ZONING BYLAWS
RENEWABLE ENERGY SYSTEMS
TOWN OF SHIRLEY, MASSACHUSETTS

SECTION ____ LARGE-SCALE GROUND-MOUNTED SOLAR ELECTRIC GENERATING INSTALLATIONS

1. Purpose.

The purpose of this bylaw is to provide reasonable regulations pertaining to Large-Scale, Ground-Mounted, Solar Electric Generating Installations (see Section 3 - Definitions). These regulations shall include, but are not limited to, standards for the placement, design, construction, operation, monitoring, modification and removal of such installations that protect public health, safety and welfare; minimize impacts on residential properties and neighborhoods; protect natural resources, including wildlife habitat and corridors; and preserve scenic, historical, and cultural resources.

2. Applicability

This section applies to Large-Scale, Ground-Mounted, Solar Electric Generating Installations (Installations) occupying more than 1,000 square feet of land covered by solar panels including associated equipment and appurtenant structures. This section shall also pertain to physical modifications that materially alter the type, configuration, or size of Large-Scale Ground-Mounted Solar Electric Generating Installations or related equipment ("Material Modifications").

a) Large-Scale, Ground-Mounted, Solar Electric Generating Installations shall require a Special Permit and Site Plan Review in accordance with the Zoning Bylaws of the Town in addition to meeting the requirements of this Section. An Installation may be permitted on one or more adjacent parcels (including those separated by a roadway) up to a maximum of a 5 acre parcel of land in the Mixed Use District, Lancaster Road Commercial District, and Industrial Districts, as indicated in the chart below.

ZONING DISTRICT	ALLOWED
RR	No
R1	No
R2	No
R3	No
SV	No
NSV	No
GRW	No
MXD	Yes
I	Yes
LRC	Yes

b) Large-Scale, Ground-Mounted, Solar Electric Generating Installations covering more than 5 acres are not allowed anywhere in Town.

c) Small-scale (occupying 1,000 square feet or less) Ground-Mounted, Solar Electric Generating Installations which are an accessory structure to a residential or nonresidential use do not need to comply with this section, but are subject to Site Plan Review, require a building permit, and must comply with all applicable local, state and federal requirements, including but not limited to all applicable safety, construction, electrical, and communications requirements and other provisions of the Zoning Bylaws, such as setback requirements.

3. Definitions

Large-Scale Ground-Mounted Solar Electric Generating Installation (the Installation): A solar electric system that is structurally mounted on the ground and is not attached to a roof or wall of a structure and occupies more than 1,000 square feet of land.

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

Solar Electric System: All equipment, machinery, and structures that taken together are utilized to convert solar energy to electrical power.

4. Applicability of Neighborhood Covenants for all Ground Based Solar Projects

No Ground-Mounted Solar Electric Generating Installations of any size shall be installed in violation of covenants created by a Homeowner's Association, Condo Association, or other neighborhood governing structure which applies to a grouping of parcels of residential land.

Changes of Covenant, Use, Restrictions, or Designations for Large Scale Projects – No Large-Scale, Ground-Mounted, Solar Electric Generating Installations shall be permitted if any of the following are needed or true unless disclosed with the initial Site Plan Review or Special Permit Application:

a) Change in restrictive covenants either recorded or on the deed (MGL 184, Sec. 26)

b) Change in restrictions or conditions either recorded or on the deed (MGL 184, Sec. 26)

c) Change in conservation restriction in the form of a restriction, easement, covenant, condition, or right (MGL 184, Sec. 31)

d) Any change of use or designation of the parcel including but not limited to MGL 61, MGL 61A, or MGL 61B.

In the event any of the items are true, such notice must be submitted at the time of Site Plan Review or Special Permit Application. In the event of a change which allows the Town of Shirley a Right of First Refusal, the Town of Shirley's Board of Selectmen and all potential assignees must waive the Right of First Refusal before the Site Plan Review or the Special Permit Application will be considered complete and the required periods for holding a public hearing on such application will begin to run.

5. General Requirements for all Large-Scale Solar Ground-Mounted Solar Electric Generating Installations

The following requirements are common to all Large-Scale, Ground-Mounted, Solar Electric Installations.

a) **Compliance with Laws, Bylaws and Regulations**

The construction and operation of all Large-Scale, 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 of the installation shall require a building permit and shall be constructed in accordance with the Massachusetts State Building Code.

b) The emergency response guide shall be provided to the Shirley Fire Department along with emergency contact information. Keys to all gate locks shall be provided to the Shirley Fire Department.

c) Prior to commencement of construction activities, a complete copy of the Stormwater Pollution Prevention Plan (SWPPP) shall be provided to the Zoning Enforcement Officer, the Planning Board, the Conservation Commission, and emergency services. The SWPPP shall include the names, addresses, and contact information, including 24-hour emergency contact information for all construction-period project operators including the project owner and all project contractors and/or subcontractors. Changes and updates to the site operator contact information must be provided in writing to the Zoning Enforcement Officer within one business day of any changes/updates.

d) Prior to final approval by the Electrical Inspector and Zoning Enforcement Officer, an Operations and Maintenance (O&M) handbook shall be submitted to the Planning Board, the Zoning Enforcement Officer, the Conservation Commission, and emergency services, that includes the names, addresses, and contact information for the site owner and the site operator (if different), a description of emergency response measures including procedures for shutting down the Installation, a checklist of inspection items, a schedule for implementing routine and emergency maintenance activities, and a long term pollution prevention plan consistent with the requirements of the MassDEP Stormwater Management Standards.

   At such time that the responsible party(ies) transition or change, an updated O&M plan shall be submitted to the Planning Board, the Zoning Enforcement Officer, the Conservation Commission, and emergency services within five business days of the change.

e) Emergency shut-off procedures must be clearly indicated at each ingress point to the site. Each ingress point shall restrict access to authorized personnel only.

f) If earthwork activities require that material including, but not limited to, clean fill, loam, sand, and/or gravel be imported from off site, such material must be clean and without contamination by hazardous substances or invasive species and must be obtained from a source approved by the Shirley Department of Public Works. The applicant shall submit a detailed manifest describing the source of the material and shall provide the results of materials testing demonstrating that no hazardous substances or invasive species contaminate the material. If a manifest or materials testing information is not provided, the material must be removed and replaced at the applicant's expense.

g) Prior to final approval by the Building Inspector, all landscape areas must be complete in accordance with the Landscape Plan.

6. Site Plan Review

Large-Scale, Ground-Mounted, Solar Electric Generating Installations shall undergo Site Plan Review (see Section XII) by the Planning Board prior to construction, installation or modification as provided in this section.

a) General

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

b) Required Documents

The following documents shall be provided in addition to or in coordination with those required for Site Plan Review (see Section XII).

1. A Site Plan showing:
   All items required as part of section 7.5.3 of the Shirley Zoning Bylaw with the addition of the following.

   a. Proposed changes to the landscape of the site including grading, vegetation clearing and planting, screening, and new structures, including their height;

   b. Locations of 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 "Habitat of Potential Regional or Statewide Importance" also known as "Important Habitat" mapped by the DEP.

   c. Locations of local or National Historic Districts;

   d. 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;

   e. Blueprints or drawings of the solar electric 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;

   f. One- or three-line electrical diagram detailing the solar electric Installation, associated components, and electrical interconnection methods, with all National Electrical Code-compliant disconnects and overcurrent devices;

   g. Documentation of the major system components to be used, including the electric generating components, transmission systems, mounting system, inverter, etc.

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

   i. Name, address, phone number and signature of the property owners, the applicant, the developer, and any other party that produced material to support the Special Permit Application or the Site Plan;

   j. The name, contact information and signature of any agents representing the owner or applicant;

   k. Provision of water including that needed for fire protection; and

   l. Zoning district designation and zoning overlay(s) for the parcel(s) of land

comprising the project site (submission of a paper copy of a zoning map with the parcel(s) identified is suitable for this purpose);

m. An operation and maintenance plan (see Section 8a);

2. Proof of liability insurance;

3. Description of financial surety that satisfies Section 14c;

4. Sight line representation. A sight line representation shall be drawn from that portion of any public road within 300 feet of the solar electric generating installation that would have the clearest view of the proposed facility, and the closest facade of each residential building (viewpoint) within 300 feet of the highest point (visible point) of the solar electric generating installation. Each sight line shall be depicted in profile, drawn at one inch equals 40 feet. The profiles shall show all intervening trees and buildings;

5. Existing (before condition) and proposed (after condition) photographs. Each sight line shall be illustrated by one four-inch by six-inch color photograph of what can currently be seen from any public road within 300 feet of the solar electric generating installation. Each of the existing condition photographs shall have the proposed solar electric generating installation superimposed on it to show what will be seen from public roads if the solar electric generating installation is built;

6. Landscape plan that satisfies 8d; and

7. Documentation provided by a licensed professional acoustical engineer, approved by the Planning Board and paid for by the applicant, of projected noise levels to be generated by the installation.

7. Site Control

The Site Plan application shall include documentation of actual or prospective access and control of the project site sufficient to allow for construction and operation of the proposed solar electric installation.

8. Operation & Maintenance & Landscape Plans

a) Operation & Maintenance Plan
The Site Plan application shall include a plan for the operation and maintenance of the Large-Scale, Ground-Mounted, Solar Electric Generating Installation, which shall include measures for maintaining safe access to the installation, stormwater and vegetation controls, as well as general procedures for operational maintenance of the installation.

b) Landscaping and Buffering
Landscaping shall be provided and maintained in accordance with the Site Plan approved by the Planning Board and incorporated as part of the plans on which the Permit is based.

c) If a property owner (or designated representative) of a lot from which the proposed installation can be seen without obstruction requests a visual rendering of the proposed installation from a vantage point of their choosing on said lot, the applicant shall submit one as part of the Site Plan or Special Permit Review. The visual rendering must

accurately reflect horizontal and vertical scale of the installation, accessories, and landscape screening.

d) Landscaping shall be provided and maintained on the site to screen the Installation, the accessory facilities, and appurtenant structures as set forth below. Landscape screening shall be provided adjacent to:

1. Abutting properties where a front, side, or rear lot line of the Installation site adjoins (or is separated by a public way from) a residential district or an existing residential use, as follows :

a. A strip of land not less than one hundred (100) feet from such front, side, and rear lot line shall be provided as a landscape buffer.

b. Landscape screening shall consist of planting, including evergreens, the plantings to be of such height and depth as is needed and as determined by the Planning Board during site plan review to adequately screen from view the installation, accessories, appurtenant structures, and light sources.

c. Such strip shall contain a continuous screen of planting of vertical habit in the center of the strip not less than three (3) feet in width and six (6) feet in height to maintain a dense screen year round.

d. At least 75% of the plantings shall consist of evergreens and shall be evenly spaced along the length of the buffer strip.

e. In lieu of continuous planting, a solid brick, stone or wood fence of a design approved by the Planning Board, or a planted earthen berm of a design approved by the Planning Board may be established and maintained with plantings in an amount no less than 20 % of the amount required above.

f. Removal of healthy trees over five (5) inches in diameter at breast height (dbh) shall be minimized in the buffer strip to the maximum extent practicable. Any such trees as are removed shall be replaced. New or replacement trees must be at least two (2) inches dbh.

g. All landscaped areas including, but not limited to walls and fences, shall be properly maintained. Plantings that die shall be replaced within one growing season by the property owner. Plantings shall be maintained in accordance with the Site Plan for the duration of the Installation.

2. Abutting public ways, in addition to the landscaping in front and side yards mentioned above, as follows:

a. Landscape screening shall consist of planting, including evergreens, the plantings to be of such height and depth as is needed and as determined by the Planning Board during site plan review to screen adequately from view any unshielded light source, generated or reflected, either inside or outside.

9. Utility Notification

No Large-Scale, Ground-Mounted, Solar Electric Generating Installations shall be constructed until evidence has been given to the Planning Board that the utility company

that operates the electrical grid where the installation is to be located has been informed of the solar electric installation owner or operator's intent to install an interconnected facility. Off-grid systems shall be exempt from this requirement.

10. Dimension and Height Requirements

a) Setbacks

For Large-Scale Ground-Mounted Solar Electric Generating Installations, front, side and rear setbacks and setbacks from property lines shall be as follows:

1. Front yard: The front yard depth shall not be less than 200 feet.

2. Side yard. Each side yard shall have a depth of at least 100 feet.

3. Rear yard. The rear yard depth shall not be less than 100 feet.

4. The front, side, and rear yard setbacks shall include the landscape buffer.

The required setback areas shall not be included in the maximum acre calculations for Ground-Mounted, Solar Electric Generating Installations.

b) Appurtenant Structures
All appurtenant structures to Large-Scale, Ground-Mounted, Solar Electric Generating Installations shall be subject to the Town's Zoning Bylaw requirements concerning the bulk 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, fencing, transformers, and substations, shall be architecturally compatible with each other. Structures shall be screened from view by vegetation and/or joined or clustered to avoid adverse visual impacts.

c) Height of Structures
The height of any structure associated with a Large-Scale, Ground-Mounted, Solar Electric Generating Installation shall not exceed 15 feet. The height of any solar panel from ground level shall not exceed 10 feet.

11. Design and Performance Standards

a) Lighting
Outdoor lighting including lighting on the exterior of a building or lighting in parking areas, shall be arranged to minimize glare and light spilling over the neighboring properties. Except for low level intensity pedestrian lighting, other lighting shall be designed and located so that:

1. The luminaire (LED) has an angle of cutoff less than 76 degrees;

2. A line drawn from the height of the luminaire (LED) along the angle of cutoff intersects the ground at a point within the development site;

3. The bare light bulb, lamp or light source is completely shielded from direct view at any point five feet above the ground on neighboring properties or streets.

4. Lighting shall be directional to preclude light pollution of neighbors or the night sky and shall be "Dark Sky" compliant and meet International Dark Sky FSA certification requirements.

5. The owner/operator shall be responsible for maintenance of lighting systems. Lighting shall not be kept on after 9:00 p.m. unless there is an emergency or is required for safety purposes as determined by the Shirley Emergency Management Director.

b) Signage

Signs on Large-Scale Ground-Mounted, Solar Electric Generating Installations shall comply with all applicable requirements of the Zoning Bylaws. A sign shall be required to identify only the owner and provide a 24- hour emergency contact phone number.

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

c) Utility Connections

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

d) Roads

Access roads shall be constructed to minimize grading, removal of stone walls or trees and minimize impacts to environmental or historic resources as approved by the emergency services departments in the Town of Shirley (e.g., Fire, Police and DPW).

e) Control of Vegetation

Herbicides may not be used to control vegetation at the solar electric Installation. Mowing and grazing underneath the solar array are possible alternatives.

f) 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 MassDEP 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 Planning Board and Fire Chief. The use of Cadmium Teluride solar panels are prohibited in the Town of Shirley.

g) Noise

Noise generated by Large-Scale, Ground-Mounted, Solar Electric Generating Installations and 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. In addition, for the purposes of this bylaw, a source of sound will be considered in violation of this bylaw if the source:

1. Increases the broadband sound level by more than 5 db(A) above the pre-construction ambient noise level; increases the broadband sound level by more than 5db(C) above the pre-construction ambient noise level; produces a "pure tone" condition, when an octave band center frequency sound pressure level exceeds the two (2) adjacent center frequency sound pressure levels by three (3) decibels or more; or

2. Results in sound or noise levels greater than 30 dBA. Sound levels must comply with the above stated criteria, at both the property line and at the nearest inhabited residence. In addition, the said criteria shall be measured at any property line that is subject to sound elevations higher than ambient sound as a result of higher or lower topography in the opinion of the applicant's acoustical engineer. "Ambient" is defined as the background A-weighted sound level that is exceeded 90% of the time measured during the quietest part of the day or night. All testing required by this bylaw shall be done by a licensed professional acoustical engineer chosen by the Planning Board and paid for by the applicant. All testing shall be done in accordance with the professional standards of the appropriate accrediting agencies.

h) Visual Impacts
The installation including all accessories and appurtenant structures 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 to screen abutting residential properties, whether developed or not. Siting shall be such that the view of the solar electric generating installation from other areas of Town shall be as minimal as possible, in the judgment of the Planning Board.

12. Safety and Environmental Standards

a) Emergency Services
A copy of the project summary, electrical schematic, and Site Plan shall be provided to the local Fire Chief. The owner or operator shall cooperate with local emergency services to develop an emergency response plan. All means of shutting down the solar electric installation shall be clearly marked. A responsible person shall be identified for public inquiries throughout the life of the installation.

b) Land Clearing, Soil Erosion and Habitat Impacts
The facility shall be designed to minimize impacts to agricultural land and shall be compatible with continued agricultural use to the maximum extent possible. The facility shall be designed to minimize impacts to environmentally sensitive land. Clearing of natural vegetation shall be limited to what is necessary for the construction, operation and maintenance of the Large-Scale, Ground-Mounted, Solar Electric Installation or otherwise prescribed by applicable laws, regulations, and bylaws. In no event shall clear cutting of forest exceed 5 acres. The design shall minimize the use of concrete and other impervious materials to the maximum extent possible. Locating Large-Scale Ground-Mounted Solar Electric Generating Installations on grades in excess of 15% shall be avoided to the maximum extent feasible.

c) Habitat Impacts
Large-Scale, Ground-Mounted, Solar Electric Generating Installations shall not be located on Permanently Protected Open Space or Priority Habitat and BioMap 2 Critical

Natural Landscape Core Habitat areas mapped by the Natural Heritage and Endangered Species Program (NHESP) and shall be designed to minimize impacts to "Habitat of Potential Regional or Statewide Importance" also known as "Important Habitat" mapped by the DEP to the maximum extent feasible.

13. Monitoring, Maintenance and Reporting

a) Solar Electric Generating Installation Conditions
The facility shall be maintained in good condition. Maintenance shall include, but not be limited to, painting, structural repairs, and maintaining the integrity of security measures. Site access shall be maintained to a level acceptable to the local Fire Chief and Emergency Management Director. The property owner and the owner/operator of the facility shall together be responsible for the cost of maintaining the solar electric generating Installation and any access road(s).

b) Modifications
All Material Modifications to a solar electric generating Installation made after issuance of the required building permit shall require approval by the Planning Board.

c) Annual Reporting
The Annual Report, which certifies compliance with the requirements of this bylaw and the approved site plan, including control of vegetation, noise standards, and adequacy of road access shall be submitted to the Board of Selectmen, Planning Board, Fire Chief, Emergency Management Director, Building Inspector, Board of Health and Conservation Commission (if a Wetlands Permit was issued) no later than 45 days after the end of the calendar year. The Annual Report shall also provide information on the maintenance completed during the course of the year, the amount of electricity generated by the facility, and the amount of surety available for decommissioning or indemnification (see Section 14c).

14. Abandonment, Decommissioning, Financial Surety & Indemnification

a) Removal Requirements
Any Large-Scale, Ground-Mounted, Solar Electric Generating Installation which has reached the end of its useful life or has been abandoned consistent with Section 14b of this bylaw, shall be removed. The owner or operator shall physically remove the installation no more than 150 days after the date of discontinued operations. The Planning Board shall be notified by certified mail of the proposed date of discontinued operations and plans for removal. Decommissioning shall consist of:

1. Physical removal of all Large-Scale, Ground-Mounted, Solar Electric Generating Installations, structures, equipment, security barriers and transmission lines from the site.
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 as approved by Planning Board. The Planning Board may allow the owner or operator to leave landscaping or designated below-grade foundations in order to minimize erosion and disruption to vegetation.

b) Abandonment
Absent notice of a proposed date of decommissioning or written notice of extenuating

circumstances, the solar electric installation shall be considered abandoned when it fails to operate for more than one year without the written consent of the Planning Board. Upon written request from the Building Inspector addressed to the contact address provided and maintained by the owner and operator as required above, the owner or operator shall provide evidence to the Building Inspector demonstrating continued use of the installation. Failure to provide such evidence within thirty (30) days of such written request shall be conclusive evidence that the installation has been abandoned. I If the owner or operator of the Large-Scale, Ground-Mounted, Solar Electric Generating Installation fails to remove the installation in accordance with the requirements of this section within 150 days of abandonment or the proposed date of decommissioning, the Town retains the right, after the receipt of an appropriate court order, to enter and remove an abandoned, hazardous or decommissioned Large-Scale, Ground-Mounted, Solar Electric Generating Installation. As a condition of Site Plan or Special Permit approval, the applicant, Installation owner, and/or landowner shall agree to allow entry to remove an abandoned or decommissioned installation. The Town's cost for the removal will be charged to the property owner in accordance with the provisions of M.G.L. 139, Section 3A as a tax lien on the property.

c) Financial Surety

A form of surety shall be provided and thereafter maintained, either through an escrow account, bond or other form of surety approved by the Planning Board to cover the cost of removal in the event the town must remove the installation and remediate the landscape, in an amount and form determined to be reasonable by the Planning Board, but in no event to exceed more than 125 percent of the cost of removal and compliance with the additional requirements set forth herein, as determined by the project proponent and the Town. Such surety will not be required for municipal or state-owned facilities. A fully inclusive estimate of the costs associated with removal, prepared by a licensed Professional Engineer shall be submitted. The amount shall include a mechanism for calculating increased removal costs due to inflation. The owner shall increase or replenish the surety as necessary to maintain an adequate amount, as determined by the Planning Board in accordance with the requirements of this bylaw.

d) Indemnification

The owner/operator shall indemnify and hold harmless the Town of Shirley and/or any of its citizens from any and all liabilities, losses and/or damages, including reasonable attorney fees, resulting from the failure of the owner/operator to comply with the terms of this by-law and/or negligence in the operations and maintenance of any structures built in accordance with it. Any surety provided for in this by-law shall be available for the aforementioned indemnification.

15. Severability.

The provisions of this bylaw are severable, and the invalidity of any section, subdivision, subsection, paragraph or other part of this bylaw shall not affect the validity or effectiveness of the remainder of this bylaw. For any provision of this bylaw that conflicts with another state or local bylaw, the most restrictive provision shall apply.