E. Mitigation for Disruption of Trail Networks
If existing trail networks or woods roads are disrupted by the location of the Ground-Mounted Solar Electric Installation, the plans shall show alternative trail alignments to be constructed by the applicant. The Special Permit may be conditioned to effectuate and make enforceable this requirement, although no rights of public access may be established hereunder.

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

**8.10-4 Required Documents**

The project applicant shall provide the following documents in addition to or in coordination with those required under Article IX below.

A. Site Plan. A Site Plan additionally showing:
   1. Locations of wetlands and Priority Habitat Areas as defined by the Natural Heritage & Endangered Species Program (NHESP).
   2. Locations of local or National Historic Districts.
   3. Locations of all known, mapped or suspected Native American archaeological sites or sites of Native American ceremonial activity. Identification of such sites shall be based on responses, if any, to written inquiries with a requirement to respond within 35 days, to the following parties: all federally or state recognized Tribal Historic Preservation Officers with any cultural or land affiliation to the Shutesbury area; the Massachusetts State Historical Preservation Officer; tribes or associations of tribes not recognized by the federal or state government with any cultural or land affiliation to the Shutesbury area; and the Shutesbury Historical Commission. Such inquiries shall serve as a notice to the aforesaid parties and shall contain a plan of the project, specific identification of the location of the project, and a statement that permitting for the project is forthcoming. Accompanying the site plan shall be a report documenting such inquiries, the responses from the parties, a description of the characteristics, including photographs, of any Native American sites located, and the outcomes of any additional inquires made based on information obtained from or recommendations made by the aforesaid parties. A failure of parties to respond within 35 days shall allow the applicant to submit the site plans.
   4. The project proponent must submit a full report of all materials to be used, including but not limited to the use of cleaning products, paints or coatings, hydro-seeding, fertilizers, and soil additives. When available, Material Safety Data Sheets will be provided.

B. Blueprints. Blueprints or drawings of the installation signed by a Professional Engineer licensed to practice in the Commonwealth of Massachusetts, showing:
   1. The proposed layout of the system and any potential shading from nearby structures.
   2. One- or three-line electrical diagram detailing the Ground-Mounted Solar Electric Installation, associated components, and electrical interconnection methods, with all Massachusetts and National Electrical Code compliant disconnects and overcurrent devices.

C. General Documentation. The following information shall also be provided:
   1. A list of any hazardous materials proposed to be located on the site in excess of

household quantities and a plan to prevent their release to the environment as appropriate.
2. Name, address, and contact information for proposed system installer.
3. The name, contact information and signature of any agents representing the project applicant.

D. Site Control
The project applicant shall submit documentation of actual or prospective access and control of the project site sufficient to allow for construction and operation of the proposed Ground-Mounted Solar Electric Installation.

E. Operation and Maintenance Plan
The project applicant shall submit a plan for the operation and maintenance of the Ground-Mounted Solar Electric Installation, which shall include measures for maintaining safe access to the installation, stormwater management (consistent with DEP's and, where appropriate, Shutesbury's stormwater regulations and vegetation controls), as well as general procedures for operational maintenance of the installation.

F. Financial Surety
Applicants for Ground-Mounted Solar Electric Installations shall provide a form of surety, either through an escrow account, bond or otherwise, accessible to the Town of Shutesbury. to cover the cost of removal in the event the Town must remove the installation and remediate the site to its natural preexisting condition, in an amount and form determined to be reasonable by the SPGA, but in no event to exceed more than 125 percent of the cost of removal and compliance with the additional requirements set forth herein. The project applicant 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.

G. Utility Notification
No Ground-Mounted Solar Electric Installation shall be constructed until evidence has been provided to the Planning Board that the utility company that operates the electrical grid where the installation is to be located has approved the solar electric installation owner or operator's intent to install an interconnected customer-owned generator and that the utility can and will connect the proposed generator into their power grid. Off-grid systems shall be exempt from this requirement.

H. Proof of Liability Insurance

**8.10-5 Dimensional Requirements**

A. Minimum setbacks for all Large-Scale Ground-Mounted Solar Electric Installations:
Front street setback: 500 feet (as required for Forest Conservation District)
Property line setback: 100 feet

B. Minimum setbacks for all Small-Scale Ground-Mounted Solar Electric Installations:
Front street setback: 100 feet
Property line setback: 50 feet

C. Required setback areas shall not be counted toward a facility's total acreage.

**8.10-6 Design and Performance Standards**

A. Lighting

Large- and Small-Scale Solar Electric Installations shall have no permanently-affixed exterior lighting.

B. Signage
   1. Sufficient signage shall be provided to identify the owner of the facility and provide a 24-hour emergency contact phone number.
   2. Signage at the perimeter warning pedestrians is allowable.
   3. Ground-Mounted Solar Electric Installations shall not be used for displaying any advertising except for reasonable identification of the manufacturer or operator of such installation.

C. Control of Vegetation
   Herbicides or pesticides may not be used to control vegetation or animals at a Ground-Mounted Solar Electric Installation.

D. Visual Impacts
   1. Ground-Mounted Solar Electric Installation shall be designed to minimize visual impacts including preserving natural vegetation to the maximum extent possible, blending in equipment with the surroundings, and adding vegetative buffers to provide an effective visual barrier from adjacent roads and driveways, and to screen abutting residential dwellings.
   2. When possible, a diversity of plant species shall be used, with a preference for species native to New England.
   3. Use of exotic plants, as identified by the most recent copy of the "Massachusetts Prohibited Plant List" maintained by the Massachusetts Department of Agricultural Resources, is prohibited.
   4. If deemed necessary by the Planning Board, the depth of the vegetative screen shall be 30 feet and will be composed of native trees and shrubs staggered for height and density that shall be properly maintained.
   5. The owner/operator shall not remove any naturally occurring vegetation such as trees and shrubs unless it adversely affects the performance and operation of the solar installation.
   6. Landscaping shall be maintained and replaced as necessary by the owner/operator of the Ground-Mounted Solar Electric Installation.

E. Utility Connections.
   Electrical transformers, wires, or other utility interconnections shall be constructed as required by the utility provider and may be above ground if necessary; provided, however, that every reasonable effort shall be made to place all utility connections underground, depending on appropriate soil conditions and topography of the site and any requirements of the utility provider.

F. All electric power generated at a Ground-Mounted Solar Electric Installation shall be from Solar Energy.

G. Access Driveways shall be constructed to minimize grading, removal of stone walls or roadside trees, and minimize impacts to environmental or historic resources.

**8.10-7 Safety and Environmental Standards**

A. Emergency Services
   1. Ground-Mounted Solar Electric Installations owner or operator shall provide a copy of

the project summary, electrical schematic, and site plan to the Shutesbury Fire Chief.
2. The owner or operator shall cooperate with local emergency services to develop an emergency response plan.
3. All means of shutting down the solar electric installation shall be clearly marked.
4. The owner or operator shall identify a responsible person for public inquiries throughout the life of the installation.

B. Land Clearing, Soil Erosion and Land Impacts
1. The facility shall be designed to minimize impacts to open agricultural land and fields, even if not in production. Clearing of natural vegetation shall be limited to what is necessary for the construction, operation and maintenance of the Ground-Mounted Solar Electric Installation. In no event shall tree stocking on the parcel to be developed for the installation be reduced to below Level-C as defined in 304 CMR 11.03 and as measured at the time of application. Grading that substantially disturbs the existing soil profile and structure is prohibited; sites shall be selected where construction may be accomplished without such earth work.
2. Prior to any site disturbance and construction, the limits of the work shown on the approved site plan shall be surveyed and clearly marked by a Professional Land Surveyor. Upon completion of the survey, the Professional Land Surveyor shall verify to the Planning Board, in writing, that the limit of work, as shown on the approved site plans, has been established on site.
3. The design shall minimize the use of concrete and other impervious materials to the maximum extent possible. Ground-Mounted Solar Electric Installation shall be installed on water permeable surfaces.
4. Locating Ground-Mounted Solar Electric Installations, including access driveways and any associated drainage infrastructure on original grades in excess of 15% is prohibited.

C. Habitat Impacts
Large-Scale Ground-Mounted Solar Electric Installations shall not be located on permanently protected land subject to MGL. Ch. 184, §s 31-33 Priority Habitat and Bio Map 2 Critical Natural Landscape Core Habitat mapped by the Natural Heritage and Endangered Species Program (NHESP) and "Important Wildlife Habitat" mapped by the DEP.

D. Wetlands
1. Where wetland delineation is in doubt or dispute, the Planning Board may require the applicant to submit a request for determination of wetlands to the Conservation Commission.
2. The Planning Board may impose conditions to contain and control stormwater runoff that might negatively impact identified wetlands or other hydrologic features even if the proposed work area is outside the jurisdiction of the Conservation Commission.

**8.10-8 Monitoring, Maintenance and Reporting**

A. Solar Electric Installation Conditions
1. The Ground-Mounted Solar Electric Installation owner or operator shall maintain the facility in good condition.
2. Maintenance shall include, but not be limited to, painting, structural repairs, and

integrity of security measures.

3. Site access shall be maintained to a level acceptable to the Shutesbury Fire Chief and Emergency Management Director.
4. The owner or operator shall be responsible for the cost of maintaining the Solar Electric Installation and any access driveways.

B. Annual Reporting
1. The owner or operator of a Ground-Mounted Solar Electric Installation shall submit an annual report demonstrating and certifying compliance with the Operation and Maintenance Plan, the requirements of this Section 8.9 and the approved special permit, including but not limited to continued management and maintenance of vegetation, compliance with the approved plans and any special permit conditions, continuation of liability insurance, and adequacy of road access.
2. The annual report shall also provide information on the maintenance completed during the course of the year and the amount of electricity generated by the facility.
3. The report shall be submitted to the Select Board, Planning Board, Fire Chief, Emergency Management Director, Building Commissioner, Board of Health and Conservation Commission (if a wetlands permit was issued) no later than 45 days after the end of the calendar year.

**8.10-9 Abandonment or Decommissioning**

A. Removal Requirements
1. Any Ground-Mounted Solar Electric Installation which has reached the end of its useful life or has been abandoned shall be removed.
2. The owner or operator shall physically remove the installation no later than 150 days after the date of discontinued operations.
3. The owner or operator shall notify the Special Permit Granting Authority by certified mail, of the proposed date of discontinued operations and plans for removal.

B. Decommissioning shall consist of:
1. Physical removal of all components of the Ground-Mounted Solar Electric Installation, including but not limited to structures, foundations, equipment, security barriers, and on-site above-ground transmission lines. Associated off-site utility interconnections shall also be removed if no longer needed.
2. Disposal of all solid and hazardous waste in accordance with local, state, and federal waste disposal regulations.
3. Restoration of the site to its natural preexisting condition, including stabilization or re-vegetation of the site as necessary to minimize erosion. The Special Permit Granting Authority may allow the owner or operator to leave landscaping or designated below-grade foundations and electric lines in order to minimize erosion and disruption to vegetation.

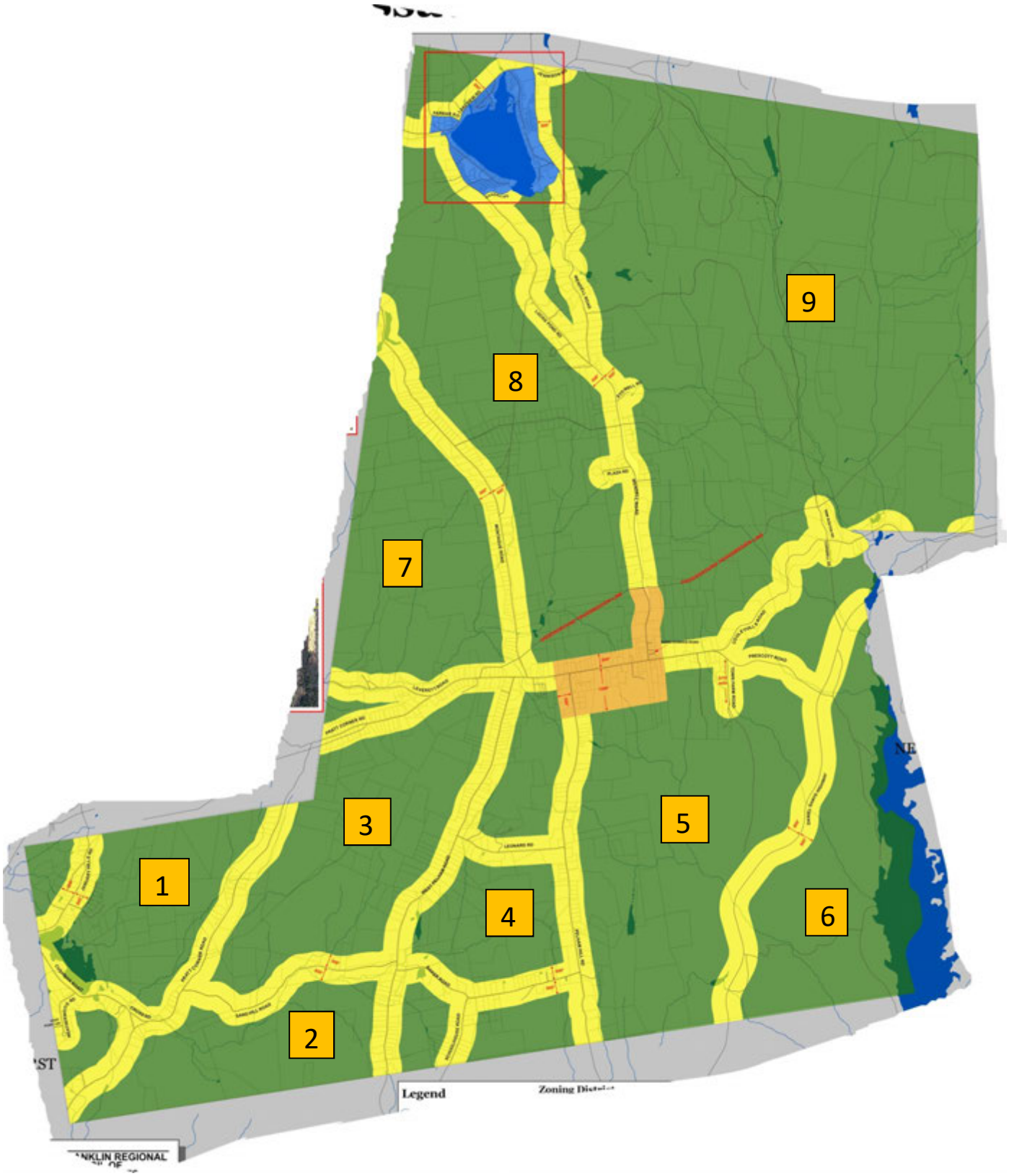
C. Decommissioning by the Town
If the owner or operator of a Ground-Mounted Solar Electric Installation fails to remove such installation in accordance with the requirements of this Section 8.9 within 150 days of discontinued operations or abandonment, the Town may enter the property and physically remove the installation at the owner's expense, drawing from the escrow account or upon the bond or other financial surety provided by the applicant.

**8.10-10 Lapse of Approval**

Any special permit shall automatically lapse if the Large-or Small-Scale Ground-Mounted Solar Electric Installation is not installed and functioning within two (2) years of the grant of the special permit or if the installation shall be considered abandoned.

**MAP: LARGE GROUND MOUNTED SOLAR ELECTRIC INSTALLATION DISTRICTS**

**As referenced in Shutesbury Zoning Bylaws, Section 8.10**



**Article ___** To see if the Town of Athol will vote to amend the Athol Zoning Bylaws, Article III, by deleting the existing Section 3.24, Ground-Mounted Solar Photovoltaic Installations, in its entirely and replacing with the following new text in its place.

The purpose and intent of this bylaw is to provide standards for the placement, design, construction, operation, monitoring, modification and removal of ground-mounted solar photovoltaic installations which 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 placement, design, construction, operation, maintenance and/or repair, and environmental effects of ground-mounted solar photovoltaic installations.

3.24.2 Applicability

This bylaw applies to commercial and residential ground-mounted solar photovoltaic installations greater than 10,000 square feet proposed to be constructed after the effective date of this bylaw. This bylaw also pertains to physical modifications that materially alter the type, configuration or size of the installation. Square footage shall be calculated as follows:

i. The area within the security fence if a fence is provided, or
ii. All land area within a polygon (a plane shape-two dimensional-with straight sides) around the entire installation including all solar panels, all appurtenances including but not limited to buildings, storage areas, construction staging and lay-down areas, and transformers and poles, and parking along with a 15 foot perimeter area around all of the above or
iii. All areas of disturbed land, whichever is greater.

As defined in 3.24.2:

a) This bylaw does not pertain to ground-mounted solar photovoltaic installations installed on residential, commercial or industrial buildings. Those installations are subject to the State Building Code.
b) Ground-mounted solar photovoltaic installations less than or equal to 10,000 square feet shall only need a building permit and meet property setback requirements.
c) This bylaw does not pertain to solar carport canopies over existing rows of parking spaces. Such installations are considered Accessory Uses under Section 2.3 and are subject to the State Building Code.
d) This bylaw shall not apply to any ground-mounted solar photovoltaic installation being developed with the direct involvement of the Town of Athol at the former municipal landfill on West Royalston Road in Athol, MA.

3.24.3 Special Permit Granting Authority

Subject to the requirements of this bylaw, ground-mounted solar photovoltaic installations may be permitted in the R-C Zoning District subject to a Special Permit from the Athol Board of Planning and Community Development, pursuant to meeting the Special Permit Criteria and Requirements below. The Board of Planning and Community Development shall be the Special Permit Granting Authority for ground-mounted solar photovoltaic installations. In addition to the findings required in Section 1.2.6.2, the Special Permit Granting Authority must also find that the proposal does not contravene the purposes of this section. Ground-mounted solar photovoltaic installation Special Permit applications shall be filed in accordance with the Board of Planning and Community Development Filing Requirements & Fees.

3.24.4 Requirements for Ground-Mounted Solar Photovoltaic installations

The following requirements shall apply to ground mounted solar photovoltaic installations greater than 10,000 square feet.

1. Compliance with Laws, Bylaws and Regulations

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

2. Building Permit

No ground-mounted solar photovoltaic installation shall be constructed, installed or modified as provided in this section without first obtaining a building permit

3. Pre-application Conference and Public Outreach

The applicant shall participate in a pre-application conference with the Board of Planning and Community Development prior to the submittal of a formal application. A public outreach plan, including project development timeline, which indicates how the applicant will meet the required site plan review notification procedures and otherwise inform the abutters and the town residents, shall be provided as part of the pre-application conference process. The applicant shall be required to erect a 4-foot by 4-foot double-sided sign perpendicular to the road at the proposed entrance to the project site prior to the pre-application conference.

The sign shall be headed with the following: Notice: This property is the site of a proposed commercial ground-mounted solar photovoltaic installation in accordance with Section 3.24 of the Athol Zoning Bylaw. The sign shall also indicate the name of the applicant, the name of the owner of the installation, the size of the proposed facility in both acreage and MW, a contact person for additional information including phone and email address, and assessors plot number for the property.

4. Site Plan Review

Ground-mounted solar photovoltaic installations greater than 10,000 square feet shall undergo site plan review by the Board of Planning and Community Development (BPCD) prior to construction, installation or modification as provided in this section as well as section 3.18, Site Plan Review, as

applicable. The BPCD shall act as the Special Permit Granting Authority for such site plans with the entirety of the Town of Athol, including the Major Commercial Overlay District.

3.24.4.5 Professional Engineer

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

3.24.4.6 Required Documents to be deemed a complete application.

Pursuant to the site plan review process, the applicant shall also provide the following documents:

(a) A site plan showing:

i. Property lines and physical features, including both existing and proposed roads, for the project site at a scale of 1 inch equals 40 feet or such scale as may be approved by the Special Permit Granting Authority on standard 24" by 36" sheets and continuation on 8.5 " by 11" sheets as necessary for narrative;
ii. Blueprints or drawings of the solar photovoltaic installation showing the proposed layout of the system;
iii. 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;
iv. Proposed wattage of the solar photovoltaic installation solar power generation indicated in both dc (direct current) and ac (alternating current); a notation shall be included explaining the difference, e.g. loss in conversion from dc to ac;
v. Technical specification of the major system components to be used, including the PV panels, mounting system, and inverter and battery storage;
vi. Name, address, and contact information for proposed system installer (owner);
vii. Name, address, phone number and signature of the applicant, as well as all co-proponents or property owners;
viii. Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures;
ix. All existing lot lines, with size of each existing lot in acres or square feet, abutting land uses and location of structures
x. Names and addresses of all record owners within 500 hundred feet of all property lines along with a map showing the same;
xi. Locations and details of all security measures for the site;
xii. as identified on the United States Natural Resources Conservation Service soils survey, on all land involved with the project;
xiii. ;
xiv. ;
xv. All storm water plans as required in Section 3.24.5.11;
xvi. A ;
xvii. A buffer, screening and landscape plan as required in Section 3.24.3;
xviii. at the time of application filing.
xix. as well as documentation of Dark Sky Standards in accordance with Section 3.24.5.7;

xx. Location of equipment and construction staging area, and

(b) The name, contact information and signature of any agents representing the applicant;

(c) and proposed mitigation, if any, to minimize the impact on affected properties and roads, as well as the Orange airport in regards to the proposed solar panels as required in Section 3.24.5.5;

(d)

(e) Documentation by an acoustical engineer of the noise levels projected to be generated by both the installation and operation of the facilities as required in Section 3.24.5.13;

(f) Documentation of all soils types, as identified on the United States Natural Resources Conservation Service soils survey, on all land involved with the project;

(g) Documentation of actual or prospective access and control of the project site as required in Section 3.24.7;

(h) Visual impact analysis as required in Section 3.24.5.5;

(i)

(j)

(k) Mitigation Plan as required in Section 3.24.5.4;

(l) A list identifying all off-site electrical system improvements necessary to the electrical grid to accommodate the power from the proposed installation and identification of what entity is paying for such improvements.

3.24.4.7 Waiver of Submittal Requirements: Upon the written request of the applicant with justification, the Special Permit Granting Authority may waive any of its submission requirements under unique site conditions. In addition, the Special Permit Granting Authority may request any additional data needed to render its decision.

3.24.5 Design Standards

1. Lot and Siting Requirements

i. Ground-mounted commercial solar photovoltaic array installations shall be permitted on parcels larger than 10 acres located within the RC zoning district and shall have a minimum lot frontage of 160 feet.

ii. Project generation size shall not exceed 5MW AC, nor shall the installation exceed 20 acres of fenced area, if fenced. If not fenced, the 20 acre area shall be calculated as the area within a polygon around the entire installation including all solar arrays, all appurtenances including but not limited to buildings, storage areas, construction staging and lay-down areas, transformers and poles along with a 15 foot perimeter area around all of the above

a. [redacted] (measured over 100-foot intervals.) Cutting and filling to reduce natural slopes shall be prohibited except on short hollows, depressions or high spots. A waiver to increase the slope from 10% to 12% may be requested.

b. Shall be located on any parcel that contains 50% of Priority Habitat, Core Habitat or Critical Natural Landscape as defined in 225 CMR 20.00 Solar Massachusetts Renewable Target (SMART) Program, nor shall any trees be removed, or construction of structures, access roads or transmission lines may be placed in these designated areas.

iv. [redacted]

v. Location of the entrance road and all utility poles shall be located within the lot's frontage taking into consideration site lines for vehicular traffic and to lessen any visual impacts on abutters.

2. [redacted]

i. For all zoning districts except for the Rural Single-Family Residential (RC) zoning district, ground-mounted solar photovoltaic installations must observe all yard requirements applicable to the principal structure as defined in Section 2.6, Intensity of Use Schedule. The Special Permit Granting Authority may increase these setbacks in these districts if they determine it to be appropriate.

ii. For the RC zone, setbacks shall be:

- 200 feet for front yard*
- 200 feet for side and rear yard*
- 200 feet from any perennial stream**
- 200 feet from any water body greater than 1 acre and less than 5 acres**
- 400 feet from the shoreline of any water body greater than 5 acres**

* The Special Permit Granting Authority may reduce the minimum setback distance for front, side and rear yards only in the RC District to a minimum of 75 feet as authorized per Section 3.24.17. In addition to the specifics of Section 3.24.17, the applicant shall also be required to submit written consent from all affected abutter(s) for any reduction in setbacks.

However, reduction of the setback on any frontage with a public road is not permitted whether the yard is a front, side or rear yard. The setback between properties of a single owner subdivided per Section 3.24.5.4.4 may be waived to no less than the minimum for existing setback requirements of the RC District per Section 2.6.

**The setbacks for perennial streams and water bodies between 1 and 5 acres are not subject to any waiver of distances under Section 3.24.13. Setbacks for water bodies greater than 5 acres are only allowed to be reduced through a waiver to a minimum distance of 300 feet as long as a natural wooded buffer is maintained, detailed stormwater plans show no further impact to abutting properties versus the 400-foot setback distance, water quality of runoff is not reduced and wildlife and fauna movement is not restricted with the reduced setback. No access roads or transmission lines may be constructed in the setbacks to any water body greater than 1 acre.

All ground mounted photovoltaic panels in a residential zone shall be limited to a height of 10 feet. For any other zone, the height shall be limited to 15 feet. Other appurtenance structures shall be limited to a height of 15 feet in all zones.

1. Ground-mounted solar photovoltaic installations shall be effectively screened year-round:
   i. from all abutting properties in all residential zones;
   ii. from all abutting properties in residential use in all non-residential zones;
   iii. and from public and private ways in all residential districts.

Except for vehicular and pedestrian passageways and permitted signs, setback areas shall be modified only for additional screening. Where existing vegetation in the setbacks is insufficient to achieve year-round screening, additional screening shall be provided including, but not limited to, planting of dense vegetative screening, fencing, berms, natural ground elevations, land contouring, and/or placement of the solar panels and appurtenant structures on the site, all depending on site specific conditions.

Tree cutting within the required setback area shall not be permitted if it would reduce to any degree the effectiveness of the year-round screening.

2. If additional plantings are required for screening, a planting plan shall be submitted:

i. Showing the types, sizes and locations of material to be used which shall be subject to the approval of the Special Permit Granting Authority.

ii. Plantings shall be a minimum of six (6) feet in height at planting and staggered so as to fill the setback area and keep the arrays from view year round.

iii. Using a diversity of plant species native to New England for any screens and vegetative erosion controls. Use of exotic plants, as identified by the most recent version of the "Massachusetts Prohibited Plant List" maintained by the Massachusetts Department of Agricultural Resources, is prohibited. Cultivars of native plants are acceptable.

iv. At least 75% of the plantings shall consist of evergreens and shall be evenly spaced throughout the area of the setback area.

3. Planting of the vegetative screening shall be completed prior to connection of the installation. Plants shall be maintained and replaced if unhealthy by the owner/operator of the installation for the life of the installation.

4. The open area of the site shall be seeded with a pollinator mix and maintained as bird and insect habitat. Mowing is to be done as little as possible to retain a natural functioning of the landscape. Alternative vegetation or cover options may be proposed by the applicant in consideration of soil type and quality, subject to the approval of the Special Permit Granting Authority. Gravel areas that are well drained and stable do not require the addition of topsoil. Topsoil shall not be imported into any project sites unless there is a demonstrated engineering need and must be approved by the Special Permit Granting Authority prior to any introduction. The need to introduce topsoil may be grounds for permit denial.

5. Clearing of natural vegetation shall be limited to what is necessary for the construction, operation, and maintenance of the installation. Existing root structures, flat gravel areas, and topsoil shall be maintained to the maximum extent practicable.

6. Vegetation Management: Herbicides, pesticides, or chemical fertilizers shall not be used to manage vegetation at the ground mounted solar photovoltaic installation.

7. Ground surface areas beneath solar arrays and setback areas shall be pervious to maximize on-site infiltration of stormwater.

4.

1. The Special Permit Granting Authority shall discuss construction phasing with the designer of the installation as a means of mitigating erosion and sedimentation.

2. Habitat Fragmentation. A ground-mounted solar photovoltaic installation shall, to the greatest extent practicable, be clustered and located in or adjacent to areas of the site where the land has already been cleared of vegetation to avoid habitat fragmentation.

3. Invasive Species. The introduction of invasive species shall be prevented to the greatest extent practicable, during any construction or removal of a solar photovoltaic installation, through the use of current best practices.

4. A ground-mounted solar photovoltaic installation shall be considered the principal use of the parcel. Any parcel with an existing residence or other building may be approved for a solar installation with the provision that the residence or building be subdivided from the larger parcel prior to any construction

   of the solar installation. The parcel with the ground-mounted solar photovoltaic installation may not be subdivided for the purpose of development of the divided land until such time as the installation is decommissioned.

1. The design of the ground-mounted solar photovoltaic installations shall prevent reflected solar radiation or glare from becoming a public nuisance or hazard to adjacent buildings, roadways, or properties. Design efforts may include, but not be limited to, deliberate placement and arrangement on the site, anti-reflective materials, solar glare modeling, and screening in addition to required landscaping.

2. Any ground-mounted solar photovoltaic array installation proposed within a 5-mile radius of the Orange Airport shall be analyzed for glare utilizing any glare analysis compatible with FAA glare guidelines. [One such software package is Forge Solar, PV Planning and Glare Analysis.]

3. Ground-mounted solar photovoltaic installations shall not be approved unless the system design provides screening and buffers to protect scenic vistas and view sheds from residential uses, public streets and any waterways or water bodies.

4. A visual impact assessment shall be conducted that follows the protocols of the "Guidelines for Landscape and Visual Impact Assessment (Third Addition). Such assessment shall produce a map showing all areas within a 5-mile radius of the installation where the installation can be seen and where it cannot be seen.

   With input from the Planning Director, the applicant shall utilize additional tools to assess the visual impacts in critical areas of concern such as renderings, line-of-sight studies and/or two or three dimensional visualizations i.e. Photomontage, video montage, animation produced through Spatial Information Systems (SIS) and Geographic Information Systems (GIS).

5. All results of the visual impact assessment shall be taken into account in the design of the installation. When reviewing for compliance with section 3.24.3 Vegetated Buffer, Screening and Landscaping and scenic vistas in Section 3.24.5.3, the Special Permit Authority shall make a definitive judgment that the intent has been achieved.

3.24.5.6 Appurtenant Structures:

All appurtenant structures to ground-mounted solar photovoltaic installations shall be subject to reasonable regulations concerning the bulk and height of structures, lot area, setbacks, and 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 shall be shielded from view by vegetation approved by the Special Permit Granting Authority and/or joined or clustered to avoid adverse visual impacts.

3.24.5.7 Lighting:

Lighting of ground-mounted 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. All lighting shall comply with International Dark Sky Standards FSA Certification Requirements. There shall be no illumination without personnel on site.

3.24.5.8 Signs:

The following signs shall be required:

i. one that identifies the owner, the street address, provides a 24-hour emergency contact phone
ii. educational signs providing information about solar photovoltaic panels and the benefits of renewable energy.

Signs shall comply with Section 3.9, Sign Regulations.

Ground-mounted 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.

3.24.5.9 Utility Connections:

Utility connections, as determined by the Special Permit Granting Authority, shall be underground, depending on appropriate soil conditions, shape, and topography of the site and any requirements of the utility provider.

3.24.5.10

The need for fencing shall be determined by the applicant unless such fencing is needed to comply with Section 3.24.3 Vegetated Buffer, Screening and Landscaping, and/or as required per the National Electrical Code. If installed, all, shall be placed 6 inches off the ground to allow migration of wildlife, and shall have an Emergency Access System padlock or box at each gate.

3.24.5.11

1. Proposed stormwater management plans detailed below shall conform to the more stringent of any conditions or standards of this subsection and the Department of Environmental Protection's Massachusetts Stormwater Handbook, as amended.

2. All stormwater infrastructure shall be owned and maintained by the owner of the installation and shall be located on the same parcel as the solar installation.

3. All post-development stormwater, up to and including a 50-year return frequency 24-hour storm, shall be retained on the parcel site and infiltrated into the soil thru low impact development, retention and infiltration basins. At no time may stormwater be carried off site.

   Emergency overflows for storms in excess of the 50-year return frequency may be permitted provided it is demonstrated that no flooding or damage would be caused by the overflow. Attenuation of the discharge may be required as needed as determined by the Special Permit Granting Authority.

4. All pipes, catch basins and other materials utilized in the stormwater facilities shall be approved by the Athol Superintendent of Public Works, or his designee.

5. Stormwater Management Plan

i. The Stormwater Management Plan (four paper copies and one electronic copy in PDF format required) with the permit application shall contain sufficient information for the Special Permitting Granting Authority to evaluate the environmental impact and effectiveness of the measures proposed for retaining stormwater on the parcel site.

ii. The Stormwater Management Plan shall fully describe the project in drawings, narrative and calculations. It shall include:

   a. The site's existing and proposed topography
   b. A description and delineation of existing stormwater conveyances, impoundments, environmental resources on or adjacent to the site into which stormwater could flow;
   c. A delineation of 100-year flood plains, if applicable;
   d. Estimated seasonal high groundwater elevation in areas to be used for stormwater retention, detention, or infiltration;
   e. The existing and proposed vegetation and ground surfaces with areas and runoff coefficients for each;
   f.
   g.
   h. A drainage area map showing pre- and post-construction watershed boundaries, area and stormwater flow paths at a scale that enables verification of supporting calculations;
   i. A recharge area analysis that calculates pre-and post-project annual groundwater recharge rates on the parcel;
   j. A description and drawings of all components of the proposed stormwater management system;
   k.
   l. Soils information from test pits performed at the location of proposed Stormwater Management facilities, including soil descriptions, depth to seasonal high groundwater and depth to bedrock. Soils information will be based on site test pits logged by a Massachusetts Certified Soil Evaluator.

6. To ensure proper containment and stabilization of the site during the construction phase, a to control construction-related impacts, including erosion, sedimentation,

and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented. Such plan shall be developed to document compliance with Standard 8 of the Massachusetts Stormwater Handbook.

7. A Long -Term Stormwater Operation and Maintenance (O&M) Plan shall be developed and implemented to ensure that stormwater management systems function as designed. Such plan shall be developed to document compliance with Standard 9 of the Massachusetts Stormwater Handbook.

i. Stormwater management system(s) owners;
ii. The party or parties responsible for operation and maintenance of all aspects of the stormwater management system;
iii. The routine and non-routine maintenance tasks to be undertaken after construction is complete and a schedule for implementing those tasks;
iv. A plan that is drawn to scale and shows the location of all stormwater BMPs;
v. A schedule for routine inspections as well as a description of storms that would trigger immediate inspections following the storm;
vi. An inspection and maintenance log form
vii. An estimated stormwater operations and maintenance budget.
viii. Permission from the operator to allow agents of the Town of Athol to enter and inspect the premises to evaluate and ensure that the responsibility party complies with the Long-Term Stormwater Operation and Maintenance Plan requirements for each BMP.

8. During times of construction and post-construction where stormwater generated from the project area may inadvertently enter the public way, the developer (owner) shall be responsible for direct costs incurred by the town, including but not limited to stormwater related clean up, sanding, salting, street sweeping or other necessary management when required for the protection of public health and safety.

12.

Hazardous materials stored, used, or generated on site shall not exceed the amount for a Very Small Quantity Generator of Hazardous Waste as defined by the DEP pursuant to Mass DEP regulations 310 CMR 30.000 and shall meet all requirements of the DEP including storage of hazardous materials in a building with an impervious floor that is not adjacent to any floor drains to prevent discharge to the outdoor environment.

If any hazardous materials, including, but not limited to, lithium ion (storage batteries) are used within the solar electric equipment, then impervious containment areas capable of controlling and containing any release of hazardous materials to the environment and to prevent potential contamination of groundwater are required. A list of any hazardous materials proposed to be located on the site and a plan to prevent their release shall be provided to the Special Permit Granting Authority and Fire Chief.

13.

Noise generated by ground-mounted solar photovoltaic installations, cooling fans, inverters, associated equipment and machinery shall conform at a minimum to applicable state and local noise regulations,

including the DEP's Division of Air Quality noise regulations, 310 CMR 7.10 and 3.8.1.1 of the Athol Zoning Bylaw. Noise reduction shall be considered and incorporated as needed during the design phase of the installation including the location of the noise generator, shielding, noise cancellation, filtering, and noise suppression.

1. The right of abutting and neighboring landowners to live without undue disturbance from noise, traffic, lighting, fumes, dust, odor, glare, or stormwater runoff;
2. The adequacy of methods to store, handle, or dispose of wastes, including hazardous materials, to protect air, groundwater, and surface water pollution;
3. The protection of historical and natural environmental features on the site under review and in adjacent areas;
4. The adequacy of stormwater management systems to address non-point-source pollution.
5. Minimization of erosion of soil both during and after construction.
6. In the case of a residential zone location, the visual impact of the installation on its immediate abutters and the nearby neighborhood have been effectively neutralized through its location on the lot, appropriate design, landscaping and effective screening.
7. The location of the site and the system design provides effective screening and buffers to protect scenic vistas and view sheds from residential uses, public streets, recreational areas and any waterways or water bodies, and
8. The rural character of the general location has been maintained.

3.24.7 Site Control: The applicant shall submit documentation of actual or committed prospective access and control of the project site to allow for construction and the operation of the proposed ground-mounted solar photovoltaic installation.

3.24.8 Operation and Maintenance Plan: The installation owner or operator shall maintain the facility in good condition. The applicant shall submit a plan for the operation and maintenance of the ground-mounted solar photovoltaic installation along with a signed agreement with a maintenance company. This plan shall include measures for maintaining year-round safe access for emergency vehicle, snow plowing, storm water controls, and general procedures and a yearly schedule for the operation and maintenance of the facilities including fencing, and maintenance of landscaping.

3.24.9 Utility Notification: The applicant shall submit evidence satisfactory to the Special Permit Granting Authority that the utility company operating the electrical grid has been informed in writing of the intent to install a ground-mounted solar photovoltaic installation and intends to file an Interconnect Agreement in the future and that the utility company has responded in writing acknowledging the plan. Any off-grid system shall be exempt from this requirement.

3.24.10 Emergency Services: The applicant shall provide a copy of the project summary, operation and maintenance plan, electrical schematic, and site plan to the Athol Fire and Police Departments. The applicant and the installation operator shall cooperate with local and regional emergency services in developing an emergency response plan, which will ensure that emergency personnel have immediate, 24-hour access to the facility.

All means of shutting down the solar installation shall be clearly marked on the plan. The operator of the installation shall identify an official representative for public inquiries throughout the life of the installation.

The operation and maintenance plan required in Section 3.24.8 shall be periodically jointly reviewed and updated as necessary by the operator of the installation and the Athol Fire and Police Departments at a frequency to be determined by the Athol Fire Department. Safety personnel may request at any time that the operator provide onsite training in accessing and shutting down the operation of the installation.

The operator shall identify a qualified contact person who will provide assistance to local officials during an emergency. The operator shall update the contact information whenever there is a change in the contact person.

3.24.11 Annual Reporting: The owner or operator of a solar installation shall submit an annual report demonstrating and certifying compliance with the Operation and Maintenance Plan, the requirements of this bylaw, and approvals granted hereunder, including but not limited to continued management and maintenance of vegetation, compliance with the approved plans and any permit conditions, continuation of liability insurance, and adequacy of road access and functionality of stormwater management system. The annual report shall also provide information on the maintenance completed during the course of the year and the amount of electricity generated by the facility. The report shall be submitted to the Board of Selectmen, Special Permit Granting Authority, Fire Chief, and Conservation Commission (if a wetlands permit was issued) no later than 45 days after the end of the calendar year.

3.24.12 Modifications: All material modifications to the installation to be made after the issuance of the initial required building permit shall require approval of the Special Permit Granting Authority through a permit modification.

3.24.13 Discontinuance and Removal: Absent notice of a proposed date of decommissioning or written notice of extenuating circumstances, any ground-mounted solar photovoltaic installation not used for a period of one continuous year or more without written permission from the Special Permit Granting Authority, shall be considered to be discontinued and shall be removed by the owner.

Upon written request from the Building Inspector addressed to the contact address provided and maintained by the owner or operator as required, the owner or operator shall provide evidence to the Building Inspector demonstrating continued use of the installation. Failure to provide such evidence within thirty days of such written request shall be conclusive evidence that the installation has been discontinued.

The owner or operator or landowner shall physically remove the installation no more than 180 days after the date of discontinued operation. The owner or operator or landowner shall notify the Special Permit Granting Authority by certified mail of the proposed date of discontinued operations and submit plans for removal. Removal shall consist of:

1. Physical removal of all parts of and appurtenances of the installation including solar arrays, structures, equipment, security barriers and transmission lines.
2. [redacted] and disposal of remaining solid and hazardous wastes in accordance with state and federal waste disposal regulations applicable at the time of disposal.
3. Stabilization and revegetation of the site as necessary to minimize erosion and prevent impacts to wetlands, water courses or water bodies. The Special Permit Granting Authority may allow the owner or operator or landowner to leave landscaping or designated below grade foundations (provided they are filled in) in order to minimize erosion and disruption of existing vegetation. This requirement may be waived if the landowner submits a plan for re-use of the site.
4. Any portion of a site that was deforested for the installation shall be restored so as to encourage native tree growth, including the planting of seedlings, if necessary to establish growth.

As a condition of the Special Permit approval, the applicant and the landowner shall agree to allow entry to remove an abandoned or decommissioned installation. If the owner or operator or land owner fails to remove the installation in accordance with the requirements of this section, the Town of Athol shall have the right, to the extent it is otherwise duly authorized by law, to enter the property and physically remove the installation at a rate of 1.3 times the actual costs incurred. The Town of Athol shall use the financial surety as stipulated in the Financial Surety Section 3.24.14.

3.24.14 Financial Surety: The applicant of ground-mounted solar photovoltaic installations shall provide surety in the form of cash, certified bank check, escrow account or bond held by and for the Town of Athol to cover the cost of removal and stabilization of the site in the event the town must remove the installation and remediate the landscape, in an amount and form determined to be reasonable by the Special Permit Granting Authority, but in no event to exceed more than 130 percent of the cost of removal and stabilization costs as well as any compliance with the additional requirements set forth herein.

This surety will be due and payable at the issuance of the building permit. Proof of payment in the form of a receipt from the Town Treasurer will be shown to the Building Inspector before the permits are issued. Such surety will not be required for municipally- or state-owned facilities. The project applicant shall submit a fully inclusive estimate of the costs associated with removal and stabilization prepared by a licensed professional engineer. Such estimate shall be reviewed by the Town of Athol and adjusted as needed to reflect the opinion of the Town as to fair costs. The amount shall include a mechanism for calculating increased removal costs due to inflation.

As a condition of approval, an applicant shall bind itself to grant the necessary license or easement to the Town to allow entry to remove the structures and stabilize the site. The Town shall have the right but not the obligation to remove the facility.

3.24.15 Taxes or Payment in Lieu of Taxes: If the project would otherwise be exempt from the payment of personal or real property taxes, the applicant shall enter into a tax agreement or a payment in lieu of taxes (PILOT) agreement with the Town of Athol that provides an equivalent amount of tax revenue to the town as determined by the Board of Assessors. Any tax-related agreement or PILOT shall be approved by the Board of Assessors prior to the issuance of the Building Permit.

3.24.16 [redacted] The Special Permit Granting Authority may hire, at the expense of the applicant, consultants to review the plans submitted if it determines that independent expert review is appropriate for the interest of the neighborhood and/or the town. The applicant shall pay the

estimated cost of said expert(s), including all legal fees and publication fees, to the Town prior to any review being undertaken. No Building Permit shall be approved until the total costs of said review(s) have been paid by the applicant.

3.24.17

1. The Special Permit Granting Authority may waive or reduce strict compliance with any requirement of the Design Standards of this bylaw (unless noted otherwise in the bylaw), or any rules and regulations promulgated hereunder, where:

    a. such action is allowed by federal, state or local statutes and/or regulations;
    b. it is fully within the public interest;
    c. it is not inconsistent with the purpose and intent of this bylaw and the purposes and intent of the bylaw can still be met with the waiver or reduction due to special circumstances of the site
    d. and the full objectives of the bylaws can be met in an alternative manner.

2. The applicant shall submit a written request for any requested waiver at the time of the initial application. Such request shall be accompanied by an explanation or documentation supporting the waiver request and demonstrating that:

    a. strict application of the bylaws does not further the purposes or objectives of this bylaw,
    b. due to special circumstances of the site that the objectives of the bylaws can be met in an alternative manner and,
    c. such a waiver or reduction of the requirements will not derogate from the intent or purpose of the bylaw.

3. All waiver requests shall be discussed during a required a public hearing duly noted in a public agenda and shall require a two-thirds vote in favor to be approved. If the Special Permit Granting Authority deems additional time or information is required in the review of the waiver request, the Special Permit Granting Authority may continue the request for the waiver to a subsequent BPCD meeting.

3.24.18

The Special Permit Granting Authority may adopt, and from time to time amend, Rules and Regulations consistent with the provisions of this bylaw and G.L. c. 40A and other provisions of the General Laws, including the Subdivision Rules and Regulations of Town of Athol, Massachusetts, and shall file a copy of said Rules and Regulations with the Town Clerk. Said Rules and Regulations may provide for an application fee schedule for ground-mounted solar photovoltaic installation application submittals and methods for calculating the financial surety required under Section 3.24.14.

3.24.19

If the owner of the ground-mounted solar photovoltaic installation changes or the owner of the property changes, the special permit shall remain in effect, provided that the successor owner or operator assumes in writing all of the obligations of the special permit, site plan approval, and decommissioning plan. A new owner or operator of the ground-mounted solar photovoltaic installation shall notify the Special Permit Granting Authority and the Building Inspector/Zoning Enforcement Officer of such change in ownership or operator within thirty (30) days of the ownership change.

The special permit and all other local approvals for the ground-mounted solar array installation system would be void if a new owner or operator fails to provide written notification to Special Permit Granting Authority and the Building Inspector/Zoning Enforcement Officer in the required timeframe. Reinstatement of a void special permit, site plan approval and any other local approvals will be subject to the same review and approval processes for new applications under the Town of Athol Bylaws and Regulations.

3.24.20 Severability

If any provision of this bylaw is held invalid by a court of competent jurisdiction, the remainder of the bylaw shall not be affected thereby.

*or act in relation thereto.*

# G SAMPLE PILOT AGREEMENT

# AGREEMENT FOR PAYMENT IN LIEU OF TAXES

# FOR REAL PROPERTY AND PERSONAL PROPERTY

between

VH WEST BROOKFIELD, LLC (Developer)

and

THE TOWN OF WARE, MASSACHUSETTS (Town)

dated as of November 29 2016

AGREEMENT FOR PAYMENT IN LIEU OF TAXES FOR
REAL PROPERTY AND PERSONAL PROPERTY

THIS AGREEMENT FOR PAYMENT IN LIEU OF TAXES FOR REAL PROPERTY AND PERSONAL PROPERTY ("Agreement") is made and entered into as of November [ ], 2016, by and between VH West Brookfield, LLC, a Delaware limited liability company ("Developer") and the Town of Ware, a municipal corporation duly established by law and located in Hampshire County, Massachusetts (the "Town"). Developer and the Town are collectively referred to in this Agreement as the "Parties," and individually referred to as a "Party."

WHEREAS, Developer is a "generation company" engaged in the business of producing, manufacturing or generating electricity or related services or products, including but not limited to, renewable energy generation attributes for retail sale to the public, or a "wholesale generation company" engaged in the business of producing, manufacturing or generating electricity for sale at wholesale only, as such terms are defined or used in the Massachusetts General Laws Chapter 59, §38H(b), and Chapter 164, §1;

WHEREAS, Developer has leased from Peter E. and Mary M. Dudula ("Property Owner") approximately 18.11 acres of land located at 38 Gilbertville Road in Ware, Massachusetts, more particularly described on the attached Exhibit A (the "Property"), under the terms of a Solar Facility Land Lease, dated July 21, 2016 (the "Lease"), with an initial term of twenty-five (25) years, and Developer plans to build, own and operate a solar photovoltaic energy facility with an expected nameplate capacity (the "Capacity") of approximately 1.39 MW (DC) (the "Project"), on said Property, as such Project is more particularly described in Exhibit B, and has entered into a Special Permit and Decommissioning Cash Surety Agreement with the Town in connection with Developer's obligation to decommission the Project within six (6) months following termination of the Lease;

WHEREAS, it is the intention of the Parties that Developer make annual payments to the Town for the full term of this Agreement in lieu of all real and personal property taxes for the Project, in accordance with M.G.L. c.59, §38H(b) and other applicable laws and regulations, including the regulations of the Massachusetts Department of Revenue adopted in connection therewith;

WHEREAS, because Developer and the Town desire an accurate projection of their respective expenses and revenues with respect to the real and personal property that is taxable under law as a result of the Project, the Parties believe that it is in their mutual best interests to enter into this Agreement fixing the payments that will be made with respect to all taxable real and personal property for the Project for the term of the Agreement;

WHEREAS, the Parties intend that, during the term of the Agreement, except as otherwise provided herein, Developer will not be assessed for any statutory real and personal property taxes attributable to the Project to which it might otherwise be subjected under

Massachusetts General Law for the Project, and that this Agreement will provide for the exclusive payments in lieu of such real and personal property taxes that Developer (or any successor owner of the Project) will be obligated to make to the Town with respect to the Project during the term hereof, provided, however, that this Agreement does not affect any other taxes and payments that may be charged to and owed by the Developer or Property Owner to the Town except for the real and personal property taxes attributable to the Project; nor does this Agreement affect any other payments that may be legally owed by Developer or Property Owner to the Town, including, but not limited to, real property taxes for the Property, taxes for personal property other than the taxes attributable to the Project, and payments for services provided by the Town to the Project and the Property, including, but not limited to, water and sewer services, betterment assessments, and other payment obligations;

WHEREAS, notwithstanding the foregoing, it is not the intention of the Parties to remove any obligation of the Property Owner to pay the real property taxes on the Property, including the land upon which the Project is sited;

WHEREAS, it has been determined that the Project equipment, machinery and components described in Exhibit D constitute real and/or personal property for tax purposes, and are not part of the real property upon which they are installed;

WHEREAS, this Agreement does not apply to real property taxes for the Property, and this Agreement shall not impact the Town's ability to raise or lower real property taxes in the ordinary course of its tax assessment practices;

WHEREAS, the Town is authorized to enter into this Agreement with the Developer, provided the payments in lieu of real and personal property taxes over the life of the Agreement are expected at inception to approximate the real and personal property tax payments that would otherwise be determined under M.G.L. c.59 based upon the full and fair cash valuation of the real and personal property attributable to the Project; and Developer, throughout the term hereof, qualifies as a "generation company" or "wholesale generation company";

WHEREAS, this Agreement is subject to approval by the Town's Board of Selectmen and Town Meeting; and

WHEREAS, the Parties have reached this Agreement after good faith negotiations.

NOW THEREFORE, in exchange for the mutual commitments and other good and valuable consideration, the receipt and sufficiency of which are acknowledged, the parties agree as follows:

1. Payment in Lieu of Real and Personal Property Taxes. Developer agrees to make annual payments to the Town ("Annual Payments") in lieu of all real and personal property taxes attributable to the Project for the period commencing on the Completion Date (as defined below) and continuing for twenty (20) years from such date (the "Term"). The amount of each Annual

Payment shall be the amount arrived at by multiplying the number of megawatts of the Project's installed Capacity on the Completion Date by the Factor, defined below, subject to adjustment as set forth herein. The "Factor" shall be $14,000 per megawatt of the Project's installed Capacity on the Completion Date for the first year of the Term and shall increase by 2.0% annually thereafter, as reflected on the schedule attached hereto as Exhibit C. The "Completion Date" shall be the first date on which the Developer has received from the local electric utility written authorization to interconnect the Project to the utility's system and acceptance of the Project from the utility (to the extent required) and the Project has commenced commercial operation or when the Project is completed as determined by the building inspector. Each Annual Payment will be paid to the Town in four (4) equal quarterly installments (prorated for the first and last quarters of the term of this Agreement) on or before August 1, November 1, February 1 and May 1 of each fiscal tax year during the term of this Agreement and the Annual Payment amount and payment dates will be noted on quarterly bills issued by the Town to the Developer. Developer agrees that the Annual Payments in lieu of taxes under this Agreement will not be reduced on account of a depreciation factor or reduction in the Town's tax rate, or increased on account of an appreciation factor or increase in the Town's tax rate, which factors have been anticipated and are reflected in Exhibit C. The failure of the Town to deliver such a bill shall not relieve the Developer of its obligation to timely make payments required hereunder.

2. Changes In Capacity. To the extent that the Capacity of the Project is increased by Developer after the Completion Date, the remaining Annual Payments in lieu of taxes for real and personal property attributable to the Project will be increased as described in Paragraph 3 of this Agreement. Developer shall notify the Town of the Completion Date in writing within 30 days after the Completion Date has been achieved, and in such notification shall confirm the installed Capacity of the Project as of the Completion Date, which the Town may verify by visiting the Property or otherwise in accordance with paragraph 4 of this Agreement. Notwithstanding anything to the contrary in this Agreement, there shall be no reductions in annual payments for any reductions in capacity.

3. Calculation of Adjustment. To the extent that the installed Capacity of the Project exceeds 1.39 MW (DC) on the Completion Date or is increased by the Developer after the Completion Date, the remaining Annual Payments in lieu of taxes under this Agreement shall be increased by an amount equal to $14.00 (MW payment divided by 1,000) for each kW of any such excess or increase, as applicable. The Parties agree that this adjustment is designed to ensure that the annual payments in lieu of taxes approximate the full and fair cash valuation of the Project. Notwithstanding anything to the contrary in this Agreement, in the event Developer reduces the Capacity of the Project to less than .2 MW DC, the Town may terminate this Agreement and assess any and all real and personal property taxes in accordance with the Massachusetts General Laws. No increase in installed Capacity of the Project shall increase payments hereunder until the Project equipment, improvements or other property causing the increase in Capacity have been interconnected to the local utility and have begun generating electrical power.

4. Inspection and Verifications. The Town, its officers, employees, consultants and attorneys will have the right to periodically inspect the Project and meters used to measure the

energy generated by the Project on reasonable prior notice to Developer for the purpose of confirming and verifying the Capacity of the Project and compliance with this Agreement.

Attached to this Agreement as Exhibit D is a preliminary, itemized inventory prepared by Developer (the "Inventory") of the improvements, equipment and other property anticipated to be incorporated into the Project. Only property necessary or incidental to the production of electricity shall be included in the Inventory or Project. Notwithstanding anything to the contrary in this Agreement, the Project, and thus the Annual Payments hereunder, shall not include buildings (except for a single equipment storage shed for use in the Project, subject to advance approval of the Town).

Within sixty (60) days after the Completion Date, Developer shall provide the Town with an as-built description of the solar photovoltaic panels and inverters and other equipment in the Project, to the same level of detail as provided on Exhibit D, which shall be considered the "Inventory." Within thirty (30) days after the Town's receipt of such notification, the Parties will agree on an updated Inventory; in the event the Town does not respond during such period, it shall be deemed to have accepted the Inventory as provided by the Developer. In the event the Parties are unable so to agree in such 30-day period, the Town shall, at its sole election, reasonably determine the updated Inventory, or assess taxes for such portions of the Project that are not included in the Inventory in Exhibit D as if this Agreement did not exist. Developer will update the Inventory annually as of January 1 of each year, and an updated written Inventory, referred to as an Annual Inventory Update, will be provided to the Town on or before February 1 of each year. The Town, its officers, employees, consultants, agents and attorneys will have the right periodically, during normal business hours and upon reasonable advance notice to Developer, to inspect the Project and review documents in possession of Developer that relate to the Project and the Inventory to verify the Inventory and Developer's compliance with this Agreement.

The Developer shall promptly provide such information as may be reasonably requested by the Town from time to time to determine and verify the existence, condition, cost and valuation of any and all equipment or personal property constituting the Project and any additions, replacements, improvements and upgrades thereto. In addition to any other rights of inspection hereunder, the Town, its officers, employees, consultants and attorneys will have the right to periodically inspect the Project on reasonable advance notice to the Developer for any reasonable purpose, including verification of Capacity of the Project. During any such inspection the Town shall comply with the reasonable safety guidelines of the Developer. The Town, its officers, employees, consultants and attorneys shall also have the right to review and audit those documents in the possession of the Developer relating to equipment and/or personal property installed relevant to Exhibit D of this Agreement and capacity data to verify the Capacity of the Project.

5. Town Expenses. Developer shall contribute $3,500.00 to the Town for the legal costs associated with this Agreement. Such payment shall be made ten (10) days after execution of this Agreement.

6. Payment Collection. In addition to such rights and remedies available in this Agreement, all statutory rights and remedies available to the Town for the collection of taxes shall apply to the Annual Payments in lieu of taxes hereunder, including but not limited to, all rights and remedies provided in G.L. c.59 and G.L. c.60, and all such rights and remedies are hereby reserved notwithstanding anything to the contrary herein. The provisions of the General Laws, including but not limited to G.L. c.59 and G.L. c.60, will govern the establishment of liens and the collection of any payments in lieu of taxes provided for in this Agreement as though said payments were real or personal property taxes due and payable to the Town. Accordingly, for example, if and to the extent deemed necessary by the Town for assessment or collection of Annual Payments, the Project may, at the Town's election, be deemed personal property unintentionally omitted from annual assessment under G.L. c. 59, § 75, or "Real Property," as defined in G.L. c. 59, § 2A(a). All payments more than thirty (30) days past due shall accrue interest at 14 percent per annum until paid. Additionally, Developer shall pay reasonable attorneys' fees, court and other costs incurred by the Town in the collection of any unpaid amounts due under this agreement.

7. Tax Status. The Town agrees that during the term of this Agreement, the Town will not assess Developer or Property Owner for any real and personal property taxes attributable to the Project to which they might otherwise be subject under Massachusetts law in the absence of this Agreement, and the Town agrees that this Agreement will exclusively govern the payments of such taxes; provided, however, that this Agreement does not affect, and will under no circumstances preclude, the Town from assessing any other taxes, fees, charges, rates or assessments which Developer or Property Owner may be obligated to pay (except for the real and personal property taxes attributable to the Project), including, but not limited to, real estate and personal property taxes excluding those attributable to the Project, excise taxes on vehicles due pursuant to G.L. c.60A, betterments, fees, or charges for services provided by the Town to the Project or Property, including, but not limited to, water and sewer services.

8. Binding Effect; Assignment; Termination. This Agreement will be binding upon and inure to the benefit of the successors and assigns of the Developer as owner of the Project and tenant under the Lease and the provisions of this Agreement will run with the Project and the Property during the Term. This Agreement may not be assigned without the advance written approval of the Town, which approval shall not be unreasonably withheld or delayed. Notwithstanding the foregoing, Developer may assign this Agreement, without approval of the Town, for collateral purposes or to a new owner in the event the Project is sold or transferred, or to an entity who is also an owner of the Project, provided that it shall provide the Town with written notice of such assignment within 30 days of any such assignment, provided that Developer shall not sell or transfer the Project to a tax exempt entity without the advance written consent of the Town. Notwithstanding the foregoing or any other provision contained herein to the contrary, the Developer or its successors and assigns may terminate this Agreement in the event that (i) the Lease is terminated at any time for any reason or (ii) the Project ceases commercial operation and is decommissioned. Upon termination of this Agreement for any reason, the Project will thereafter be assessed and taxed as though this Agreement does not exist.

9. Statement of Good Faith. The Parties agree that the payment obligations established by this Agreement were negotiated in good faith in recognition of and with due consideration of the full and fair cash value of the Project, to the extent that such value is reasonably determinable as

of the date of this Agreement in accordance with G.L. c.59, §38H. Each Party was represented by counsel in the negotiation and preparation of this Agreement and has entered into this Agreement after full and due consideration and with the advice of its counsel and its independent consultants. The Parties further acknowledge that this Agreement is fair and mutually beneficial to them because it reduces the likelihood of future disputes over real and personal property taxes attributable to the Project, establishes tax and economic stability at a time of continuing transition and economic uncertainty in the electric utility industry in Massachusetts and the region, and fixes and maintains mutually acceptable, reasonable and accurate payments in lieu of taxes for the Project that are appropriate and serve their respective interests. The Town acknowledges that this Agreement is beneficial to it because it will result in mutually acceptable, steady, predictable, accurate and reasonable payments in lieu of taxes to the Town. Developer acknowledges that this Agreement is beneficial to it because it ensures that there will be mutually acceptable, steady, predictable, accurate and reasonable payments in lieu of taxes for the Project.

10. Notices. All notices, consents, requests, or other communications provided for or permitted to be given hereunder by a Party must be in writing and will be deemed to have been properly given or served upon the personal delivery thereof, via courier delivery service or otherwise. Such notices shall be addressed or delivered to the Parties at their respective addresses shown below. Developer shall be solely responsible to provide copies of any notices to Property Owner.

To: Developer:

VH West Brookfield, LLC
c/o Nautilus Solar Energy, LLC
396 Springfield Avenue
Summit, NJ 07901
Attn: James M. Rice

To: Town:

Board of Selectmen
Town of Ware
126 Main St # C
Ware, MA 01082

Any such addresses for the giving of notices may be changed by giving written notice as provided above to the other Parties. Notice given by counsel to a Party shall be effective as notice from such Party.

11. Applicable Law. This Agreement will be made and interpreted in accordance with the laws and regulations of the Commonwealth of Massachusetts, which are incorporated herein by reference. The Parties each consent to the jurisdiction of the Massachusetts courts or other applicable agencies of the Commonwealth of Massachusetts regarding any and all matters, including interpretation or enforcement of this Agreement or any of its provisions. The Parties each agree that service of process may be affected by certified mail, return receipt requested at

the addresses indicated in Paragraph 10 of this Agreement (Notices) (or such other address a Party may provide from time to time pursuant to Paragraph 10). Venue for all court actions brought hereunder shall be the state courts located in Hampshire or Worcester County Massachusetts.

12. Good Faith. The Parties shall act in good faith to carry out and implement this Agreement and to resolve any disputes between them.

13. Force Majeure. The Parties recognize that there is the possibility during the term of this Agreement that all or a portion of the Property or Project may be damaged or destroyed or otherwise rendered unusable due to unforeseeable events beyond the reasonable control of the Parties. These events are referred to as "Force Majeure." As used herein, Force Majeure includes, without limitation, the following events:

a. Acts of God, including floods, winds, storms, earthquake, fire or other natural calamity;

b. Acts of War or other civil insurrection or terrorism; or

c. Taking by eminent domain by any governmental entity of all or a portion of the Property or the Project.

If an event of Force Majeure occurs during the Term and as a result of such event of Force Majeure the Project is partially or wholly damaged or destroyed or otherwise rendered inoperable or unusable ("Damaged") but the Lease is not terminated, then for the period of time following the event of Force Majeure during which the Project is so Damaged, the Annual Payments hereunder will be eliminated or reduced accordingly. In addition and without limiting the foregoing, if an event of Force Majeure occurs during the term of this Agreement with respect to any portion of the Project that renders the Project unusable for the customary purpose of the production of electricity for a period of more than sixty (60) consecutive calendar days, then Developer may, at its election, notify the Town of the existence of this condition as well as of its decision whether or not to rebuild that portion of the Project so damaged or destroyed or taken. If Developer elects not to rebuild, then it may notify the Town in writing of its termination of this Agreement and the Project and Property will thereafter be assessed and taxed by the Town as though this Agreement does not exist.

14. Covenants/Warranties of Developer.

a. During the term of the Agreement, Developer will not voluntarily do any of the following:

1) Convey by sale, lease, or otherwise any interest in the leasehold premises or Property to any tax exempt entity or organization, including without limitation a charitable organization pursuant to G.L. c.59, §5, Clause Third or to any person or entity that is not a

"generation company" or "wholesale generation company" under G.L. c. 59, § 38H(b) or assign this Agreement to any person or entity that is not a "generation company" or "wholesale generation company" under G.L. c. 59, § 38H(b), or in a manner where such assignment would otherwise disqualify this Agreement under G.L. c. 59, § 38H (b);

2) Fail to pay the Town all amounts due hereunder when due in accordance with the terms of this Agreement;

3) Seek, for any reason, an abatement or reduction of any of the amounts assessed in accordance with the terms of this Agreement and Developer hereby waives during the full term of this Agreement any rights it may have otherwise had to seek such an abatement or reduction; or

4) Seek to amend or terminate this Agreement on account of the enactment of any new law or regulation or a change in any existing law or regulation the intent or effect of which is to fix the method for calculating PILOT payments for renewable energy facilities.

b. Developer represents and warrants:

1) It is a corporation or other business entity duly organized, validly existing and in good standing under the laws of the state in which it was formed, and if a foreign corporation, is registered with the Massachusetts Secretary of State, and has full power and authority to carry on its business as it is now being conducted.

2) This Agreement constitutes a legal, valid and binding obligation of Developer enforceable in accordance with its terms, except to the extent that the enforceability may be limited by applicable bankruptcy, insolvency or other laws affecting other enforcement of creditors' rights generally or by general equitable principles.

3) It has taken all necessary action to authorize and approve the execution and delivery of this Agreement.

4) None of the documents or information furnished by or on behalf of Developer to the Town in connection with negotiation and execution of this Agreement contains any untrue statement of a material fact or omits to state any material fact required to be stated therein, or necessary to ensure that the statements contained herein or therein, in the light of the circumstances in which they were made, are not misleading.

5) The person executing this Agreement on behalf of Developer has the full power and authority to bind it to each and every provision of this Agreement.

6) Developer is a "generation company" or "wholesale generation company" as those terms are used and defined in G.L. c.59, §38H(b) and G.L. c.164, §1.

7) Developer does not qualify for a manufacturing classification exemption pursuant to G.L. c. 59 §5 (16)(3).

15. Invalidity. The Parties understand and agree that this Agreement shall be void and that no portion of this Agreement shall be enforceable, if (a) this Agreement, or any material portion of this Agreement, is determined or declared by a court or agency of competent jurisdiction to be illegal, void, or unenforceable; (b) Developer is determined or declared to not be a "generation company" or "wholesale generation company" as those terms are used and/or defined in G.L. c.59 §38H (b), and G.L. c.164, §1; and/or (c) this Agreement has not been approved by Ware Town Meeting.

16. Termination by Town. Notwithstanding anything to the contrary in this Agreement, the Town may terminate this Agreement upon and effective after ten (10) days written notice to Developer if:

a.. The Developer fails to make payments required under this Agreement and such failure is not cured within thirty (30) days, unless the past due payment is received prior to the effective date of the termination, as set forth above;

b. The Developer has filed, or has had filed against it, a petition in Bankruptcy, or is otherwise insolvent;

c. The Project is permanently abandoned for six (6) consecutive months or more or the Capacity of the Project is reduced to .2 MW (DC) or less; and/or

d. The Developer otherwise materially breaches this Agreement and fails to cure such breach within sixty (60) days following notice of such failure received by Developer from Town.

17. Miscellaneous.

a. Subject to applicable laws and regulations, each Party will, from time to time hereafter, execute and deliver, or cause to be executed and delivered, such reasonable additional documents or instruments as the Party reasonably requests for the purpose of implementing or effectuating the provisions of this Agreement, including, without limitation, lender consent documents on customary terms and conditions requested by Developer and approved by the Town through its Board of Selectmen. The reasonable

costs of executing and delivering such documents or instruments shall be borne by the requesting Party.

b. This Agreement may be executed in several counterparts, each of which shall be an original, and all of which shall constitute but one and the same instrument.

c. The Parties agree that this is the entire, fully integrated Agreement between them with respect to payments in lieu of taxes for the Project, and that there are no third party beneficiaries to this Agreement.

18. Certification of Tax Compliance. Pursuant to G.L. c. 62C, § 49A, Developer by its duly authorized representative, certifies that it has have complied with all laws of the Commonwealth relating to taxes, reporting of employees and contractors, and withholding and remitting of child support.

19. Provisions Required by Law: Each and every provision of law and clause required by federal, state or local law to be inserted in this Agreement shall be deemed to be inserted herein and the Agreement shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision or clause is not inserted, or is not correctly inserted, then upon the request of any party the Agreement shall forthwith be amended to make such insertion or correction. In any event, this agreement shall be read and enforced as if it contains all provisions and clauses required by applicable federal, local and Massachusetts law.

20. Compliance with PILOT Statute. The Town and Developer shall timely comply with any recordkeeping, filing or other requirements mandated by the Massachusetts Department of Revenue in connection with the Department's implementation of the PILOT Statute.

21. Recording. This Agreement will be recorded by the Developer in the Hampshire County Registry of Deeds promptly following its execution.

[Signature Page to Follow]

Executed under seal by the undersigned as of the day and year first written above, each of whom represents that it is fully and duly authorized to act on behalf of and bind its principals.

TOWN OF WARE
BY ITS BOARD OF SELECTMEN:

DEVELOPER:

VH WEST BROOKFIELD, LLC

By: _____
James M. Rice [Office, Certificate of Vote]
Authorized Signatory

COMMONWEALTH OF MASSACHUSETTS

HAMPSHIRE, ss. November 29, 2016

Then personally appeared the above-named [NANCY J. TALBOT], Selectman of the Town of Ware Board of Selectmen, who proved to me by satisfactory evidence of identification, being (check whichever applies): ☒ driver's license or other state or federal governmental document bearing a photographic image, ☐ oath or affirmation of a credible witness known to me who knows the above signatory, or ☐ my own personal knowledge of the identity of the signatory, to be the person whose name is signed above, and acknowledged the foregoing instrument to be his/her free act and deed for the purposes stated therein, before me.

Mary L. Midura
Notary Public

MARY L. MIDURA
Notary Public
Commonwealth of Massachusetts
My Commission Expires
October 14, 2022

My Commission Expires:

State of New Jersey
~~COMMONWEALTH OF MASSACHUSETTS~~

Morris, ss. November 30, 2016

Then personally appeared the above-named [James M. Rice], Selectman of the Town of Ware Board of Selectmen, who proved to me by satisfactory evidence of identification, being (check whichever applies): ☐ driver's license or other state or federal governmental document bearing a photographic image, ☐ oath or affirmation of a credible witness known to me who knows the above signatory, or ☐ my own personal knowledge of the identity of the signatory, to be the person whose name is signed above, and acknowledged the foregoing instrument to be his/her free act and deed for the purposes stated therein, before me.

Helen H. Ashenfelter
Notary Public

My Commission Expires:

HELEN H. ASHENFELTER
NOTARY PUBLIC
STATE OF NEW JERSEY
MY COMMISSION EXPIRES MARCH 23, 2021

COMMONWEALTH OF MASSACHUSETTS

_____, ss. November , 2016

Then personally appeared the above-named [_____], Selectman of the Town of Ware Board of Selectmen, who proved to me by satisfactory evidence of identification, being (check whichever applies): □ driver's license or other state or federal governmental document bearing a photographic image, □ oath or affirmation of a credible witness known to me who knows the above signatory, or □ my own personal knowledge of the identity of the signatory, to be the person whose name is signed above, and acknowledged the foregoing instrument to be his/her free act and deed for the purposes stated therein, before me.

_____
Notary Public

My Commission Expires:

STATE OF NEW JERSEY

_____, ss. November __, 2016

Then personally appeared the above-named James M. Rice, Authorized Signatory for VH West Brookfield, LLC, who proved to me by satisfactory evidence of identification, being (check whichever applies): □ driver's license or other state or federal governmental document bearing a photographic image, □ oath or affirmation of a credible witness known to me who knows the above signatory, or □ my own personal knowledge of the identity of the signatory, to be the person whose name is signed above, and acknowledged the foregoing instrument to be his/her free act and deed for the purposes stated therein, before me.

_____
Notary Public

My Commission Expires:

EXHIBIT A Description of

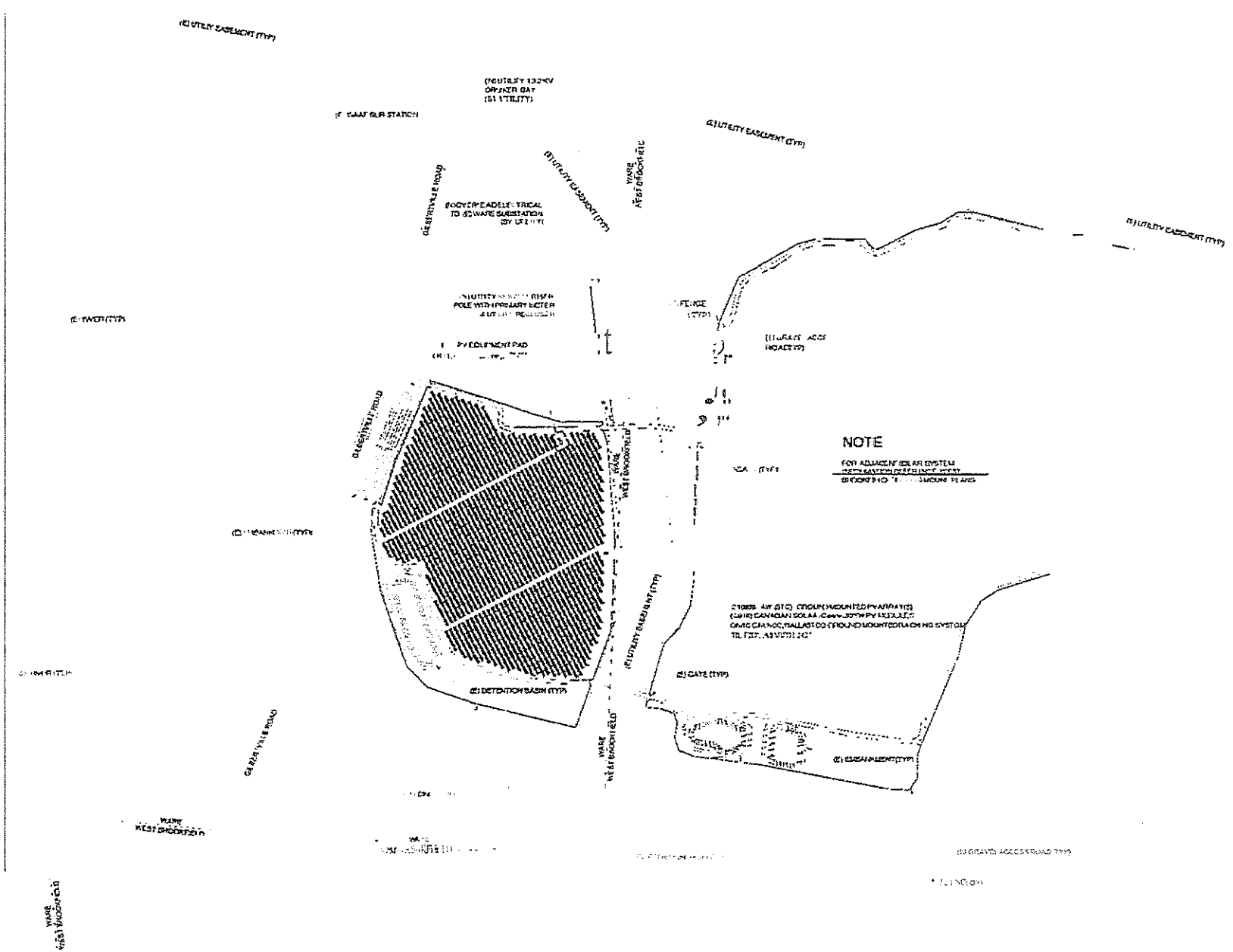
the Property

Approximately 18.11 acres of land shown on plan entitled "PLAN OF LAND Prepared For SEABOARD SOLAR HOLDINGS, LLC GILBERTVILLE ROAD WARE, MA.", prepared by Foresight Land Services, and filed in the Hampshire County Registry of Deeds in Plan Book 236, Page 84.

EXHIBIT B Description

of the Project

| | |
|---|---|
| Solar Facility Size: | 1.39 MW (DC) |
| Solar Facility Installation: | Ground mounted at a fixed tilt |
| Location: | Approximately 18.11 acres of land located at 38 Gilbertville Rd, Ware, MA 01082, which constitutes property owned by Landlord more particularly described on Exhibit A. |
| Solar Development Plan: | See map attached |




ELECTRICAL SITE PLAN - OVERALL

SCALE

WARE GROUND MOUNT
38 GILBERTVILLE ROAD
WARE, MA 01082

OVERALL

E-101

EXHIBIT C

Schedule of Factors to Calculate Annual Payments in lieu of Taxes
For Real and Personal Property Attributable to Project

| Contract Year | Factor | |
|---|---|---|
| 1 | $ | 14,000.00 |
| 2 | $ | 14,280.00 |
| 3 | $ | 14,565.60 |
| 4 | $ | 14,856.91 |
| 5 | $ | 15,154.05 |
| 6 | $ | 15,457.13 |
| 7 | $ | 15,766.27 |
| 8 | $ | 16,081.60 |
| 9 | $ | 16,403.23 |
| 10 | $ | 16,731.30 |
| 11 | $ | 17,065.92 |
| 12 | $ | 15,542.18 |
| 13 | $ | 17,407.24 |
| 14 | $ | 18,110.49 |
| 15 | $ | 18,472.70 |
| 16 | $ | 18,842.16 |
| 17 | $ | 19,219.00 |
| 18 | $ | 19,603.38 |
| 19 | $ | 19,995.45 |
| 20 | $ | 20,395.36 |

EXHIBIT D

Preliminary Inventory

| **Item** | **Description** | **# Units** |
|---|---|---|
| Photovoltaic Panels | Hanwha 330W | 4,230 |
| Inverters | Chint 1000V DC String Inverters for North America CPS-SC36-KTL | 26 |
| Transformers | 1)1MW Zig-Zag Grounding XFMR & 1) 1,000KVA Step Up XFMR | 1 + 1 |
| Racking | Magna Ground Mount Racking with Boysa.s Foundation | 118 4x9 tables |

# H ADDITIONAL RESOURCES

- SMART Regulation: https://www.mass.gov/solar-massachusetts-renewable-target-smart
- SMART Program Progress Updates: http://masmartsolar.com/
- Ineligible Lands under "SMART-ER" (for Category 2 & 3): https://bit.ly/SMARTLanduse
- Dual-Use Agriculture & Solar PV: Find more information on the UMass Clean Energy Extension website: https://ag.umass.edu/clean-energy/current-initiatives/solar-pv-agriculture
- Pollinator-Friendly Solar PV: Find more information about our certification program on our website: https://ag.umass.edu/clean-energy/current-initiatives/pollinator-friendly-solar-pv-for-massachusetts.
- DOER Model Solar Zoning Bylaw: https://www.mass.gov/files/documents/2016/08/nc/model-solar-zoning.pdf
- MAPC Solar Permitting and Zoning Bylaw Guidance: http://www.mapc.org/wp-content/uploads/2017/10/Solar-Permitting-and-Zoning-Bylaw-Guidance.pdf
- Solar PV Information for Municipalities: UMass Clean Energy Extension is collecting links to resources for municipalities regarding solar PV siting and planning on its website: https://ag.umass.edu/clean-energy/solar
- Fire Safety Training for Battery Systems: https://catalog.nfpa.org/Energy-Storage-and-Solar-Systems-Safety-Online-Training-P20882.aspx

## ENERGY STORAGE RESOURCES

**National Fire Prevention Association** - The 2018 NFPA 1 Fire Code is available for free viewing in read-only mode on the NFPA website. Unless already a NFPA member, you will need to create a free account and click on a URL received via e-mail to view the document. Energy storage systems are addressed in Chapter 52 of the code. https://www.nfpa.org/codes-and-standards/all-codes-and-standards/list-of-codes-and-standards/detail?code=1

**Fire Safety Training for Battery Systems** - NFPA's self-paced online training teaches the fire service how to safely deal with emergency situations involving high voltage commercial and residential energy storage and solar PV systems. Students receive a certificate upon their successful completion of the program. https://catalog.nfpa.org/Energy-Storage-and-Solar-Systems-Safety-Online-Training-P20882.aspx

**Massachusetts Comprehensive Fire Safety Code** - State regulation 527 CMR 1.00 governs fire safety in Massachusetts, and addresses any state-specific modifications to the NFPA 1 Fire Code. https://www.mass.gov/regulations/527-CMR-100-massachusetts-comprehensive-fire-safety-code

**Revisions to the Massachusetts Comprehensive Fire Safety Code** - Revisions to 527 CMR 1.00 are posted on this website. An advisory from the State Fire Marshall details changes to the code effective October 18, 2019 which are relevant to energy storage systems. https://www.mass.gov/service-details/massachusetts-fire-code

**Energy Storage Safety Collaborative** - The website for the Energy Storage Safety Collaborative provides codes and standards, publications, and research updates regarding Department of Energy and National Laboratory work on energy storage safety. https://www.sandia.gov/energystoragesafety-ssl

**Energy Storage Safety Guidelines** - Guidelines developed in 2016 by the Energy Storage Integration Council for distribution-connected energy storage systems. Available from EPRI. https://www.epri.com/research/products/000000003002008308

**Energy Storage System Guide for Compliance with Safety Codes and Standards** – A report by two National Laboratories (Pacific Northwest and Sandia) providing a review of current gaps, and what should be included in energy storage system standards and safety codes. https://www.sandia.gov/ess-ssl/publications/SAND2016-5977R.pdf

**Article ___** To see if the Town of Athol will vote to amend the Athol Zoning Bylaws, Article III, by deleting the existing Section 3.24, Ground-Mounted Solar Photovoltaic Installations, in its entirely and replacing with the following new text in its place.

3.24.1 Purpose

The purpose and intent of this bylaw is to provide standards for the placement, design, construction, operation, monitoring, modification and removal of ground-mounted solar photovoltaic installations which 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 placement, design, construction, operation, maintenance and/or repair, and environmental effects of ground-mounted solar photovoltaic installations.

This bylaw aims to balance the rights of landowners to use their land with the corresponding right of abutting and neighboring landowners to live without undue disturbance from noise, traffic, lighting, signage, smoke, fumes, dust, odor, glare, or storm water runoff. To maintain the character of the Town of Athol as a small New England village, this bylaw aims to retain the natural beauty, aesthetic appeal, historic value and scenic attraction of the Town for both residents and tourists.

3.24.2 Applicability

This bylaw applies to commercial and residential ground-mounted solar photovoltaic installations greater than 10,000 square feet proposed to be constructed after the effective date of this bylaw. This bylaw also pertains to physical modifications that materially alter the type, configuration or size of the installation. Square footage shall be calculated as follows:

i. The area within the security fence if a fence is provided, or
ii. All land area within a polygon (a plane shape-two dimensional-with straight sides) around the entire installation including all solar panels, all appurtenances including but not limited to buildings, storage areas, construction staging and lay-down areas, and transformers and poles, and parking along with a 15 foot perimeter area around all of the above or
iii. All areas of disturbed land, whichever is greater.

As defined in 3.24.2:

a) This bylaw does not pertain to ground-mounted solar photovoltaic installations installed on residential, commercial or industrial buildings. Those installations are subject to the State Building Code.
b) Ground-mounted solar photovoltaic installations less than or equal to 10,000 square feet shall only need a building permit and meet property setback requirements.
c) This bylaw does not pertain to solar carport canopies over existing rows of parking spaces. Such installations are considered Accessory Uses under Section 2.3 and are subject to the State Building Code.
d) This bylaw shall not apply to any ground-mounted solar photovoltaic installation being developed with the direct involvement of the Town of Athol at the former municipal landfill on West Royalston Road in Athol, MA.

3.24.3 Special Permit Granting Authority

applicable. The BPCD shall act as the Special Permit Granting Authority for such site plans with the entirety of the Town of Athol, including the Major Commercial Overlay District.

3.24.4.5 Professional Engineer

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

3.24.4.6 Required Documents to be deemed a complete application.

Pursuant to the site plan review process, the applicant shall also provide the following documents:

(a) A site plan showing:

i. Property lines and physical features, including both existing and proposed roads, for the project site at a scale of 1 inch equals 40 feet or such scale as may be approved by the Special Permit Granting Authority on standard 24" by 36" sheets and continuation on 8.5 " by 11" sheets as necessary for narrative;
ii. Blueprints or drawings of the solar photovoltaic installation showing the proposed layout of the system;
iii. 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;
iv. Proposed wattage of the solar photovoltaic installation solar power generation indicated in both dc (direct current) and ac (alternating current); a notation shall be included explaining the difference, e.g. loss in conversion from dc to ac;
v. Technical specification of the major system components to be used, including the PV panels, mounting system, and inverter and battery storage;
vi. Name, address, and contact information for proposed system installer (owner);
vii. Name, address, phone number and signature of the applicant, as well as all co-proponents or property owners;
viii. Proposed changes to the landscape of the site, grading, vegetation clearing and planting, exterior lighting, screening vegetation or structures;
ix. All existing lot lines, with size of each existing lot in acres or square feet, abutting land uses and location of structures within 500 feet of the site;
x. Names and addresses of all record owners within 500 hundred feet of all property lines along with a map showing the same;
xi. Locations and details of all security measures for the site;
xii. Documentation of all soils types, as identified on the United States Natural Resources Conservation Service soils survey, on all land involved with the project;
xiii. Provision of water including that needed for fire protection;
xiv. Location of all existing trail networks and woods roads, stonewalls, and historic features;
xv. All storm water plans as required in Section 3.24.5.11;
xvi. A calculation of slopes throughout the site as a percentage over consecutive 100-foot distances;
xvii. A buffer, screening and landscape plan as required in Section 3.24.3;
xviii. Location and approximate height of tree cover on the site at the time of application filing.
xix. Location, type of fixture, and height of any proposed lighting as well as documentation of Dark Sky Standards in accordance with Section 3.24.5.7;

xx. Location of equipment and construction staging area, and

(b) The name, contact information and signature of any agents representing the applicant;
(c) A glare analysis and proposed mitigation, if any, to minimize the impact on affected properties and roads, as well as the Orange airport in regards to the proposed solar panels as required in Section 3.24.5.5;
(d) Names and addresses of all record owners within 500 hundred feet of all property lines along with a map showing the same;
(e) Documentation by an acoustical engineer of the noise levels projected to be generated by both the installation and operation of the facilities as required in Section 3.24.5.13;
(f) Documentation of all soils types, as identified on the United States Natural Resources Conservation Service soils survey, on all land involved with the project;
(g) Documentation of actual or prospective access and control of the project site as required in Section 3.24.7;
(h) Visual impact analysis as required in Section 3.24.5.5;
(i) A complete list of chemicals, fuels, and any other hazardous materials to be used in both the construction and operation phase;
(j) A calculation of earthwork operations listing the amount of soil and rock to be imported or exported from the site. If any material is to be imported, such material shall clean and without contamination by hazardous substances or invasive species and must be obtained from a source(s) approved by the Athol DPW.
(k) Mitigation Plan as required in Section 3.24.5.4;
(l) A list identifying all off-site electrical system improvements necessary to the electrical grid to accommodate the power from the proposed installation and identification of what entity is paying for such improvements.

3.24.4.7 Waiver of Submittal Requirements: Upon the written request of the applicant with justification, the Special Permit Granting Authority may waive any of its submission requirements under unique site conditions. In addition, the Special Permit Granting Authority may request any additional data needed to render its decision.

3.24.5 Design Standards

1. Lot and Siting Requirements

i. Ground-mounted commercial solar photovoltaic array installations shall be permitted on parcels larger than 10 acres located within the RC zoning district and shall have a minimum lot frontage of 160 feet.

ii. Project generation size shall not exceed 5MW AC, nor shall the installation exceed 20 acres of fenced area, if fenced. If not fenced, the 20 acre area shall be calculated as the area within a polygon around the entire installation including all solar arrays, all appurtenances including but not limited to buildings, storage areas, construction staging and lay-down areas, transformers and poles along with a 15 foot perimeter area around all of the above

iii. No portion of a ground-mounted commercial solar photovoltaic array installation:

a. Shall be constructed on slopes greater than 10%, (measured over 100-foot intervals.) Cutting and filling to reduce natural slopes shall be prohibited except on short hollows, depressions or high spots. A waiver to increase the slope from 10% to 12% may be requested.

b. Shall be located on any parcel that contains 50% of Priority Habitat, Core Habitat or Critical Natural Landscape as defined in 225 CMR 20.00 Solar Massachusetts Renewable Target (SMART) Program, nor shall any trees be removed, or construction of structures, access roads or transmission lines may be placed in these designated areas.

iv. Ground-mounted solar photovoltaic installations shall be permitted only on previously disturbed areas* with an option of adding additional area through land clearing.

If less than 20 acres of contiguous or nearly contiguous previously disturbed area is not present on the lot, then land clearing of up to 5 acres of non-previously disturbed area is allowed for the installation. The acreage for clearing of non-previously disturbed area may be increased to a maximum of 10 acres with a proper waiver request from the developer and with the approval of the waiver request by the Board as authorized under Section 3.24.17. At least 50% of the area of any such installation, with or without a waiver, shall be located on previously disturbed areas.

*Previously disturbed areas shall mean land that meets any one of the following conditions at the time of adoption of these bylaws:

1. Land where the original grade and native material has been altered and/or removed for previous development.
2. Land where ALL existing vegetation has been removed for previous development.
3. Land utilized for sand, gravel or rock excavation.
4. Land that has been utilized for agricultural purposes.

Land that has been utilized for Silviculture*, whether under the Massachusetts Forest Cutting Practices Act (FCPA) or not, or for any of the activities exempt under the FCPA, shall not be considered previously disturbed areas.

*Definition from the UD Forest Service: Silviculture is the art and science of controlling the establishment, growth, composition, health, and quality of forests and woodlands to meet the diverse needs and values of landowners and society such as wildlife habitat, timber, water resources, restoration, and recreation on a sustainable basis

v. Location of the entrance road and all utility poles shall be located within the lot's frontage taking into consideration site lines for vehicular traffic and to lessen any visual impacts on abutters.

2. Setbacks and Height

i. For all zoning districts except for the Rural Single-Family Residential (RC) zoning district, ground-mounted solar photovoltaic installations must observe all yard requirements applicable to the principal structure as defined in Section 2.6, Intensity of Use Schedule. The Special Permit Granting Authority may increase these setbacks in these districts if they determine it to be appropriate.

ii. For the RC zone, setbacks shall be:

- 200 feet for front yard*
- 200 feet for side and rear yard*
- 200 feet from any perennial stream**
- 200 feet from any water body greater than 1 acre and less than 5 acres**
- 400 feet from the shoreline of any water body greater than 5 acres**

* The Special Permit Granting Authority may reduce the minimum setback distance for front, side and rear yards only in the RC District to a minimum of 75 feet as authorized per Section 3.24.17. In addition to the specifics of Section 3.24.17, the applicant shall also be required to submit written consent from all affected abutter(s) for any reduction in setbacks.

However, reduction of the setback on any frontage with a public road is not permitted whether the yard is a front, side or rear yard. The setback between properties of a single owner subdivided per Section 3.24.5.4.4 may be waived to no less than the minimum for existing setback requirements of the RC District per Section 2.6.

**The setbacks for perennial streams and water bodies between 1 and 5 acres are not subject to any waiver of distances under Section 3.24.13. Setbacks for water bodies greater than 5 acres are only allowed to be reduced through a waiver to a minimum distance of 300 feet as long as a natural wooded buffer is maintained, detailed stormwater plans show no further impact to abutting properties versus the 400-foot setback distance, water quality of runoff is not reduced and wildlife and fauna movement is not restricted with the reduced setback. No access roads or transmission lines may be constructed in the setbacks to any water body greater than 1 acre.

iii. All ground mounted photovoltaic panels in a residential zone shall be limited to a height of 10 feet. For any other zone, the height shall be limited to 15 feet. Other appurtenance structures shall be limited to a height of 15 feet in all zones.

3. Vegetated Buffer, Screening and Landscaping

1. Ground-mounted solar photovoltaic installations shall be effectively screened year-round:
   i. from all abutting properties in all residential zones;
   ii. from all abutting properties in residential use in all non-residential zones;
   iii. and from public and private ways in all residential districts.

Except for vehicular and pedestrian passageways and permitted signs, setback areas shall be modified only for additional screening. Where existing vegetation in the setbacks is insufficient to achieve year-round screening, additional screening shall be provided including, but not limited to, planting of dense vegetative screening, fencing, berms, natural ground elevations, land contouring, and/or placement of the solar panels and appurtenant structures on the site, all depending on site specific conditions.

Tree cutting within the required setback area shall not be permitted if it would reduce to any degree the effectiveness of the year-round screening.

2. If additional plantings are required for screening, a planting plan shall be submitted:

i. Showing the types, sizes and locations of material to be used which shall be subject to the approval of the Special Permit Granting Authority.

ii. Plantings shall be a minimum of six (6) feet in height at planting and staggered so as to fill the setback area and keep the arrays from view year round.

iii. Using a diversity of plant species native to New England for any screens and vegetative erosion controls. Use of exotic plants, as identified by the most recent version of the "Massachusetts Prohibited Plant List" maintained by the Massachusetts Department of Agricultural Resources, is prohibited. Cultivars of native plants are acceptable.

iv. At least 75% of the plantings shall consist of evergreens and shall be evenly spaced throughout the area of the setback area.

3. Planting of the vegetative screening shall be completed prior to connection of the installation. Plants shall be maintained and replaced if unhealthy by the owner/operator of the installation for the life of the installation.

4. The open area of the site shall be seeded with a pollinator mix and maintained as bird and insect habitat. Mowing is to be done as little as possible to retain a natural functioning of the landscape. Alternative vegetation or cover options may be proposed by the applicant in consideration of soil type and quality, subject to the approval of the Special Permit Granting Authority. Gravel areas that are well drained and stable do not require the addition of topsoil. Topsoil shall not be imported into any project sites unless there is a demonstrated engineering need and must be approved by the Special Permit Granting Authority prior to any introduction. The need to introduce topsoil may be grounds for permit denial.

5. Clearing of natural vegetation shall be limited to what is necessary for the construction, operation, and maintenance of the installation. Existing root structures, flat gravel areas, and topsoil shall be maintained to the maximum extent practicable.

6. Vegetation Management: Herbicides, pesticides, or chemical fertilizers shall not be used to manage vegetation at the ground mounted solar photovoltaic installation.

7. Ground surface areas beneath solar arrays and setback areas shall be pervious to maximize on-site infiltration of stormwater.

4. Mitigation

1. The Special Permit Granting Authority shall discuss construction phasing with the designer of the installation as a means of mitigating erosion and sedimentation.

2. Habitat Fragmentation. A ground-mounted solar photovoltaic installation shall, to the greatest extent practicable, be clustered and located in or adjacent to areas of the site where the land has already been cleared of vegetation to avoid habitat fragmentation.

3. Invasive Species. The introduction of invasive species shall be prevented to the greatest extent practicable, during any construction or removal of a solar photovoltaic installation, through the use of current best practices.

4. A ground-mounted solar photovoltaic installation shall be considered the principal use of the parcel. Any parcel with an existing residence or other building may be approved for a solar installation with the provision that the residence or building be subdivided from the larger parcel prior to any construction

   of the solar installation. The parcel with the ground-mounted solar photovoltaic installation may not be subdivided for the purpose of development of the divided land until such time as the installation is decommissioned.

5. Visual Impacts and Glare

   1. The design of the ground-mounted solar photovoltaic installations shall prevent reflected solar radiation or glare from becoming a public nuisance or hazard to adjacent buildings, roadways, or properties. Design efforts may include, but not be limited to, deliberate placement and arrangement on the site, anti-reflective materials, solar glare modeling, and screening in addition to required landscaping.

   2. Any ground-mounted solar photovoltaic array installation proposed within a 5-mile radius of the Orange Airport shall be analyzed for glare utilizing any glare analysis compatible with FAA glare guidelines. [One such software package is Forge Solar, PV Planning and Glare Analysis.]

   3. Ground-mounted solar photovoltaic installations shall not be approved unless the system design provides screening and buffers to protect scenic vistas and view sheds from residential uses, public streets and any waterways or water bodies.

   4. A visual impact assessment shall be conducted that follows the protocols of the "Guidelines for Landscape and Visual Impact Assessment (Third Addition). Such assessment shall produce a map showing all areas within a 5-mile radius of the installation where the installation can be seen and where it cannot be seen.

      With input from the Planning Director, the applicant shall utilize additional tools to assess the visual impacts in critical areas of concern such as renderings, line-of-sight studies and/or two or three dimensional visualizations i.e. Photomontage, video montage, animation produced through Spatial Information Systems (SIS) and Geographic Information Systems (GIS).

   5. All results of the visual impact assessment shall be taken into account in the design of the installation. When reviewing for compliance with section 3.24.3 Vegetated Buffer, Screening and Landscaping and scenic vistas in Section 3.24.5.3, the Special Permit Authority shall make a definitive judgment that the intent has been achieved.

3.24.5.6 Appurtenant Structures:

All appurtenant structures to ground-mounted solar photovoltaic installations shall be subject to reasonable regulations concerning the bulk and height of structures, lot area, setbacks, and 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 shall be shielded from view by vegetation approved by the Special Permit Granting Authority and/or joined or clustered to avoid adverse visual impacts.

3.24.5.7 Lighting:

Lighting of ground-mounted 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. All lighting shall comply with International Dark Sky Standards FSA Certification Requirements. There shall be no illumination without personnel on site.

3.24.5.8 Signs:

The following signs shall be required:

i. one that identifies the owner, the street address, provides a 24-hour emergency contact phone
ii. educational signs providing information about solar photovoltaic panels and the benefits of renewable energy.

Signs shall comply with Section 3.9, Sign Regulations.

Ground-mounted 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.

3.24.5.9 Utility Connections:

Utility connections, as determined by the Special Permit Granting Authority, shall be underground, depending on appropriate soil conditions, shape, and topography of the site and any requirements of the utility provider.

3.24.5.10 Fencing:

The need for fencing shall be determined by the applicant unless such fencing is needed to comply with Section 3.24.3 Vegetated Buffer, Screening and Landscaping, and/or as required per the National Electrical Code. If installed, such fencing shall be no more than 10 feet tall, shall be placed 6 inches off the ground to allow migration of wildlife, and shall have an Emergency Access System padlock or box at each gate.

3.24.5.11 Stormwater and Erosion Control

1. Proposed stormwater management plans detailed below shall conform to the more stringent of any conditions or standards of this subsection and the Department of Environmental Protection's Massachusetts Stormwater Handbook, as amended.

2. All stormwater infrastructure shall be owned and maintained by the owner of the installation and shall be located on the same parcel as the solar installation.

3. All post-development stormwater, up to and including a 50-year return frequency 24-hour storm, shall be retained on the parcel site and infiltrated into the soil thru low impact development, retention and infiltration basins. At no time may stormwater be carried off site.

   Emergency overflows for storms in excess of the 50-year return frequency may be permitted provided it is demonstrated that no flooding or damage would be caused by the overflow. Attenuation of the discharge may be required as needed as determined by the Special Permit Granting Authority.

4. All pipes, catch basins and other materials utilized in the stormwater facilities shall be approved by the Athol Superintendent of Public Works, or his designee.

5. Stormwater Management Plan

i. The Stormwater Management Plan (four paper copies and one electronic copy in PDF format required) with the permit application shall contain sufficient information for the Special Permitting Granting Authority to evaluate the environmental impact and effectiveness of the measures proposed for retaining stormwater on the parcel site.

ii. The Stormwater Management Plan shall fully describe the project in drawings, narrative and calculations. It shall include:

   a. The site's existing and proposed topography with contours at 2-foot intervals;
   b. A description and delineation of existing stormwater conveyances, impoundments, environmental resources on or adjacent to the site into which stormwater could flow;
   c. A delineation of 100-year flood plains, if applicable;
   d. Estimated seasonal high groundwater elevation in areas to be used for stormwater retention, detention, or infiltration;
   e. The existing and proposed vegetation and ground surfaces with areas and runoff coefficients for each;
   f. Calculations for the 2-year, 10 year and 50 year return period utilizing NCRS TR 55 Handbook. Pipe sizes, depth of flow, capacities and velocities shall be included;
   g. All pipes shall be a minimum 12-inch diameter.
   h. A drainage area map showing pre- and post-construction watershed boundaries, area and stormwater flow paths at a scale that enables verification of supporting calculations;
   i. A recharge area analysis that calculates pre-and post-project annual groundwater recharge rates on the parcel;
   j. A description and drawings of all components of the proposed stormwater management system;
   k. Hydrologic and hydraulic design calculations for the pre-development and post- development conditions for the design storms specified in the Massachusetts Stormwater Handbook;
   l. Soils information from test pits performed at the location of proposed Stormwater Management facilities, including soil descriptions, depth to seasonal high groundwater and depth to bedrock. Soils information will be based on site test pits logged by a Massachusetts Certified Soil Evaluator.

6. To ensure proper containment and stabilization of the site during the construction phase, a Stormwater Pollution Plan to control construction-related impacts, including erosion, sedimentation,

and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation, and pollution prevention plan) shall be developed and implemented. Such plan shall be developed to document compliance with Standard 8 of the Massachusetts Stormwater Handbook.

7. A Long -Term Stormwater Operation and Maintenance (O&M) Plan shall be developed and implemented to ensure that stormwater management systems function as designed. Such plan shall be developed to document compliance with Standard 9 of the Massachusetts Stormwater Handbook.

The Long-Term Stormwater Operation and Maintenance Plan shall at a minimum include:

i. Stormwater management system(s) owners;
ii. The party or parties responsible for operation and maintenance of all aspects of the stormwater management system;
iii. The routine and non-routine maintenance tasks to be undertaken after construction is complete and a schedule for implementing those tasks;
iv. A plan that is drawn to scale and shows the location of all stormwater BMPs;
v. A schedule for routine inspections as well as a description of storms that would trigger immediate inspections following the storm;
vi. An inspection and maintenance log form
vii. An estimated stormwater operations and maintenance budget.
viii. Permission from the operator to allow agents of the Town of Athol to enter and inspect the premises to evaluate and ensure that the responsibility party complies with the Long-Term Stormwater Operation and Maintenance Plan requirements for each BMP.

8. During times of construction and post-construction where stormwater generated from the project area may inadvertently enter the public way, the developer (owner) shall be responsible for direct costs incurred by the town, including but not limited to stormwater related clean up, sanding, salting, street sweeping or other necessary management when required for the protection of public health and safety.

12. Hazardous Materials:

Hazardous materials stored, used, or generated on site shall not exceed the amount for a Very Small Quantity Generator of Hazardous Waste as defined by the DEP pursuant to Mass DEP regulations 310 CMR 30.000 and shall meet all requirements of the DEP including storage of hazardous materials in a building with an impervious floor that is not adjacent to any floor drains to prevent discharge to the outdoor environment.

If any hazardous materials, including, but not limited to, lithium ion (storage batteries) are used within the solar electric equipment, then impervious containment areas capable of controlling and containing any release of hazardous materials to the environment and to prevent potential contamination of groundwater are required. A list of any hazardous materials proposed to be located on the site and a plan to prevent their release shall be provided to the Special Permit Granting Authority and Fire Chief.

13. Noise

Noise generated by ground-mounted solar photovoltaic installations, cooling fans, inverters, associated equipment and machinery shall conform at a minimum to applicable state and local noise regulations,

including the DEP's Division of Air Quality noise regulations, 310 CMR 7.10 and 3.8.1.1 of the Athol Zoning Bylaw. Noise reduction shall be considered and incorporated as needed during the design phase of the installation including the location of the noise generator, shielding, noise cancellation, filtering, and noise suppression.

3.24.6. Site Plan Review Criteria: In addition to the criteria under Section 3.18.8, the Special Permit Granting Authority shall consider the following matters during Site Plan Review and shall either approve or deny a special permit upon its determination that such matters have or have not been satisfactorily addressed:

1. The right of abutting and neighboring landowners to live without undue disturbance from noise, traffic, lighting, fumes, dust, odor, glare, or stormwater runoff;
2. The adequacy of methods to store, handle, or dispose of wastes, including hazardous materials, to protect air, groundwater, and surface water pollution;
3. The protection of historical and natural environmental features on the site under review and in adjacent areas;
4. The adequacy of stormwater management systems to address non-point-source pollution.
5. Minimization of erosion of soil both during and after construction.
6. In the case of a residential zone location, the visual impact of the installation on its immediate abutters and the nearby neighborhood have been effectively neutralized through its location on the lot, appropriate design, landscaping and effective screening.
7. The location of the site and the system design provides effective screening and buffers to protect scenic vistas and view sheds from residential uses, public streets, recreational areas and any waterways or water bodies, and
8. The rural character of the general location has been maintained.

3.24.7 Site Control: The applicant shall submit documentation of actual or committed prospective access and control of the project site to allow for construction and the operation of the proposed ground-mounted solar photovoltaic installation.

3.24.8 Operation and Maintenance Plan: The installation owner or operator shall maintain the facility in good condition. The applicant shall submit a plan for the operation and maintenance of the ground-mounted solar photovoltaic installation along with a signed agreement with a maintenance company. This plan shall include measures for maintaining year-round safe access for emergency vehicle, snow plowing, storm water controls, and general procedures and a yearly schedule for the operation and maintenance of the facilities including fencing, and maintenance of landscaping.

3.24.9 Utility Notification: The applicant shall submit evidence satisfactory to the Special Permit Granting Authority that the utility company operating the electrical grid has been informed in writing of the intent to install a ground-mounted solar photovoltaic installation and intends to file an Interconnect Agreement in the future and that the utility company has responded in writing acknowledging the plan. Any off-grid system shall be exempt from this requirement.

3.24.10 Emergency Services: The applicant shall provide a copy of the project summary, operation and maintenance plan, electrical schematic, and site plan to the Athol Fire and Police Departments. The applicant and the installation operator shall cooperate with local and regional emergency services in developing an emergency response plan, which will ensure that emergency personnel have immediate, 24-hour access to the facility.

All means of shutting down the solar installation shall be clearly marked on the plan. The operator of the installation shall identify an official representative for public inquiries throughout the life of the installation.

The operation and maintenance plan required in Section 3.24.8 shall be periodically jointly reviewed and updated as necessary by the operator of the installation and the Athol Fire and Police Departments at a frequency to be determined by the Athol Fire Department. Safety personnel may request at any time that the operator provide onsite training in accessing and shutting down the operation of the installation.

The operator shall identify a qualified contact person who will provide assistance to local officials during an emergency. The operator shall update the contact information whenever there is a change in the contact person.

3.24.11 Annual Reporting: The owner or operator of a solar installation shall submit an annual report demonstrating and certifying compliance with the Operation and Maintenance Plan, the requirements of this bylaw, and approvals granted hereunder, including but not limited to continued management and maintenance of vegetation, compliance with the approved plans and any permit conditions, continuation of liability insurance, and adequacy of road access and functionality of stormwater management system. The annual report shall also provide information on the maintenance completed during the course of the year and the amount of electricity generated by the facility. The report shall be submitted to the Board of Selectmen, Special Permit Granting Authority, Fire Chief, and Conservation Commission (if a wetlands permit was issued) no later than 45 days after the end of the calendar year.

3.24.12 Modifications: All material modifications to the installation to be made after the issuance of the initial required building permit shall require approval of the Special Permit Granting Authority through a permit modification.

3.24.13 Discontinuance and Removal: Absent notice of a proposed date of decommissioning or written notice of extenuating circumstances, any ground-mounted solar photovoltaic installation not used for a period of one continuous year or more without written permission from the Special Permit Granting Authority, or is operating at less than 25% of its nameplate capacity shall be considered to be discontinued and shall be removed by the owner.

Upon written request from the Building Inspector addressed to the contact address provided and maintained by the owner or operator as required, the owner or operator shall provide evidence to the Building Inspector demonstrating continued use of the installation. Failure to provide such evidence within thirty days of such written request shall be conclusive evidence that the installation has been discontinued.

The owner or operator or landowner shall physically remove the installation no more than 180 days after the date of discontinued operation. The owner or operator or landowner shall notify the Special Permit Granting Authority by certified mail of the proposed date of discontinued operations and submit plans for removal. Removal shall consist of:

1. Physical removal of all parts of and appurtenances of the installation including solar arrays, structures, equipment, security barriers and transmission lines.
2. Recycling of all possible materials and disposal of remaining solid and hazardous wastes in accordance with state and federal waste disposal regulations applicable at the time of disposal.
3. Stabilization and revegetation of the site as necessary to minimize erosion and prevent impacts to wetlands, water courses or water bodies. The Special Permit Granting Authority may allow the owner or operator or landowner to leave landscaping or designated below grade foundations (provided they are filled in) in order to minimize erosion and disruption of existing vegetation. This requirement may be waived if the landowner submits a plan for re-use of the site.
4. Any portion of a site that was deforested for the installation shall be restored so as to encourage native tree growth, including the planting of seedlings, if necessary to establish growth.

As a condition of the Special Permit approval, the applicant and the landowner shall agree to allow entry to remove an abandoned or decommissioned installation. If the owner or operator or land owner fails to remove the installation in accordance with the requirements of this section, the Town of Athol shall have the right, to the extent it is otherwise duly authorized by law, to enter the property and physically remove the installation at a rate of 1.3 times the actual costs incurred. The Town of Athol shall use the financial surety as stipulated in the Financial Surety Section 3.24.14.

3.24.14 Financial Surety: The applicant of ground-mounted solar photovoltaic installations shall provide surety in the form of cash, certified bank check, escrow account or bond held by and for the Town of Athol to cover the cost of removal and stabilization of the site in the event the town must remove the installation and remediate the landscape, in an amount and form determined to be reasonable by the Special Permit Granting Authority, but in no event to exceed more than 130 percent of the cost of removal and stabilization costs as well as any compliance with the additional requirements set forth herein.

This surety will be due and payable at the issuance of the building permit. Proof of payment in the form of a receipt from the Town Treasurer will be shown to the Building Inspector before the permits are issued. Such surety will not be required for municipally- or state-owned facilities. The project applicant shall submit a fully inclusive estimate of the costs associated with removal and stabilization prepared by a licensed professional engineer. Such estimate shall be reviewed by the Town of Athol and adjusted as needed to reflect the opinion of the Town as to fair costs. The amount shall include a mechanism for calculating increased removal costs due to inflation.

As a condition of approval, an applicant shall bind itself to grant the necessary license or easement to the Town to allow entry to remove the structures and stabilize the site. The Town shall have the right but not the obligation to remove the facility.

3.24.15 Taxes or Payment in Lieu of Taxes: If the project would otherwise be exempt from the payment of personal or real property taxes, the applicant shall enter into a tax agreement or a payment in lieu of taxes (PILOT) agreement with the Town of Athol that provides an equivalent amount of tax revenue to the town as determined by the Board of Assessors. Any tax-related agreement or PILOT shall be approved by the Board of Assessors prior to the issuance of the Building Permit.

3.24.16 Costs of Outside Expertise: The Special Permit Granting Authority may hire, at the expense of the applicant, consultants to review the plans submitted if it determines that independent expert review is appropriate for the interest of the neighborhood and/or the town. The applicant shall pay the

estimated cost of said expert(s), including all legal fees and publication fees, to the Town prior to any review being undertaken. No Building Permit shall be approved until the total costs of said review(s) have been paid by the applicant.

3.24.17 Waiver of Design Standards

1. The Special Permit Granting Authority may waive or reduce strict compliance with any requirement of the Design Standards of this bylaw (unless noted otherwise in the bylaw), or any rules and regulations promulgated hereunder, where:

    a. such action is allowed by federal, state or local statutes and/or regulations;
    b. it is fully within the public interest;
    c. it is not inconsistent with the purpose and intent of this bylaw and the purposes and intent of the bylaw can still be met with the waiver or reduction due to special circumstances of the site
    d. and the full objectives of the bylaws can be met in an alternative manner.

2. The applicant shall submit a written request for any requested waiver at the time of the initial application. Such request shall be accompanied by an explanation or documentation supporting the waiver request and demonstrating that:

    a. strict application of the bylaws does not further the purposes or objectives of this bylaw,
    b. due to special circumstances of the site that the objectives of the bylaws can be met in an alternative manner and,
    c. such a waiver or reduction of the requirements will not derogate from the intent or purpose of the bylaw.

3. All waiver requests shall be discussed during a required a public hearing duly noted in a public agenda and shall require a two-thirds vote in favor to be approved. If the Special Permit Granting Authority deems additional time or information is required in the review of the waiver request, the Special Permit Granting Authority may continue the request for the waiver to a subsequent BPCD meeting.

3.24.18 Rules and Regulations

The Special Permit Granting Authority may adopt, and from time to time amend, Rules and Regulations consistent with the provisions of this bylaw and G.L. c. 40A and other provisions of the General Laws, including the Subdivision Rules and Regulations of Town of Athol, Massachusetts, and shall file a copy of said Rules and Regulations with the Town Clerk. Said Rules and Regulations may provide for an application fee schedule for ground-mounted solar photovoltaic installation application submittals and methods for calculating the financial surety required under Section 3.24.14.

3.24.19 Ownership Changes

If the owner of the ground-mounted solar photovoltaic installation changes or the owner of the property changes, the special permit shall remain in effect, provided that the successor owner or operator assumes in writing all of the obligations of the special permit, site plan approval, and decommissioning plan. A new owner or operator of the ground-mounted solar photovoltaic installation shall notify the Special Permit Granting Authority and the Building Inspector/Zoning Enforcement Officer of such change in ownership or operator within thirty (30) days of the ownership change.